

FOSTERING CLIMATE CHANGE AND FOOD LITERACY THROUGH A CLIMATE- FRIENDLY FOOD SYSTEM TOOLKIT

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Practitioner Summary

Project Background


UBC’s Climate Action Plan 2030 set the goal of creating a toolkit to engage and educate UBC students with Climate Friendly Food Systems.

Objective

Enhance climate and food system literacy within the UBC campus community by providing effective resources, tools, and knowledge and in turn encourage positive climate and sustainability efforts.

Methodology

Community-Based Action Research



Methods

Literature Review
Assess common approaches

Focus Groups
Hear from the community

Key Findings

- 1 Main barriers to sustainable eating are culture, affordability, and knowledge
- 2 Students prefer messages that use collective language
- 3 Students prefer fun visual designs that appear to be made by other students
- 4 Avoid reactance to ensure messages are well recieved

Conduct additional research
Get student feedback on the toolkit
Update the toolkit regularly

Next Steps

Executive Summary

Climate change and the lack of food literacy have become increasingly important issues in recent years, and researchers have found that the environmental impacts of climate change on a global scale will affect human health and wellbeing (Filho et al., 2023). There is a positive correlation between global human health problems and more extreme weather conditions in the last decade (Keatinge & Donaldson, 2004). The goal of moving to a sustainable food system is recognized as a viable solution to global environmental and climate problems (Feenstra, 2002). According to Park's team (2020), achieving a sustainable food system is essential for mitigating climate change by reducing greenhouse gas emissions and conserving resources (Hunter et al., 2020). Additionally, participants within this system must be empowered with knowledge in order to make informed choices that benefit both their health and the environment (Park et al., 2020). The implementers of this goal are all those involved in the food system, and the broad and effective promotion of food literacy skills is a cornerstone of achieving this goal.

An effective toolkit holds significant value; serving as a guide, it consolidates best practices and offers actionable steps, enabling users to transition from awareness to impactful action as well as spreading practical knowledge (Assessment, 2016). The purpose of our project is to create a Climate Friendly Food Systems toolkit that is characterized by its professionalism and effectiveness. The professionalism of the toolkit is not only supported by the professional design and layout coupled with standardized language and terminology. And the effectiveness of this toolkit is supported not only by expert opinions but also the shared daily experience of the general public from our focused group.

An effective and widely used toolkit can be inspirational as well as informative for the user. For example, the use of a toolkit to provide information on food waste disposal can position the user's role and boost their agency within a sustainable food system (Assessment, 2016). The objective of creating this toolkit is to increase UBC student's knowledge of what constitutes a climate friendly food system, and provide them with tangible ways to implement this knowledge in their own lives. Eventually the toolkit aims to inspire and expand the role each user plays in a sustainable food system.

Utilizing a focus group interview methodology offers numerous advantages. Diverse perspectives are gathered through dynamic and interactive discussions, providing a comprehensive understanding of complex issues. At the same time, focus groups are particularly effective in identifying priorities, exploring attitudes and behaviours, and building a sense of community among participants (Rabiee, 2004). Our team has conducted focus groups with the SEEDS CFFS Action Team, student groups focused on food system sustainability, and students from the wider student body. We have used these sessions to understand the most effective ways to present content surrounding climate change, food systems, and individual action, within the UBC campus context. This aligns with our approach of using Community Based Action Research (CBAR) methodology in our project. CBAR involves conducting participatory research specific to a certain location, with community participation at all stages of research. (Gullion & Tilton, 2020) Through secondary sources, we explored the barriers to sustainable behaviour changes, including the use of framing language, the concept of reactance, and various sociocultural factors. Our primary and secondary findings were applied to the toolkit deliverable, which includes the digital handbook resource (Appendix A), printable posters and social media posts (Appendix B), and a printable brochure (Appendix C). With our toolkit, members of the UBC community can learn more about the food system while making sustainable food choices and creating a more environmentally friendly community. This will lead to reducing UBC's food system carbon footprint and contributing to climate action in the community.

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List of Abbreviations

CFFS	Climate Friendly Food System
CFFSAT	Climate Friendly Food System Action Team
CBAR	Community Based Action Research
CSA	Community Supported Agriculture
UBC	University of British Columbia
SEEDs	Social Ecological Economic Development Studies
CAP	Climate Action Plan
GHG	Greenhouse gas
FG1	Focus group 1: Focus group comprised of students who are involved in campus food initiatives
FG2	Focus group 2: Focus group comprised of CFFSAT members
FG3	Focus group 3: Focus group comprised of students representing the UBC student body

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Figure 1: Overlapping results from primary data collection and secondary data collection



Introduction

1.1 Research Topic

The UBC Climate Action Plan (CAP) 2030 is an in-depth strategy designed to mitigate greenhouse gas emissions across the UBC Vancouver campus. With food systems being the second highest contributor to emissions after commuting, the CAP aims for a 50% reduction by 2030. To achieve this goal, CAP 2030 has outlined a holistic approach, including a "campus-wide food system strategy" that addresses all aspects of the UBC food system, from production and consumption to waste management (UBC Campus and Community Planning., 2024). One of the immediate actions outlined in CAP 2030 is the development of a toolkit aimed at promoting sustainable food related choices and habits. This initiative, referred to as the Climate-Friendly Food Systems (CFFS) toolkit, aims to engage directly with students on the UBC campus, raise awareness about climate-friendly food options, and foster consumer-driven change. Under CAP 2030, UBC has committed to transition to an environmentally friendly campus food system. The completed CFFS toolkit will serve as a pivotal tool in empowering UBC students to make informed decisions regarding climate-friendly food and help catalyse systemic change at the institutional level.

This report documents the collaborative efforts of the LFS 450 student-led research group to gather data on the appropriate content, design, and messaging strategies in regard to the Climate-Friendly Food Systems (CFFS) toolkit and apply this data to develop a polished toolkit draft as tasked by clients Simmi Puri of Campus and Community Planning and SEEDS Sustainability Program Representative Juan D. Martinez. Through a combination of literature review and focus group sessions, the report synthesizes primary and secondary research to define and develop recommendations for the toolkit's creation and advancement.

The research conducted focused on gathering and analysing diverse student and faculty perspectives as well as procuring the best messaging practices for advancing climate-friendly food actions.

By empowering the UBC community with knowledge and resources, the toolkit aims to promote healthy lifestyles, contribute to reducing greenhouse gas emissions, and foster environmental stewardship by encouraging sustainable initiatives and actions.

1.2 Research Relevance

The student-led research conducted in the development of the Climate-Friendly Food Systems (CFFS) toolkit holds significant relevance in addressing pressing climate related concerns within the UBC campus and community. By offering practical guidance on UBC's Climate Friendly Food Systems, the toolkit will empower community members to make healthier and more sustainable food choices, ultimately leading to decreased waste and greenhouse gas emissions. The importance of such initiatives is amplified by the substantial contribution of food systems to greenhouse gas (GHG) emissions, accounting for 21-50% of global emissions (UBC Campus and Community Planning., 2024). In the context of UBC, food systems contribute over 29,000 tonnes of carbon dioxide equivalent (tCO₂e) per year, making it a significant source of emissions (University Neighbourhoods Association., 2022). The impact of the food system on the environment, highlights the urgency of addressing this issue. While considerable progress has been made in planning, research, and content development for the CFFS toolkit, further assistance is needed to ensure its effectiveness. UBC SEEDS Sustainability Program Representative Juan D. Martinez and Simmi Puri of Campus and Community Planning have requested support in conducting research to identify effective toolkit content and engagement strategies. Reviewing past student and faculty-led toolkit work and soliciting input from the campus community through focus groups are essential steps in refining the toolkit's development. Evaluation of the toolkit's efficacy in conveying its intended messaging and engaging the target audience, particularly the 18-24 age demographic and post-secondary student population, is crucial for its success. Overall student-led research plays a vital role in addressing the complex challenges posed by food systems and climate change at UBC. By developing a comprehensive CFFS toolkit and leveraging effective engagement strategies, the research aims to empower individuals to make informed choices and drive positive change towards a more sustainable future.

1.3 Context

Societal Context

The creation of a Climate-Friendly Food System (CFFS) toolkit exists within a rich societal context deeply intertwined with urgent global challenges. Our project's goals align with global targets for GHG emission reductions – which are a crucial part in mitigating the worst effects of anthropogenic climate change (UNFCCC, 2016). The current analyses of climate change impacts on food security are incomplete and it is extremely challenging to precisely assess the current status of global food security (Wheeler & Braun, 2013). However, the big picture is clear that while 821 million people are undernourished, an additional 2 billion

people struggle with obesity (Mbow & Rosenzweig, 2019). Moreover, up to 100 million more face the threat of food insecurity due to rising food prices and changing growing conditions (2019). These facts demonstrate the inadequacy of our current food system and the clear need to shift the current food system towards more sustainable practices and consumption patterns (Fresco, 2009).

Our project's goal of emissions reduction for climate change mitigation also intertwines with human rights issues. Data reported that most climate change-related disasters, including extreme weather occurrences, take place in nations whose social protection systems are insufficiently strong to address hunger brought on by environmental factors and where the right to food is already being violated. Those least responsible for but the most vulnerable people suffering from climate change impact include Indigenous Peoples, small-scale food producers and low-income households particularly in developing countries (Secretary-General, U. N., 2023). In order to uphold the right and the livelihoods, knowledge and traditional ways of these vulnerable groups around the world not being threatened by climate change and competition over resources, reducing GHG emissions and promoting a sustainable food system are necessary to ultimately reduce its negative impacts.

UBC Context

A net zero emission system aims to minimize all emissions created by humans, including those from companies and cars that run on fossil fuels. Under the terms of the UBC Climate Action Plan 2030 (CAP 2030), the institution will accelerate its journey to net zero emissions for buildings and energy supplies and will cut greenhouse gas emissions for extended impact regions by a considerable amount during its period and after. Since UBC campus recognizes food systems as the second highest contributor to its total operation emissions, CAP 2030 set an ambitious goal to achieve overall 85% reduction in campus operations emissions, and 50% GHG emission reduction of food systems, which both exceed the 45% Paris Agreement (University of British Columbia, 2019). The creation of the Climate-Friendly Food System (CFFS) Toolkit is part of the actions outlined in the UBC CAP 2030.

The majority of UBC community members understand and support the campus's initiatives; however, people are constantly surrounded by slogans and posters, and are not guided by a handy, practical tool that they can implement into their daily lives. The creation of CFFS Toolkit is to take this role, educating students about related knowledge and helping them make sustainable food choices. Moreover, as a college student, one knows that useful information is universally available, but not only is this unorganized information confusing, its

cumbersome search steps can be a barrier to using it, it was concluded that in some cases the way information is conveyed to the student body sometimes matters more than the information itself (White et al., 2019). The CFFS Toolkit aims to collect and organize useful information which aligns with students' diverse perspectives and needs, and then deliver this information package in a way that students would accept and could be conveniently applied into their busy academic lives.

1.4 Purpose, Goals, Objectives

Purpose

The purpose of this project is to develop and refine a comprehensive toolkit that will engage with and empower UBC students, foster food literacy, and propel the establishment of a climate friendly and sustainable food system.

Goals

- Enhance climate and food system literacy with the UBC campus community by providing effective resources, tools, and knowledge and in turn encourage positive climate and sustainability efforts.
- Reduce greenhouse gas emissions and non-biodegradable waste products at UBC by promoting awareness, action, and sustainable initiatives.

Objectives

- Conduct a literature review to identify successful strategies for community engagement and examine successful approaches utilized by other universities to promote active involvement in climate and sustainability initiatives.
- Analyse existing materials and resources from Climate Friendly Food Systems (CFFS) projects and identify potential barriers with the toolkit development
- Hold focus groups to gather qualitative data from important student organizations, the CFFS action team, as well as a representative sample of the student population with the intention of incorporating diverse insights, perspectives, and ideas from the campus community to guide toolkit development

Research Methodology and Methods

2.1 Research Methodology

Community-Based Action Research (CBAR) is a research approach that actively involves members of the community being studied as active participants in the research process (Senge & Scharmer, 2008). In CBAR, community members are not merely subjects or participants but are involved in all stages of the research process, including identifying research questions, designing methodologies, collecting and analyzing data, and interpreting and disseminating results. This approach recognizes the expertise, knowledge, and lived experiences of community members and seeks to empower them to drive change based on research findings (Senge & Scharmer, 2008; Gullion & Tilton, 2020). The CFFS Toolkit is guided by CBAR, the students who are involved in the toolkit creation will also be the users of it, this represents the designer's up-to-date understanding of the realities of the school and, and to some extent experience the same feeling for the needs of the community study participants. This project also involves engagement and collaboration with other various stakeholders within the UBC community, including non-profit organization, staff, dining services, and sustainability offices. This collaborative approach ensures the credibility of the data collected while reflecting the perspectives of people from different organizations, faculties, and backgrounds within the campus area. (Shalowitz et al., 2009).

2.2 Research Methods

We conducted multiple types of research to collect both primary and secondary data, as outlined below. We used a literature review to conduct secondary research, and our primary research was conducted via focus groups.

2.2.1 Secondary Data Collection

The goal of our secondary data collection was to inform our knowledge of existing barriers to eating a climate-friendly diet and how sustainable behaviour changes can be encouraged. We conducted a literature review of academic sources, pre-existing SEEDS project work, and various relevant institutional sources. Much of the literature we reviewed was based on the disciplines of psychology and marketing and examined the mechanisms of consumer choice and how these choices can be influenced.

We conducted our initial literature review using the UBC Library's online database to gain access to academic articles on our topics. Search terms included "sustainable food", "plant-based diet", and "sustainable consumption". Article abstracts were reviewed to determine if articles were relevant to our research. Non-academic literature and policies that were frequently mentioned in articles were also reviewed. Finally, additional literature was gathered based on personal knowledge, including research and literature our group members were aware of due to other classes and workshops.

2.2.2 Primary Data Collection

Our primary research objective was to gather opinions from UBC community members and collect information, feedback and opinions we could implement in the toolkit. Our primary data collection used focus groups to conduct our research. We concluded that the use of focus groups was the best method for our research because their group setting allows for ideas and knowledge to transfer between participants, allowing for in-depth conversations that wouldn't be possible in one-on-one interview settings. Each focus group was conducted with one team member asking questions, and another either taking notes or taking an audio recording. Each participant signed consent forms at the beginning of the session.

We conducted three focus groups in total, each lasting an hour. The first was with students active in organizations working within UBC's food system (Sprouts, Agora, FoodHub). This focus group had 5 participants. This was the only group where we used note-taking as opposed to audio recording to collect data. Our second focus group was composed of members of the UBC CFFSAT, with 9 participants. Our third focus group was students from the general student population, this group had 10 participants and was the only focus group conducted via Zoom. Focus group questions are listed in Appendix D. Audio from recorded focus groups was transcribed, and thematic analysis was conducted to extract qualitative data from all three groups.

2.3 Methods of Administration

Our recruitment strategies were different for each focus group, as each one comprised different stakeholders from the wider UBC community.

For our student organization members group, we reached out to Sprouts, the FoodHub, and Agora Café on Instagram and emailed two members from each of their teams to attend the focus group. We also went to Sprouts in person to reach out upon not receiving responses to our initial contact. Final confirmation of dates and times was conducted via email with all organizations. The focus group was conducted on March 5th.

For our focus group with the CFFSAT, we arranged for the focus group to take place during one of the team's pre-established meetings with the help of our SEEDS Sustainability Program representative Juan Martinez. Invitations were sent via email by Juan and attendance was confirmed via email correspondence. The focus group was conducted on March 15th.

For our general student focus group, we created a Qualtrics form for students to sign up to take part in the session. We also created a poster to communicate our project's intent and had a \$10 UBC Food Services gift card incentive for focus group participants. We distributed the poster and survey link via multiple channels, including by reaching out to multiple campus organizations to post it on their social media, including UBC Foodie, UBC LFS, and UBC AMS. We also used our connections to reach out to additional participants. Subsequent organization was done via email. The sign-up survey was open from March 12th to March 17th. The focus group was conducted on March 18th.

Results

Section 3.1 - Primary Research Results

Our focus groups generated significant insights. Many key themes emerged from each of the stakeholder focus groups.

Section 3.1.1 - Focus Group #1 Results: Student Organizations

Campus Food Organizations

Participants highlighted the importance of supporting current food organizations on campus. By using those services, students are doing a lot for the UBC food system's sustainability. Additionally, they highlighted the fact that current UBC-related supports on campus are far better than those offered off-campus. Given the existence of these food-related programs on campus, much of the issue rests with spreading awareness of the services.

“Lots of people aren’t aware.”

“Food Hub does a great job doing events but is it all the same people attending.”

“It’s a balance of wanting people to access but only being able to feed so many people.”

“UBC is doing a much better job. Once you live on your own, it’s hard to find resources”

UBC Courses

Participants expressed that most of what they know about food and its climate impacts comes from their academic courses. They also noted that these courses aren’t required for most degrees and expressed concern that many students would thus not likely be exposed to information about food and the climate. UBC resources were also mentioned as a good educational source.

“I learn from environmental science courses, they have a focus at some point on food and climate.”

“I learn from the Sustainability Hub. They’re always doing things related to climate change.”

“UBC needs to reevaluate core courses.”

Ease of Dietary Changes

Each member of this group expressed that they ate a plant-based diet, and many were entirely vegan or vegetarian. The group as a whole expressed that making this switch had come easily since it aligned with their financial constraints and social influences.

“Cost-wise, it’s easier to cut out meat.”

“Why? Cost. Meat goes bad. I’d like my food to last.”

“Going vegan is the most impactful choice an individual can make. Why would I not?”

Section 3.1.2 - Focus Group #2 Results: CFFSAT

Perceived need for animal protein

Participants noted that they think many students feel the need to eat animal products because they're concerned with protein intake.

"Students say "I need protein so I must eat animal protein""

"When people are on the go, they prioritize filling meals, which they think are meat"

Confusion around "Plant-Based"

Participants noted that it seems many students don't know the definition of 'plant-based', and assume it means the same as 'vegan'.

"A lot of students think plant-based means vegan and vegetarian eating but it really just means eating more plants"

"Calling plant-based options "vegan" or "vegetarian" is something we're stepping away from"

People don't like to be told they're wrong

This theme emerged between participants as they discussed how much of their work aims to avoid shaming students for the food choices they make.

"Avoid shaming, focus on the positives; people don't like being told what they're doing wrong, and it doesn't have to be all or nothing"

"we try to tell students every little bit counts and try to see what you can add rather than subtract"

Don't frame plant-based food in comparison to meat

Participants expressed the importance of not framing, serving, or displaying plant-based foods as direct substitutes for meat options. This makes choosing a plant-based lasagna over a meat-based one feel like a compromise. Instead, let plant-based options stand alone.

“People expect plant-based options are a replacement/substitute for meat – and don't like that it doesn't taste like meat”

“Picky eaters would rather eat a salad with beans in it, than with mock meat – find recipes that aren't mimicking meat meals”

“Don't introduce meat alternatives, just introduce new dishes that are more climate friendly”

“Alternatives aren't that great, meat based, and plant-based meals are marketed side by side which makes it look like the plant-based version is a compromised version is of the meat-based meal; make it completely different so it can stand on its own”

People like eating meat

This focus group affirmed the fact that people like eating meat, and discussed how this fact is a large part of what makes encouraging a CFFS difficult. This includes cultural considerations.

“People like eating meat – they try to say other things so they don't have to say that out loud – they enjoy it”

“Where I come from, we eat meat.”

Section 3.1.3 - Focus Group #3 Results: General Student Group

Dread and hopelessness around sustainability terms

Overall students didn't have a positive reaction when shown a list of words relating to climate change, CFFS, and environmental action.

“Buzzwords aren't doing much”

“Greenwashing buzzwords; we see them too much with no meaning behind them”

Importance of social networks

Participants cited social networks and friends are one of their main influences in eating climate-friendly foods and learning about sustainable food systems.

“Learned from people within my community, the majority of my friends are vegan or vegetarian, and they influence me a lot. It’s one thing to see something on social media and another to trust a person and what they’re telling me, that makes it stick with me more”

Preference for student-coded designs

Students expressed a preference for posters that looked like they had been made by students over those that looked like they had been made by formal institutions at UBC.

UBC design:

“Looks generic; doesn’t scream sustainability”

“It looks like it would have very formal words on it; probably has meeting notes or something irrelevant to me”

“Wouldn’t draw my attention”

Colourful & Graphic design:

“More creative and likely made by a student, so it gets me interested”

“Made my student or someone more relevant to me which would be more enticing to read”

You vs. We

Students preferred content that carried a collective “we” message over content that carried an individualized “you” message.

“The “you” can make a positive impact feels a bit targeted and guilt trippy, but the “we” feels better”

“The “you” feels disingenuous, but if everyone does it collectively, that’s when change is more likely to happen.”

“The “you” feels targeted.”

Instructive messaging induced feelings of spite

When shown posters with instructive messaging to “Eat more plants” and “Eat less beef”, students expressed that they didn’t think this was effective messaging and felt more desire to consume beef after reading the poster.

“But you put really nice cuts of beef on the meat poster, so it makes me want to eat it.”

“If I only saw the beef one, I would think absolutely not, and maybe eat meat out of spite. I would rather be encouraged to do something than be told to do something.”

Section 3.2 - Secondary Research Results

We conducted our secondary research to gain a better understanding of how sustainable behaviour changes can be encouraged, and what common barriers to eating a sustainable diet are.

Section 3.2.1 - How Sustainable Behaviour Changes can be Encouraged

To understand how UBC can move towards a CFFS, it’s important to understand how community members can be encouraged to adopt sustainable behaviours such as a climate-friendly diet. The SHIFT report identifies five key areas of opportunity for influence: social influence, habit formation, individual self, feelings and cognition, and tangibility (White & Habib, 2018). Within this wider framework, multiple concepts relevant to our project were identified. Social norms are a powerful tool in influencing behaviour. Descriptive social norms refer to what others commonly do, while injunctive norms convey what should be done (White & Habib, 2018). The report also addresses the importance of evaluating whether collective framing (addressing ‘we’) or individual framing (addressing ‘you’) is better for any given context. In addressing habits, the foundation of most behaviours, the authors state that habits are upheld by three factors: repetition, low cognitive function, and a stable context. Particularly relevant to our project is stability of context, as instability can provide an opportunity to form new habits. White and Habib state that “A changed context can promote the use of conscious decision making, leading to better conditions for people to change their existing habits. During big life changes people are more likely to increase their eco-friendly behaviours.” (2018) This can be applied to the UBC CFFS context as students are in the midst of an unstable period of life that provides an opportunity to form sustainable habits. Framing the tangibility of an issue is another important concept. Positive impacts are better received when paired with abstracted far-away messages, while negative impacts are better paired with localized and specific messages (Zhao et al., 2023). Indeed, framing issues as tangible and local is particularly important when the goal is to encourage sustainable behaviour change. (White & Habib, 2018). A final important consideration that emerged was the concept of reactance. Reactance occurs when an instructive

message causes a consumer to feel attacked or controlled. When reactance occurs, the consumer is motivated to do the opposite of what is instructed (White & Habib, 2018). Avoiding causing reactance is an important consideration when attempting to influence behaviour.

Section 3.2.2 - Barriers to Sustainable Eating

In our secondary research, three key areas emerged as barriers to adopting a sustainable diet. These were cultural factors, education, and affordability. Meat is examined as an important driver of unsustainable eating. Eating meat is a common cultural norm. (Nguyen & Platow, 2021) It can play an important role in connection to one's culture and identity. Additionally, many traditional views link masculinity with meat consumption, posing an especially notable barrier to sustainable eating for men (Slotnik et al., 2023) (Mediarmid et al., 2016). Insufficient education about food and animal products' environmental impact is also a significant barrier. Many college students perceived other eco-friendly habits as more impactful than a plant-based diet and thus prioritized making changes such as using less plastic over changing their diets (Slotnik et al., 2023). Finally, affordability emerged as a significant barrier to consuming a plant-based, climate-friendly diet. Low-income households are particularly likely to cite cost as a barrier to consuming plant-based foods (Slotnik et al., 2023). Each barrier was important to consider for our project.

Discussion

Within both of our primary and secondary research we encountered a web of interconnected results. Among these discoveries, a common theme emerged which was the power of optimism and empowerment within messaging strategies. When framed in a positive matter, individuals were more likely to consider options of both individual and collective climate action. Framing proved to be pivotal for instigating motivation and fostering a sense of agency among focus group participants. We observed that shifting the language from the singular "you" to the inclusive form "we" evoked a spirit of collaboration but also amplified the impact of the message. An example of this in practice could be instead of framing something like "you should make a

Climate Friendly Food System Toolkit difference,” we could instead say “together we can make a difference”. Our research also amplified the need to steer clear of shaming when promoting climate friendly food options. Language and visuals are both powerful tools and have the ability to induce guilt which proved to be very counterproductive in motivating sustainable behaviours. Through our data collection we also recognized the critical role of using familiar units of measurement to enhance comprehension and facilitate easy understanding among audiences. Our research also illuminated the need to prioritize cultural sensitivity and inclusivity measures when promoting sustainable eating habits. Recognizing diverse cultural backgrounds and community preferences are incredibly important for fostering a sustainable food system. These insights have collectively served as guidance and help inform the development of the Climate Friendly Food Systems toolkit.

4.1 Links between Primary and Secondary Data

When analyzing our primary and secondary data, there were many overlapping findings. The overlap we found between many of our data sources serves to strengthen our findings.

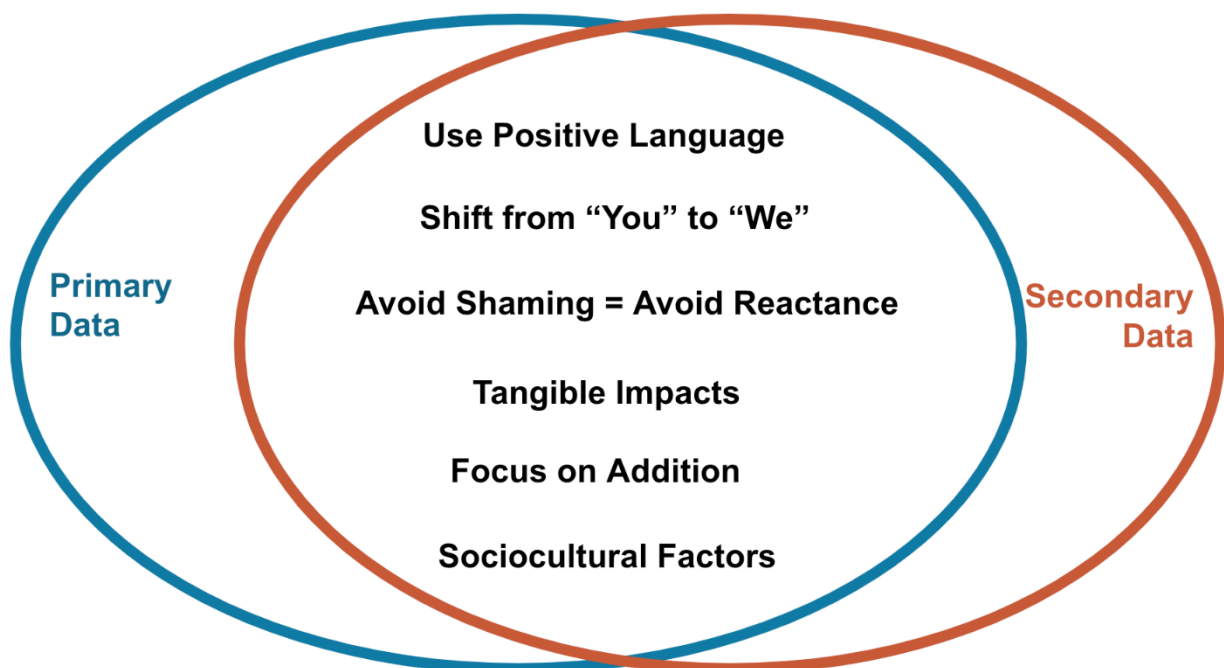


Figure 1: Overlapping results from primary data collection and secondary data collection

Reactance

An important finding in the secondary data was reactance, which occurs when instructive messaging is perceived as too controlling and causes a spiteful reaction in which consumers will do the opposite of what is

suggested (White & Habib, 2018). We found ample support for this finding in our focus groups. Staff participants in FG2 noted that they work to avoid shaming students, as people don't like to be told they're doing something wrong. This is a strategy for avoiding reactance. Students in FG3 expressed that when shown an "Eat Less Beef" poster, it made them want to eat more beef. This is an illustrative example of reactance and gave us an idea of what types of messaging were important to avoid.

Individual vs. Collective Framing

Literature supports the importance that individual and collective framing can have and stated that finding the correct frame in a given context is vital (White & Habib, 2018). Based on our focus groups, we concluded that UBC students prefer collectively framed messages. They preferred this because it encouraged feelings of hopefulness and felt less personal. The concept of preferring a less personal, call-out message links to the avoidance of reactance.

Social norms

Secondary and primary data both supported the power of social norms in encouraging CFFS-promoting behaviour. This was illustrated by FG1 participants' agreement that their social circles were the most important factor in their adoption of sustainable diets. Additionally, the power of social group dynamics was illustrated in FG3 students' preference for materials that appeared to have come from other students (part of their social group).

Tangible impacts

White and Habib outline the importance of localizing impacts (2018). FG2 and FG3 both reiterated this statement, especially to ensure that students can adequately understand the impacts of certain foods.

Financial barriers

This finding was supported throughout the data. Affordability and perceived affordability are key obstacles to eating a sustainable diet (Slotnik et al., 2023). Students in both FG1 and FG3 expressed that the cost of meat was a large deterrent in purchasing it. Staff in FG2 noted that ideas around the higher value of meat-based food led to students eating more meat to get better value from meal plans.

Cultural barriers

Culture plays a large role in the importance of meat consumption (Nguyen & Platow, 2021). This was supported by FG2 participants, who expressed that preferences and upholding cultural appropriateness of food were barriers to making more of UBC's food plant-based.

Education gaps

Literature supports the importance of education in promoting a CFFS (Slotnik et al., 2023) and our focus group data underlines this support. Each of our three groups outlined different roles for education. FG1 stated the importance of UBC students becoming more knowledgeable about campus food resources to promote a CFFS. FG2 outlined many common misconceptions from students in understanding the purpose and nutritional value of plant-based diets, as well as concerns around students not understanding important sustainability language. FG3 expressed interest in learning more about a CFFS

4.2 Interpretation and Application to Deliverables

The findings from our primary research can be analyzed in two parts: toolkit content; and messaging strategies.

4.2.1 Toolkit Content

The first purpose of our focus groups was to understand the resources that are desired by the student body. Our focus group results showed a number of recommendations for content that should be implemented in the toolkit resource. The students part of the food organizations on campus highlighted the importance of their involvement in the current food organizations on campus. UBC Campus food organizations, like Agora Cafe, Sprouts, and Food Hub, directly impact the campus food system with issues of food security and food waste. However, these food organizations are not popular amongst most UBC students due to unawareness about these initiatives. Moreover, involvement in these initiatives may have a correlation with students' likelihood to eat less animal products, as the student participants of this focus group shared that it was easy for them to adopt and maintain a plant-based diet. They also indicated that much of what they learn, in terms of food and climate impacts, are through the courses they take at UBC.

Additionally, the SEEDS CFFSAT disclosed the perceived need for animal products by UBC students. This finding revealed the misconceptions held by students in regards to nutrition, specifically plant based

proteins. We were also told that students did not understand the term, ‘plant-based.’ In relation to this, our general student focus group participants explicitly communicated their lack of awareness surrounding sustainability language. We interpreted these discoveries as a need for resources within the toolkit that provide clear definitions for these terms.

4.2.2 - Messaging Strategies

The second purpose of our focus groups was to gain insight into effective messaging strategies and communication channels for the toolkit resource. One of the most significant findings was that students preferred materials that had been designed specifically to appear that they were student-created as opposed to coming straight from UBC itself. We applied this to the toolkit by being intentional about using bright colours, playful fonts, and ‘cute’ graphics. We also were intentional about changing all messaging to a collective frame. We went through the toolkit to make sure this was consistent. Students in FG1/FG3 and staff in FG2 expressed the importance of using social media and digital tools to spread our toolkit. We accounted for this by ensuring that our largest toolkit component, the handbook, could be easily shared through social media to access its complete PDF form. We also created bite-sized visual content that could be shared as grid posts on Instagram or Facebook. Although the online importance was highlighted, others also emphasized that physical posters are still very effective. Thus, all materials in the toolkit, including the QR code can also be printed into physical form to fulfil both distribution tactics.

4.3 - Unexpected Findings

Some unexpected findings arose during our research, surrounding promotional materials and communication sources. We found that the participants of focus group #3 preferred posters that looked like they were designed by students more than posters that utilize UBC colours and branding. The participants felt as though the posters that used UBC branding were generic and not intended for them to pay attention to due to the high prevalence of similarly branded posters seen around campus. Moreover, the students expressed that they ‘trust’ messaging that comes from students over messaging that comes from the university administration. These findings suggest that content and messaging that appears to be produced by students are more effective at influencing the actions of their peers.

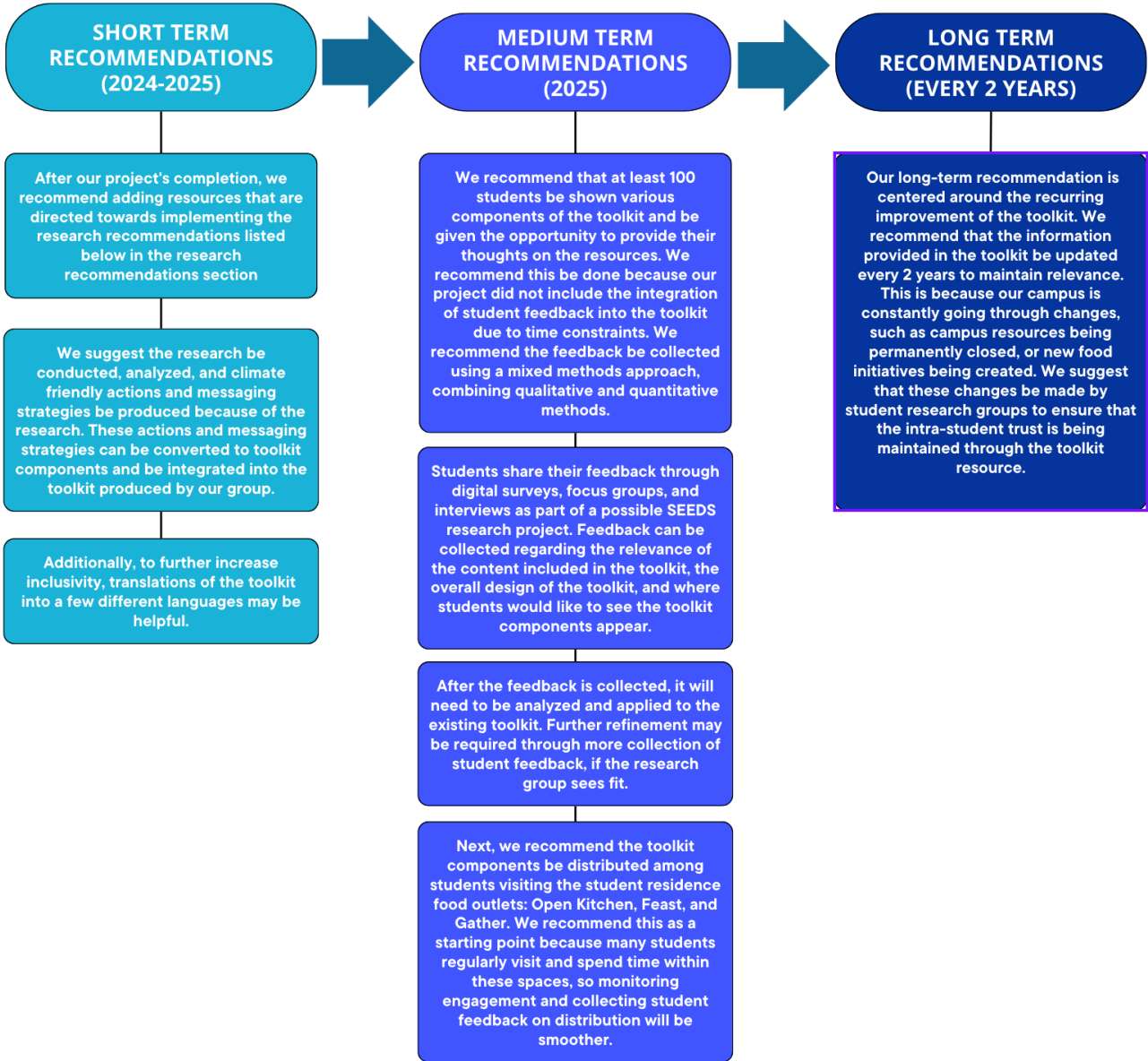
4.4 - Data Limitations

In the third focus group interview, although we tried to recruit students from different academic years and from different faculties as samples, the sample size was unfortunately very small (only 12 students for both the in person and virtual modes combined), and it should be noted that majority of the participants were students with an interest in sustainable food systems themselves. The targeted people of our toolkit, students who know little and rarely care about campus' sustainable initiatives, are not the majority involved in our focus group interview, and we have little information from this group of people. While focus groups provide rich qualitative data, the insights gained may not necessarily represent the broader population's views or experiences. Moreover, the potential for group dynamics and social influence within focus groups can impact the authenticity of participant responses. Individuals may feel pressure to conform to group norms or withhold dissenting opinions, leading to biased or incomplete data. We noticed that dominant personalities or group hierarchies may influence the conversation, overshadowing quieter voices or diverse perspectives. For example, we overly heard about the opinions about how participants get involved in sustainable actions in their lives but not about the opposite. So, we can assume that the sample of the third interview group is not a good representation of the general student population.

Recommendations

5.1 Recommendations for Action

Our recommendations for action are centered around refining, improving, and disseminating the toolkit resource.



5.2 Recommendations for Future Research

Our research recommendations pertain to our first recommendation for action, the addition of resources to help improve the inclusivity of our toolkit. These recommendations emerged as a result of time and capacity constraints in our project. We hope that through further research of these topics, the toolkit resource will become more applicable to all members of the UBC community.

1. Cultural identities surrounding food and the UBC campus food system

The UBC international student population possess cultures and traditions from over 160 different countries (Sadiq & Averill, 2024). We recommend that the topic of food and cultural identity be explored due to the importance of culture within food spaces. Food is a significant part of many cultures, so it is imperative that this be considered when furthering research about the toolkit resource. Further research needs around culturally appropriate food messaging, and how that can be applied to the toolkit resource. Moreover, research into culturally appropriate food recommendations should be conducted, along with the exploration of inclusive language use. These findings should help the toolkit go from being a resource for some, to being a resource for all.

2. Off-Campus Resources

Our next recommendation involves the exploration of resources for students living off campus. A few of our focus group participants told us that, although they spend a considerable amount of time on campus, they do not reside on campus. Many students live in areas of Vancouver that differ from campus, in terms of available resources. Additionally, many students commute from cities outside of Vancouver, such as Burnaby, Surrey, and Richmond. Researching ways these students can make climate friendly food choices is worthwhile because they will still interact with the campus food system in different capacities. We recommend that secondary data about the resources in specific areas within Metro Vancouver be collected, including information on local markets, ways to get involved in community climate initiatives, and how to mobilize change within these communities.

3. Staff and Faculty Resources

Our last research recommendation is to research climate-friendly food resources specifically for staff and faculty. There are over 18,000 people employed as staff and faculty at UBC, so we recommend that specific resources and messaging strategies be explored for this group. We recommend a wide variety of staff and faculty from different departments, as well as various age ranges, be studied for barriers in their abilities to make climate-friendly food choices. Then, effective strategies to overcome these barriers should be explored. A literature review should also be conducted to investigate how effective toolkit-style resources are for staff and faculty at other universities and organizations.

Conclusion

In our development of a Climate Friendly Food Systems (CFFS) toolkit, we have drawn from an abundance of insightful primary and secondary research, leading us to identify key factors influencing sustainable behaviour change and address critical adoption barriers. Our findings highlight the importance of positive messaging and framing strategies when fostering climate action and engagement. Our research has underscored the significance of temporal, financial, educational, and cultural barriers in promoting sustainable food and climate action, reiterating the need for inclusive and accessible resources. Through the use of focus groups, we were able to reveal important student preferences, like that of student created content and collectively framed messaging. These preferences helped guide our toolkit design and structure. To ensure the toolkit remains relevant and impactful, our recommendations for future action and research outline strategies for continuous improvement and adaptation. Through our research and in turn the development of this CFFS toolkit, we aspire to catalyze positive change and cultivate a culture of sustainability that exceeds our UBC campus. Together, we can make a difference!

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Appendices

APPENDIX A: Digital Climate Friendly Food Handbook

URL for the complete version of toolkit:

<https://drive.google.com/file/d/1CwhquQhD3Ls-gu41quhUg-uGQNLjqOh4/view?usp=sharing>

UBC CLIMATE FRIENDLY FOOD HANDBOOK
 THE UNIVERSITY OF BRITISH COLUMBIA
 sustainability
 Climate Action Plan 2030

TABLE OF CONTENTS

- Food and Climate 101
- WHAT'S A CLIMATE FRIENDLY FOOD SYSTEM?
- UBC'S CLIMATE-FRIENDLY FOOD LABEL *Seen it around campus?*
- Protein in Focus *Gymrats start here!*
- WHY EAT LOCAL?
- HUNGRY FOR IDEAS? *Recipes and more*
- QUICK BITES ON CAMPUS
- CLIMATE ACTION AND CHILL *Docuseries and more*
- GET INVOLVED *Action = Impact*

climate-friendly Waste Local Food Farming practices

WHAT IS A CLIMATE FRIENDLY FOOD LABEL?

The Climate-Friendly Food (CFF) Labels provide info about a meal's environmental impact. This includes GHG emissions, land use, nitrogen impact, and water usage. These labels allow students to make informed choices while eating at dining halls.

- Red labelled meals have a typical level of negative impact compared to the average item on the dining hall menu.
- Yellow meals have lower impact than the average meal, but still have a higher impact than green-labelled items.
- Green labelled meals have less than 50% of the environmental impact of the average item on the dining hall menu.

HOW DO WE CALCULATE CLIMATE FRIENDLINESS?

The CFFS team reviewed over 775 menu items to quantify environmental footprints GHG emissions, land use footprint, embedded nitrogen, and water use associated with the production of each ingredient.

FIND THE LABEL IN UBC'S DINING HALLS

GAATHER OPEN KITCHEN Feast

CLICK HERE TO SEE THE CALCULATION

EXPLORING PROTEIN SOURCES

Protein is an essential nutrient needed by human body: They're the building blocks of our muscles and bones! High quality protein can be found in both plant and animal sources. Most adults need 1g of protein per kilogram of bodyweight. This can increase up to around 1.5 g/kg for active individuals.

21 G PROTEIN PER 100 GRAMS BEANS	13 G PROTEIN PER 100 GRAMS OATS WHOLE GRAINS	20 G PROTEIN PER 100 GRAMS PEANUTS NUTS
8 G PROTEIN PER 100 GRAMS TOFU	30 G PROTEIN PER 100 GRAMS PUMPKIN SEEDS SEEDS	11 G PROTEIN PER 100 GRAMS EDAMAME
8 G PROTEIN PER 150 ML DAIRY MILK	6 G PROTEIN PER EGG EGGS	23 G PROTEIN PER 100 GRAMS CHICKEN BREAST

Chicken has 1/10th the impact beef does, making it a better choice of meat.

WHY SHOULD WE EAT LOCAL AND SEASONAL?

By eating local and seasonal, we are supporting local economies and helping local food systems flourish.

A great place to find local produce are the various farmer's markets around Vancouver

Click here to find your closest farmers market

Did you know You can purchase fresh produce on campus at UBC Farm?

Click here for all the info on how you can get your hands on some UBC Farm goodies!

Click here to check out what's in season in BC all year round!

HUNGRY? ...TRY THIS!

Skye's Chickpea Noodle Soup

"A plant-based spin on the classic dish, chicken noodle soup. This soup will leave you feeling satisfied and cozy, and best of all, it uses minimal ingredients and is super straightforward to make."

Ingredients you'll need: parsley, onion, carrots, pasta, celery, Chickpeas

Click here for the full recipe

Click here to find out when!

INTERESTED IN MORE RECIPES?

NYT Climate Friendly Cooking Page
Find climate friendly recipes organized by preparation time, dietary needs, and difficulty of preparation.

UBC Foodie Blogs
Helpful blog posts include, "Plant Based Eats that Love the Earth," "Understanding Plant Based Proteins," and "5 Simple Ways to up your veggie intake."

Earth Day Climate Friendly Recipes
Try a variety of easy, climate-friendly recipes, including, veggie pasta, cauliflower wings, and fried rice

NEED A QUICK BITE?

Check out these campus food outlets for some climate-friendly bites

sprouts
Sprouts is a student-run organization with a goal to make fresh, sustainably produced food accessible for the UBC community. They are famous for its vegan brownies and hearty soups.
Location: Basement of Life building

Agora Eats Café
Agora cafe is an independent, student-run, volunteer-based and non-profit café that is committed to local sustainable food systems. Be sure to try their popular chana masala dish!
Location: Basement of Macmillan building

MERCANTE
Mercante is famous for its fiery-hot stone oven cooks up some of the best pizzas on campus, including a rotating vegan feature that changes every month.
Location: Ponderosa Commons

PERUGIA ITALIAN CAFE
Perugia is popular amongst students for their flatbread and pasta options. Be sure to try the mediterranean chickpea salad, and the tomato & mushroom flatbread
Location: Life Science Building

GALLERY PATIO & LOUNGE
The Gallery Patio & Lounge offers a variety of vegetarian food including the Gallery nachos and Tuscan penne.
Location: 4th floor of the Nest

CLIMATE ACTION AND CHILL?

Meat Me Halfway
"The path to going plant-based has obvious upsides, but can also be isolating and difficult. Shouldn't there be some middle ground for people looking to make a change without totally upending their lives? Leader of the Reducetarian Movement, Brian Kateman explores this issue through the lens of his own personal decision to reduce eating meat. Grappling with how to sort through conflicting advice, Brian seeks a practical path forward."

Just Eat It: A Food Waste Story
"Filmmakers and food lovers Jenny and Grant delve into issues of food waste, from farm, to retail to the darkest corners of their own fridges and freezer. They vow to stop buying groceries and live solely off of discarded food."

Follow the Food
"A multimedia series by BBC Future and BBC World News that investigates how agriculture is responding to the profound challenges of climate change, environmental degradation and rapidly growing populations that face our global food supply chains. Follow the Food traces emerging answers to these problems - both high-tech and low-tech, local and global - from farmers, growers and researchers across six continents."

LOOKING FOR AN ELECTIVE?

These courses are a great way to learn about sustainability and climate change!

CHECK THESE OUT!

- APBI 361: Key Indicators of Agroecosystem Sustainability
- BEST 201: Plants, Carbon, and Environment
- CONS 101 Introduction to Conservation
- CONS 200 Foundations of Conservation
- CONS 210 Visualizing Climate Change
- FNH 200 Exploring Our Food
- FRST 100 Sustainable Forests
- FRST 304 Forest Stewardship in a Changing Climate
- FRST 415 Sustainable Forest Policy
- LFS 250 Land, Food and Community I: Introduction to Food Systems and Sustainability
- GEOG 310 Environment and Sustainability
- GEOG 318 Sustainability in a Changing Environment
- NURS 290: Health Impacts of Climate Change



APPENDIX B: Social media posts/poster component of the toolkit

WHY SHOULD WE EAT LOCAL AND SEASONAL?

By eating local and seasonal, we are supporting local economies and helping local food systems flourish.

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Climate Action Plan 2030

CLIMATE-FRIENDLY PROTEIN SOURCES

- BEANS**: 21 G PROTEIN PER 100 GRAMS
- TOFU**: 8 G PROTEIN PER 100 GRAMS
- SOY MILK**: 8 G PROTEIN PER 250 ML
- WHOLE GRAINS**: 13 G PROTEIN PER 100 GRAMS OATS
- CHICKEN BREAST**: 25 G PROTEIN PER 100 GRAMS

chicken has 1/10th the impact beef does, making it a better choice of meat.

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APPENDIX C: Printable Brochure Component of the toolkit

HUNGRY?... TRY THIS!
Skye's Chickpea Noodle Soup

Ingredients
 2 tbsp extra-virgin olive oil
 1 medium yellow onion, chopped
 1 cup sliced celery
 1 cup carrots, peeled and cut into thin rounds
 ¼ tsp sea salt
 ½ tsp ground turmeric
 ½ tsp curry powder
 1 bay leaf
 1 can chickpeas, rinsed and drained
 1 cup dry spiral pasta
 2 tbsp chopped fresh parsley, plus extra for garnish
 8 cups vegetable broth
 Black pepper + sea salt, to taste

Method
 In a large soup pot, warm the olive oil over medium heat. Add the onion, celery, carrots and ¼ tsp salt. Cook until the onions are translucent and soft, stirring often (about 5-7 minutes)
 Add the turmeric and curry powder and stir constantly for 30 seconds.
 Add the chickpeas, pasta, parsley, bay leaf and broth. Increase the heat to high and bring the soup to a simmer, then reduce the heat to medium-low and continue simmering until the pasta is al dente (about 10-20 minutes)
 Remove the pot from the heat and season with salt and pepper to taste. Garnish with parsley
 Once cool, store the soup in an airtight container in the refrigerator, for up to 5 days

SAVE THESE FOR YOUR NEXT MOVIE NIGHT

MEAT ME HALFWAY

Meat Me Halfway
 The path to going plant-based has obvious upsides, but can also be isolating and difficult. Shouldn't there be some middle ground for people looking to make a change without totally upending their lives?

Follow the Food
 A multimedia series by BBC Future and BBC World News that investigates how agriculture is responding to the profound challenges of climate change, environmental degradation and rapidly growing populations that face our global food supply chains.

LOOKING FOR AN ELECTIVE?

APBI 361: Key Indicators of Agroecosystem Sustainability
 BEST 201: Plants, Carbon, and Environment
 CONS 200 Foundations of Conservation
 CONS 210 Visualizing Climate Change
 FRST 100 Sustainable Forests
 GEOG 310 Environment and Sustainability
 NURS 290: Health Impacts of Climate Change

CLIMATE FRIENDLY FOOD TIPS!



Scan me to visit the full climate-friendly food systems handbook!

DECODING IMPORTANT TERMS

Sustainability
 Meeting our needs without compromising the ability of future generations to meet their own needs.



HAVE YOU SEEN THESE SYMBOLS?

Yellow meals have lower impact than the average meal, but still have a higher impact than green-labelled items.

Green labelled meals have less than 50% of the environmental impact of the average item on the dining hall menu.

Red labelled meals have a typical level of negative impact compared to the average item on the dining hall menu.

The Climate-Friendly Food (CFF) Labels provide the UBC community with an opportunity to learn more about how their choices, supported by a more sustainable food system on campus, can help reduce the university's overall GHG emissions.

CLIMATE FRIENDLY PROTEIN SOURCES

9 G PROTEIN PER 100 GRAMS LENTILS	8 G PROTEIN PER 100 GRAMS TOFU
21 G PROTEIN PER 100 GRAMS BEANS	23 G PROTEIN PER 100 GRAMS OATS WHOLE GRAINS

WHY SHOULD WE EAT LOCAL?

By eating local and seasonal, we are supporting local economies and helping local food systems flourish.

Plant Based Eating
 Consuming a diet of primarily plants. Places an emphasis on making plant-based foods the star of your plate without necessarily eliminating all animal products.



GHG Emissions
 Gases that are released into the atmosphere as a result of human activity. GHG's contribute to planetary warming and climate change by trapping heat in the atmosphere.



Find the Label in UBC's Dining Halls

OPEN KITCHEN

GATHER (at Vanier)

Feast

APPENDIX D: Focus Group Interview Questions

Interview Questions for FG 1:

1. What does a sustainable food system look like to you?
2. What do you see as barriers to adopting climate-friendly practices for you personally? For UBC students in general?
3. In your opinion, what are effective ways to educate individuals and communities about the impact of food choices on climate change?
4. Within a resource toolkit on the Climate-Friendly Food System, what are essential components that you would like to see? What would be most helpful for the student body to know about?
5. What is your own climate-friendly food hack that you would like to share?

Interview Questions for FG 2:

1. What is your climate-friendly food hack, which is interesting and inspiring for others?
2. What do you think are the barriers to climate-friendly action being practiced at UBC?
3. In your experiences, what messaging/framing strategies are most/least effective for promoting long-term changes towards climate-positive behaviours?
4. As a representative of sustainability have you found any particular actions in past literature or reports on Climate Friendly Food Actions that have been communicated well or alternatively not?
5. In your opinion how effective have initiatives like that of the Climate Friendly Food label been in promoting positive action? What have been limitations?
6. How do students engage with the plant-based options in the dining hall? How do you think students take “climate friendliness” into consideration when making food choices?

Interview Questions for FG 3:

1. What influences the way you eat? Cost? Culture? Social Media? Trends? Climate Impact? Something else?
2. What are some climate-positive behaviours you are familiar with, and where did you learn about them?
3. What do you perceive as the main challenges to adopting more climate-positive eating habits for students?
4. What communication channels do you think would be most effective in promoting climate-positive behaviours among students?
5. Have you ever been influenced by others to adopt new sustainable habits? What made you change?
6. Can you tell us your thoughts when you first look at this poster? (UBC official versus. student made)

Visual examples used in FG3:



The Sky is Blue.

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ubc sustainability



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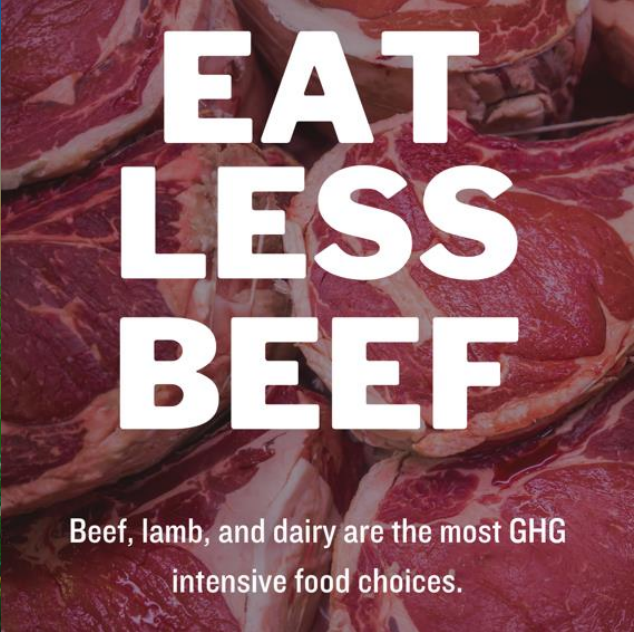
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EAT MORE PLANTS

Prioritizing plant-based foods can reduce your dietary footprint.



EAT LESS BEEF

Beef, lamb, and dairy are the most GHG intensive food choices.



Appendix E: Link to our Final Presentation
https://docs.google.com/presentation/d/1_KwAejs-zs8nF7J0bg7IadXzVQQgly0mQacChw1U9nI/edit?usp=sharing