The Effect of a Protein Label on Food Choices

Group Name: Hamburger Haters

Ayesha Andrews, Zoe Balback, Michelle Du, Jessica Kwong, Chaela Lim, Jessica Lu, Anna Visser

Abstract

In this study, we aimed to explore how adding a plant-based protein label on a restaurant menu affects consumer food choices. We hypothesized that adding a plant-based protein label to pre-existing climate labels would increase the selection of plant-based items. In a between-subjects design, randomly assigned participants (N = 753) were asked to select an item from a menu with climate labels only (control condition) or climate and protein labels (experimental condition). The results revealed no significant difference in the overall sample (p = .41), suggesting that the protein label alone did not influence food choice in the general population. However, when analyzing only University of British Columbia (UBC) affiliated participants (N = 205), a significant difference was found (p = .03). Exploratory analyses also revealed a strong correlation between participants' beliefs about plant-based protein and their likelihood of selecting plant-based items (p < .001). No relationships were observed between gender or climate beliefs and plant-based food selection. Results suggest that perception about the protein content of plant-based foods is related to food choice, and protein labels may increase the uptake of plant-based food items among university populations.

Introduction

The global climate crisis is the most pressing issue of our time, and actions must be taken immediately to curb greenhouse gas emissions and mitigate worsening impacts. Agri-food systems account for around one-third of global anthropogenic emissions, with a large portion due to intensive animal agriculture (FAO, 2024). Thus, one of the most effective and accessible ways an individual can reduce their carbon emissions is through simple dietary changes away from animal-based foods (Scarborough et al., 2014). Research has shown that an effective way to influence consumers' uptake of plant-based foods is carbon labelling; however, shifting perceptions about the protein content of plant-based foods remains a hindrance to widespread adoption (Abebe, 2024; Feucht & Zander, 2018; Macdonald, 2023). While protein labels have proven effective in encouraging plant-based chilli consumption in a simulated grocery setting, it remains unclear if this applies to restaurant menu items (Macdonald, 2023). Additionally, research has failed to address whether the combination of a protein label and a climate label would effectively increase the uptake of plant-based food items.

Research Question

How does highlighting plant-based protein content of menu items influence food choice?

Hypothesis

Adding a “plant-based protein” label to UBC’s existing climate labels on plant-based food will result in an increase in plant-based items being ordered, compared to using climate labels alone.

Method

Participants

Based on a power analysis conducted for a 2x2 chi-square test, we needed a minimum of 197 participants to detect a small to medium effect size of phi = 0.2, at $\alpha = 0.05$ and power level = .80. A total of 915 responses were recorded. After data cleaning, the final count was N = 753. Criteria for exclusion included incomplete responses to mandatory questions, participants under 18 years old or older than 85 years old, and illogical or invalid responses to demographic questions.

The average age was 24.83 years (SD = 9.65). The majority of participants were men (n = 388, 51.53%), followed by women (n = 288, 30.28%), and non-binary individuals (n = 13, 1.73%). In terms of dietary habits, the majority of participants were omnivores (n = 627, 83.27%), with under 5% indicating they were vegetarian, vegan, or pescatarian. See Appendix A for more details.

Of the 753 participants, 205 indicated they are currently affiliated with UBC as either a student (n = 197, 26.16%) or faculty/staff member (n = 8, 1.06%). We chose to do a separate

analysis on UBC-affiliated participants to provide more relevant results for our SEEDs clients, whose main focus is increasing sustainability operations on the UBC campus. See Appendix A for more details.

Conditions

Our study examined two independent variables. The first independent variable was the type of menu labels presented to participants, operationalized through two randomly assigned conditions for a between-subjects design. In the control condition (n = 382), participants viewed a menu featuring "climate" icons that indicated the relative levels of greenhouse gas (GHG) emissions associated with each menu item. The menu was adapted from a pre-existing resource developed as part of the SEEDS Sustainability Program's Climate-Friendly Food (CFF) labels (UBC Sustainability, 2022). In the experimental condition (n = 371), participants were presented with the same menu but with the addition of a "plant-based protein" label that was only applied to low-GHG, plant-based food items. The inclusion of both label types enabled an assessment of whether the additional protein labels would further motivate participants to select climate-friendly menu options. Examples of the CFF and protein labels can be found in Appendix C.

The second independent variable was the food choices that were provided, operationalized as either a plant-based menu item or a meat-based menu item. In total, participants could choose between eight menu items: four plant-based and four meat-based items. Given the presence of both food types, food choice functioned as a within-subjects variable.

Measures

The primary dependent variable, consumer food choice, was operationalized as the number of participants selecting each menu item, which was coded as plant-based or meat-based. To measure demographics, participants' climate change beliefs, plant-based protein beliefs, dietary habits, age, gender, and UBC affiliation were collected.

We used Fairbrother et al. (2019) validated 3-item scale measuring climate beliefs. The items were: (1) "Do you think the earth's climate is changing?" with options ranging from "definitely not changing" to "definitely changing", coded on a four-point scale so that higher values indicate stronger beliefs that the climate is changing. (2) "Do you think climate change is caused by natural processes, human activity, or both?" with response options ranging from "entirely natural processes" to "entirely human processes" which was coded on a 5-point scale, with higher values indicating stronger confidence in the anthropogenic character of climate change, and (3) "How good or bad do you think the impacts of climate change will be across the world?" measured on a 10-point response scale with options ranging from "extremely bad" to "extremely good", so that higher values indicate stronger beliefs in the adverse effects of climate change. To determine climate belief scores, we calculated the geometric mean across the responses, yielding possible scores ranging from 1.00 to 5.85 (Fairbrother et al., 2019).

To measure plant-based protein beliefs, participants were asked to indicate their agreement with the statement "Plant-based foods can be a good source of protein" using a 7-

point Likert scale ranging from “strongly disagree” to “strongly agree”, with the former option coded as ‘1’ and the latter option coded as ‘7’.

Procedure

Data was collected using the online survey platform Qualtrics over a 13-day period, from March 6 to March 18, 2025. Recruitment was conducted through a combination of digital and physical channels, including sharing on social media platforms (e.g., Facebook groups, Instagram stories, Discord servers) and putting up posters in high-traffic areas on the UBC Vancouver campus. Upon providing informed consent, participants were randomly assigned to one of two conditions. In the control condition, participants viewed a menu featuring eight food items labeled only with climate icons indicating relative GHG emissions. In the experimental condition, the same menu included both climate labels and additional “plant-based protein” labels on relevant items. Participants were then asked to select the item that they would order. Subsequent sections of the survey included measures of climate change beliefs, perceptions of plant-based protein, dietary habits, UBC affiliation, age, and gender. No major challenges were encountered during data collection.

Results

Main Analysis

All statistical analyses were conducted using the program JASP (Version 0.19.3). A chi-square test was conducted to examine whether or not there was an association between labelling conditions and participants’ choice of food. All chi-square assumptions were met, including two categorical variables, independence of observations, and expected cell frequencies greater than five. There was no statistically significant association between labelling conditions and food choice, $X^2(1) = 0.68$, $p = .41$, $\phi = 0.03$. The effect size was trivial. Thus, differences between conditions were likely due to random chance, and our hypothesis is not supported. See Appendix E for more details.

We repeated the analysis with only UBC-affiliated participants’ responses. All chi-square assumptions were met, and the number of participants still achieved the quota according to the power analysis initially conducted. There was a statistically significant association between labelling conditions and food choice for this sample, $X^2(1) = 5.00$, $p = .03$, $\phi = 0.16$. There was a small effect size. These results suggest that plant-based protein labels have a small effect on UBC-affiliated individuals’ decisions to order plant-based foods, and our hypothesis is supported. See Appendix E for more details.

Exploratory Analysis

We were interested to see whether gender was related to the effectiveness of the protein label on food choices. We decided to look at men and women since they achieved the required

sample size and theorized that men might be more likely than women to be influenced by the protein label's flexing arm visual. Separate chi-square tests were conducted. The results showed that for both men and women, there were no statistically significant associations between labelling conditions and food choice, $X^2(1) = 0.20$, $p = .65$, $\phi = 0.02$ and $X^2(1) = 1.95$, $p = .16$, $\phi = 0.08$ respectively. See Appendix F for more details.

Additionally, we were interested to see whether participants' climate change beliefs were related to the type of food ordered and theorized that those with more progressive beliefs would be more likely to order plant-based foods. Our results showed that there was no significant relationship between climate change beliefs and food choice, $r_B = 0.06$, $p = .22$.

Lastly, we were interested to see whether participants' beliefs that plant-based foods could be a good source of protein was related to the type of food participants ordered. Our results showed that there was a significant relationship and medium effect size between plant-based protein beliefs and food choice, where participants who ordered plant-based food items scored higher compared to those who ordered meat-based items, $r_B = 0.30$, $p < .001$.

Discussion

Summary

Contrary to our hypothesis, adding a plant-based protein label to menu items did not affect the general population of participants' food choices. However, our hypothesis is supported when analysing the UBC-affiliated population. This suggests that plant-based protein labels may be an effective intervention to decrease GHG emissions and meet UBC's sustainability goals of reducing scope 3 emissions, but does not generalize beyond a university population (UBC Sustainability, 2022). More investigation is needed to determine why plant-based protein labels were effective for UBC-affiliated populations and not the general population.

While our exploratory analyses revealed no relationship between gender and the effectiveness of our intervention, or climate beliefs and food choice, a correlation between plant-based food choice and perception of protein in plant-based items was observed.

Implications

Compared to prior research on a protein label to increase plant-based chilli consumption, our research does not show that a protein label on plant-based foods increases uptake when applied to menus with more food choices (Macdonald, 2023). Our findings echo previous research on the difficulty of increasing the uptake of plant-based foods despite sustainability benefits (Abebe, 2024). Our exploratory analyses suggest that there is a relationship between perception of protein in plant-based food items and selection of plant-based food from a menu, and thus could hold potential for increasing plant-based food uptake.

Limitations

While we found significant results for UBC participants, this was not present in our entire sample. For this reason, our data is not generalizable beyond university populations.

Additionally, we opted to use an online survey, which could have resulted in participants selecting a menu item that is inconsistent with their order in a real-world situation. Furthermore, due to our convenience sampling methods, our sample is unlikely to be representative of real-world populations, further limiting the generalizability of our findings.

Finally, the inclusion of a plant-based protein label on menus may contribute to information overload for customers. In our mock-up menus, we removed all labels other than the climate labels (e.g., vegan, gluten-free, vegetarian) to eliminate clutter that might interfere with our manipulation. For real world food outlets, the addition of a plant-based protein label to menus may not be feasible when taking into consideration limited menu space and aesthetics.

Future Research

Future research should gather more data on representative populations to examine if plant-based protein labels can be an effective intervention to increase plant-based food popularity. Field research should be applied to our findings to see if plant-based protein labels impact real-world sales data, while also evaluating the potential for menu overcrowding. Research should also be done on designing and testing the most effective plant-based protein label in terms of visual appeal and definition of plant-based protein.

Recommendations for SEEDS

Based on a sample drawn exclusively from the UBC population, our findings indicate that labeling strategies that emphasize protein content can effectively increase the uptake of plant-based food options. This highlights protein labeling as a promising and targeted intervention for SEEDS, which aims to foster sustainability initiatives within the UBC community and its aim to promote behavioural change on campus.

To build on these results, we recommend that SEEDS conduct further research to determine whether our findings translate into actual consumer behaviour. This could be achieved by implementing protein labels in UBC food outlets and analysing resulting sales data.

Moreover, we recommend researching what an optimal plant-based protein label would be. The current study used a basic muscle emoji, but future research should explore alternative designs, such as incorporating icons, improved visuals, or clearer language, to identify which version is most clear and effective.

Beyond labeling, SEEDS could enhance awareness of plant-based protein by incorporating educational materials in dining spaces or on UBC food outlet websites. Since our exploratory results suggest that attitudes toward plant-based protein are associated with the likelihood of choosing plant-based meals, increasing visibility and understanding of these foods may further encourage sustainable food choice.

References

Abebe, G. K., Ismail, M. R., Kevany, K., Haileslassie, H. A., Young, L., & Pauley, T. (2024). Factors influencing intentions to transition to plant-based protein diets: Canadian perspective. *Food Science & Nutrition, 12*(11), 8903-8919. https://doi.org/10.1002/fsn3.4436

Climate-Friendly Food Labels. (n.d.). UBC Sustainability. https://sustain.ubc.ca/climate-friendly-food-labels

Fairbrother, M., Johansson Sevä, I., & Kulin, J. (2019). Political trust and the relationship between climate change beliefs and support for fossil fuel taxes: Evidence from a survey of 23 European countries. *Global Environmental Change, 59*, 102003. https://doi.org/10.1016/j.gloenvcha.2019.102003

FAO (2024). Greenhouse gas emissions from agrifood systems: Global, regional and country trends, 2000–2022. FAO. https://openknowledge.fao.org/handle/20.500.14283/cd3167en

Feucht, Y., & Zander, K. (2018). Consumers' preferences for carbon labels and the underlying reasoning. A mixed methods approach in 6 European countries. *Journal of Cleaner Production, 178*, 740-748. https://doi.org/10.1016/j.jclepro.2017.12.236

Gallery Patio and Lounge. (2024, November). Gallery Menu. AMS website. https://www.ams.ubc.ca/wp-content/uploads/2025/01/Jan-2025-Gallery-Menu.pdf

JASP Team (2024). JASP (Version 0.19.3)[Computer software].

Macdonald, C. (2023). 'Plant-based' versus 'vegan' & 'high protein' versus 'low carbon': Exploring situational myth-busting, product labels, and green nudges that increase sustainable meal choices. *Research in Psychology and Behavioral Sciences, 11*(1), 7-11.

Scarborough, P., Appleby, P. N., Mizdrak, A., Briggs, A. D. M., Travis, R. C., Bradbury, K. E., & Key, T. J. (2014). Dietary greenhouse gas emissions of meat-eaters, fish-eaters, vegetarians and vegans in the UK. *Climatic Change, 125*(2), 179-192. https://doi.org/10.1007/s10584-014-1169-1

UBC Sustainability. (2022, November 2). *GHG Inventory*. sustain.ubc.ca. https://sustain.ubc.ca/campus/climate-action/ghg-inventory

UBC Sustainability. (2024, August 14). *Climate-friendly food labels*. sustain.ubc.ca. https://sustain.ubc.ca/climate-friendly-food-labels

Appendix A: Participant Demographics

Table A1. Age demographics of total participants

What is your age (in years)?	
Valid	688
Missing	65
Mode	20.000[a]
Median	21.000
Mean	24.831
Std. Deviation	9.649
Minimum	18.000
Maximum	78.000

[a] The mode is computed assuming that variables are discreet.

Table A2. Gender demographics of total participants

What is your gender identity?	Frequency	%	Valid %	Cumulative %
Woman	228	30.279	32.340	32.340
Man	388	51.527	55.035	87.376
Non-binary person	13	1.726	1.844	89.220
Other	62	8.234	8.794	98.014
Prefer not to answer	14	1.859	1.986	100.000
Missing	48	6.375		
Total	753	100.000		

Table A3. UBC affiliation of total participants

Are you currently affiliated with UBC?	Frequency	%	Valid %	Cumulative %
Yes, I'm a UBC student.	197	26.162	27.786	27.786
Yes, I'm a UBC faculty/staff.	8	1.062	1.128	28.914
No.	504	66.932	71.086	100.000
Missing	44	5.843		
Total	753	100.000		

Table A4. Eating habits of total participants

How would you classify your eating habits?	Frequency	%	Valid %	Cumulative %
Vegan (no animal products)	3	0.398	0.422	0.422
Vegetarian (no meat or seafood)	19	2.523	2.672	3.094
Pescatarian (no meat, but eating seafood)	11	1.461	1.547	4.641
Mostly plant-based / vegetarian	19	2.523	2.672	7.314
Omnivore (animal and plant products)	627	83.267	88.186	95.499
Other	32	4.250	4.501	100.000
Missing	42	5.578		
Total	753	100.000		

Table A5. Climate belief scores of total participants

	Climate Belief Score	
	Meat	Plant-based
Valid	562	160
Missing	20	11
Mode	5.241	5.241
Median	5.040	5.085
Mean	4.760	4.189
Std. Deviation	0.854	0.869
MAD	0.389	0.344

Note. The mode is computed assuming that variables are discrete.

Table A6. Protein belief scores of total participants

	Plant-Based Protein Belief Score	
	Meat	Plant-based
Valid	562	160
Missing	20	11

Mode	5.000	6.000
Median	5.000	5.000
Mean	4.320	5.169
Std. Deviation	1.684	1.514

Note. The mode is computed assuming that variables are discrete.

Table A7. Age demographics of UBC-affiliated participants

What is your age (in years)?	
Valid	202
Missing	3
Mode	20.000[a]
Median	21.000
Mean	21.817
Std. Deviation	6.240
Minimum	18.000
Maximum	73.000

[a] The mode is computed assuming that variables are discreet.

Table A8. Gender demographics of UBC-affiliated participants

What is your gender identity?	Frequency	%	Valid %	Cumulative %
Woman	92	44.878	44.878	44.878
Man	93	45.366	45.366	90.244
Non-binary person	7	3.415	3.415	93.659
Other	5	2.439	2.439	96.098
Prefer not to answer	8	3.902	3.902	100.000
Total	205	100.000		

Table A9. UBC affiliation of UBC-affiliated participants

Are you currently affiliated with UBC?	Frequency	%	Valid %	Cumulative %
Yes, I'm a UBC student.	197	96.098	96.098	96.098
Yes, I'm a UBC faculty/staff.	8	3.902	3.902	100.000
Total	205	100.000		

Table A10. Eating habits of UBC-affiliated participants

How would you classify your eating habits?	Frequency	%	Valid %	Cumulative %
Mostly plant-based / vegetarian	8	3.902	3.902	3.902
Omnivore (animal and plant products)	167	81.463	81.463	85.366
Other	13	6.341	6.341	91.707
Pescatarian (no meat, but eating seafood)	5	2.439	2.439	94.146
Vegan (no animal products)	2	0.976	0.976	95.122
Vegetarian (no meat or seafood)	10	4.878	4.878	100.000
Total	205	100.000		

Appendix B: Qualtrics Survey

Q1.1

Consent Form
Class Research Projects in PSYC 421 - Environmental Psychology

Department of Psychology
University of British Columbia
Vancouver, BC, V6T 1Z4
Phone: 604.822.2755
Fax: 604.822.6923

Principal Investigator: Dr. Jiaying Zhao
Course Instructor
Department of Psychology
Institute for Resources, Environment and Sustainability
Email: jiayingz@psych.ubc.ca

Introduction and Purpose
Students in the PSYC 421 – Environment Psychology class are required to complete a research project on the UBC campus as part of their course credit. In this class, students are required to write up a research proposal, conduct a research project, collect and analyze data, present their findings in class, and submit a final report. Their final reports will be published on the SEEDS online library (https://sustain.ubc.ca/teaching-applied-learning/seeds-sustainability-program). Their projects include online or in-person surveys and experiments on a variety of sustainability topics, such as waste sorting on campus, student health and well-being, food consumption and diet, transportation, biodiversity perception, and exercise habits. The goal of the project is to train students to learn research techniques, how to work in teams and with UBC clients selected by the UBC SEEDS (Social Ecological Economic Development Studies) program.

Study Procedures
If you agree to participate, the study will take 5-10 minutes of your time. You will answer a few questions in the study. The data will be strictly anonymous. Your participation is entirely voluntary, and you can withdraw at any point without any penalty. Your data in the study will be recorded (e.g., any answer you give) for data analysis purposes. If you are not sure about any instructions, please do not hesitate to ask. Your data will only be used for student projects in the class. There are no risks associated with participating in this experiment.
Confidentiality: Your identity will be kept strictly confidential. All documents will be identified only by code numbers. No personally identifying information will be collected. Data that will be kept on a computer hard disk will also be identified only by code numbers and will be encrypted and password-protected so that only the principal investigator, the course instructor, Dr. Jiaying Zhao, and the teaching assistants will have access to it. Following the completion of the study, the data will be transferred to an encrypted and password-protected hard drive and stored in a

locked filing cabinet. Please note that the results of this study will be used to write a report which will be published on the SEEDS library.

Remuneration
There is no remuneration for your participation.

Contact for information about the study
This study is being conducted by Dr. Jiaying Zhao, the principal investigator. Please contact her if you have any questions about this study. Dr. Zhao may be reached at (604) 827-2203 or jiayingz@psych.ubc.ca.

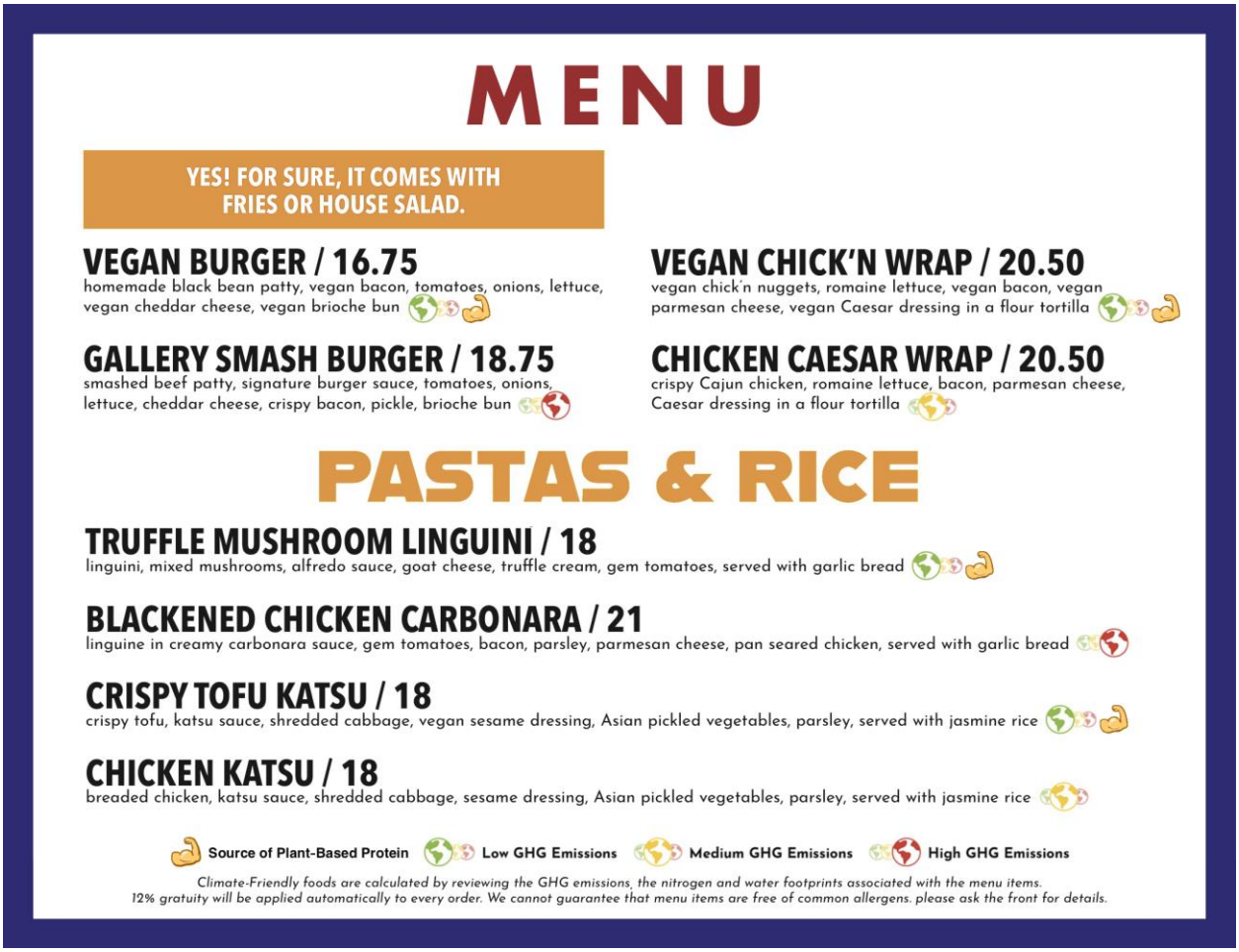
Contact for concerns about the rights of research subjects
If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or if long distance, e-mail RSIL@ors.ubc.ca or call toll-free 1-877-822-8598.

Consent: Your participation in this study is entirely voluntary, and you may refuse to participate or withdraw from the study at any time. You also may postpone your decision to participate for 24 hours. You have the right to choose not to answer some or any of the questions. By clicking the "continue" button, you are indicating your consent to participate; hence, your signature is not required. The researchers encourage you to keep this information sheet for your records. Please feel free to ask the investigators any additional questions that you have about the study.

Ethics ID: H17-02929

Climate + Protein labels condition

Q2.1 Imagine you are a student at the University of British Columbia. You stop by a restaurant on campus to grab a bite to eat. Please consider the menu below:

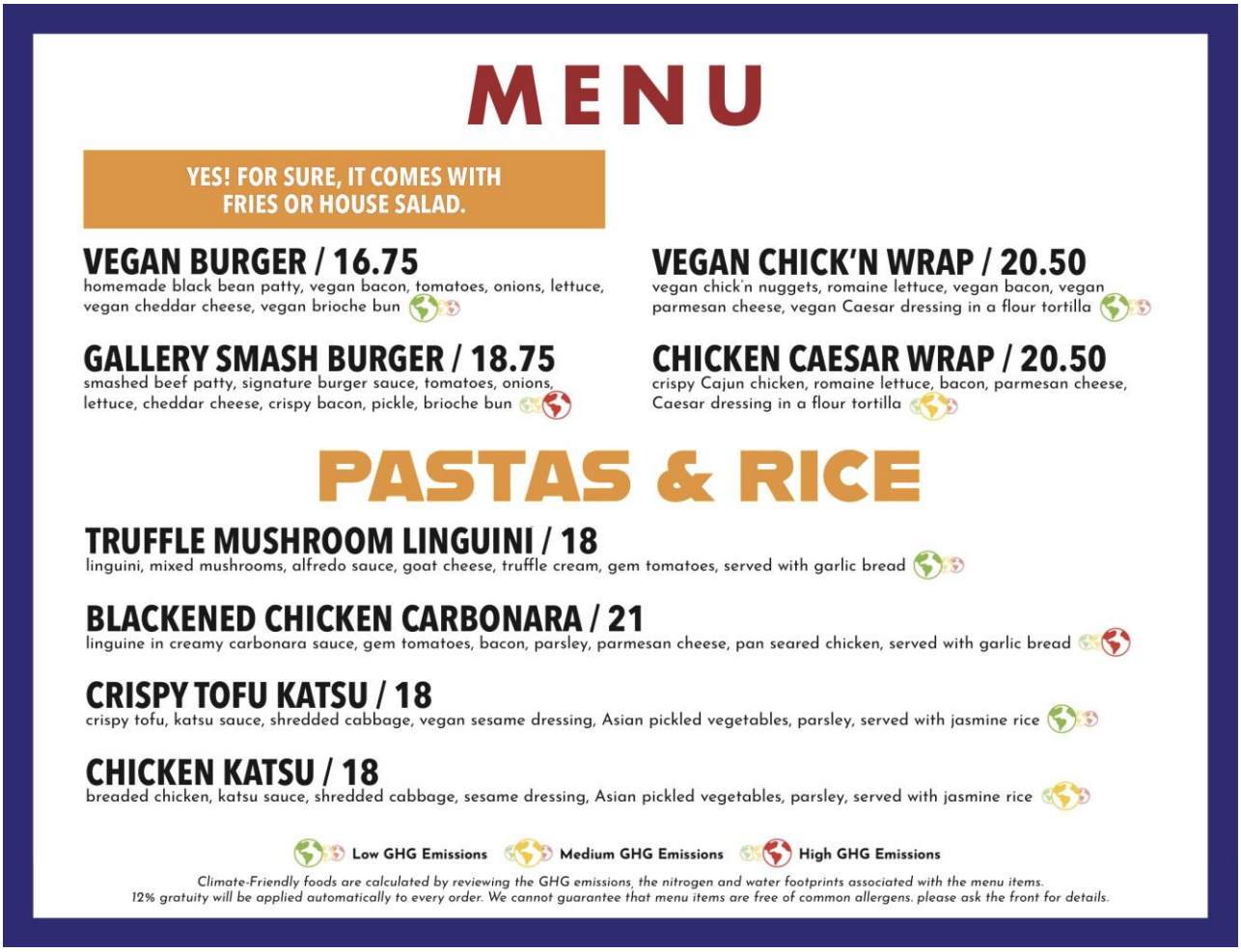


Q2.2 What would you order?

- o Vegan Burger (1)
- o Gallery Smash Burger (2)
- o Vegan Chick'n Wrap (3)
- o Chicken Caesar Wrap (4)
- o Truffle Mushroom Linguini (5)
- o Blackened Chicken Carbonara (6)
- o Crispy Tofu Katsu (7)
- o Chicken Katsu (8)

Climate Labels only condition

Q3.1 Imagine you are a student at the University of British Columbia. You stop by a restaurant on campus to grab a bite to eat. Please consider the menu below:



Q3.2 What would you order?

o Vegan Burger (1)
o Gallery Smash Burger (2)
o Vegan Chick'n Wrap (3)
o Chicken Caesar Wrap (4)
o Truffle Mushroom Linguini (5)
o Blackened Chicken Carbonara (6)
o Crispy Tofu Katsu (7)
o Chicken Katsu (8)

Climate Questions Block

Q4.1 Do you think the earth's climate is changing?

o Definitely not changing (1)
o Somewhat not changing (2)
o Somewhat changing (3)
o Definitely changing (4)

Q4.2 Do you think climate change is caused by natural processes, human activity, or both?
- o Entirely by natural processes (1)
- o Mostly natural processes (2)
- o Equally natural and human processes (3)
- o Mostly human processes (4)
- o Entirely by human processes (5)

Q4.3 How good or bad do you think the impacts of climate change will be across the world?
- o Extremely good (1)
- o Very good (2)
- o Good (3)
- o Somewhat good (4)
- o Little bit good (5)
- o Little bit bad (6)
- o Somewhat bad (7)
- o Bad (8)
- o Very bad (9)
- o Extremely bad (10)

Q4.4 Plant-based foods can be a good source of protein.
- o Strongly disagree (1)
- o Disagree (2)
- o Somewhat disagree (3)
- o Neither agree nor disagree (4)
- o Somewhat agree (5)
- o Agree (6)
- o Strongly agree (7)

Demographic Questions Block

Q4.5 How would you classify your eating habits?
- o Vegan (no animal products) (1)
- o Vegetarian (no meat or seafood) (2)
- o Pescatarian (no meat, but eating seafood) (3)
- o Mostly plant-based / vegetarian (4)
- o Omnivore (animal and plant products) (5)
- o Other (6) _____

Q5.1 Are you currently affiliated with UBC?
- o Yes, I'm a UBC student. (1)
- o Yes, I'm a UBC faculty/staff. (2)
- o No. (3)

Q5.2 What is your age (in years)?

_____

Q5.3 What is your gender identity?

o Woman (1)
o Man (2)
o Non-binary person (3)
o Prefer not to answer (4)
o Other (5) _____

Q5.4 Do you have lived experience as a trans person (meaning your gender identity does not align with your gender assigned at birth)?

o Yes (1)
o No (2)
o Prefer not to answer (3)

Appendix C: Climate and Protein Labels

Figure C1. UBC SEEDS' Climate-Friendly Food Labels

Figure C2. Plant-based Protein Label.

Appendix D: Participant Recruitment Poster

Figure D. Participant recruitment poster.

Appendix E: Main Statistical Analyses

Table E1. Chi-square assumption test for expected counts greater than five, using total participant data.

		Condition		
Food Choice		Climate Only	Protein+Climate	Total
Meat	Count	300.000	282.000	582.000
	Expected count	295.251	286.749	582.000
Plant-based	Count	82.000	89.000	171.000
	Expected count	86.749	84.251	171.000
Total	Count	382.000	371.000	753.000
	Expected count	382.000	371.000	753.000

Table E2. Chi-square test using total participant data, including the contingency table, chi-square value, and effect size.

		Condition		
Food Choice		Climate Only	Protein+Climate	Total
Meat	Count	300	282	582
	% within row	51.546 %	48.454 %	100.000 %
	% within column	78.534 %	76.011 %	77.291 %
Plant-based	Count	82	89	171
	% within row	47.953 %	52.047 %	100.000 %
	% within column	21.466 %	23.989 %	22.709 %
Total	Count	382	371	753
	% within row	50.730 %	49.270 %	100.000 %

	% within column	100.000 %	100.000 %	100.000 %

	Value	df	p
X^2	0.683	1	0.409
Phi-coefficient	0.030		
N	753		

Table E3. Chi-square assumption test for expected counts greater than five, using only UBC-affiliated participant data.

		Condition		
Food Choice		Climate Only	Protein+Climate	Total
Meat	Count	88.000	60.000	148.000
	Expected count	80.859	67.141	148.000
Plant-based	Count	24.000	33.000	57.000
	Expected count	31.141	25.859	57.000
Total	Count	112.000	93.000	205.000
	Expected count	112.000	93.000	205.000

Table E4. Chi-square test using only UBC-affiliated participant data, including the contingency table, chi-square value, and effect size.

		Condition		
Food Choice		Climate Only	Protein+Climate	Total
Meat	Count	88	60	148
	% within row	59.459 %	40.541 %	100.000 %
	% within column	78.571 %	64.516 %	72.195 %

Plant-based	Count	24	33	57
	% within row	42.105 %	57.895 %	100.000 %
	% within column	21.429 %	35.484 %	27.805 %
Total	Count	112	93	205
	% within row	54.634 %	45.366 %	100.000 %
	% within column	100.000 %	100.000 %	100.000 %

	Value	df	p
X^2	5.000	1	0.025
Phi-coefficient	0.156		
N	753		

Appendix F: Exploratory Analysis: Gender

Table F1. Chi-square test using only men's response data, including the contingency table, chi-square value, and effect size.

		Condition		
Food Choice		Climate Only	Protein+Climate	Total
Meat	Count	170	155	325
	% within row	52.308 %	47.692 %	100.000 %
	% within column	84.577 %	82.888 %	83.763 %
Plant-based	Count	31	32	63
	% within row	49.206 %	50.794 %	100.000 %
	% within column	15.423 %	17.112 %	16.237 %
Total	Count	201	187	388
	% within row	51.804 %	48.196 %	100.000 %
	% within column	100.000 %	100.000 %	100.000 %

	Value	df	p
X^2	0.203	1	0.652
Phi-coefficient	0.023		
N	388		

Table F2. Chi-square test using only women's response data, including the contingency table, chi-square value, and effect size.

		Condition		
Food Choice		Climate Only	Protein+Climate	Total
Meat	Count	86	130	216
	% within row	39.815 %	60.185 %	100.000 %
	% within column	72.881 %	65.327%	68.139 %

Plant-based	Count	32	69.000	101
	% within row	31.683%	68.317 %	100.000 %
	% within column	27.119%	34.673%	31.861 %
Total	Count	118	199	317
	% within row	37.224 %	62.776%	100.000 %
	% within column	100.000 %	100.000 %	100.000 %

	Value	df	p
X^2	1.947	1	0.163
Phi-coefficient	0.078		
N	317		

Appendix G: Menu Items Ordered

Figure I1. Bar graph depicting the number times each menu item was ordered across conditions.

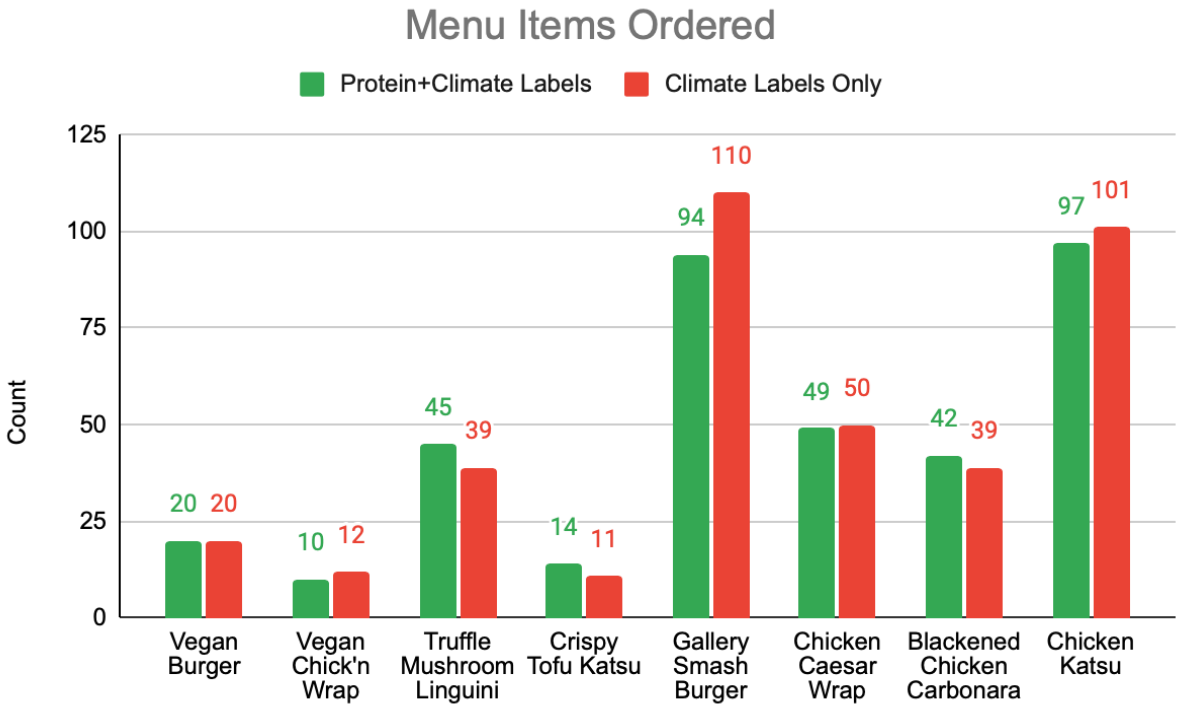


Figure I2. Pie charts depicting the percentage and number times each food type was ordered across conditions (total participants).

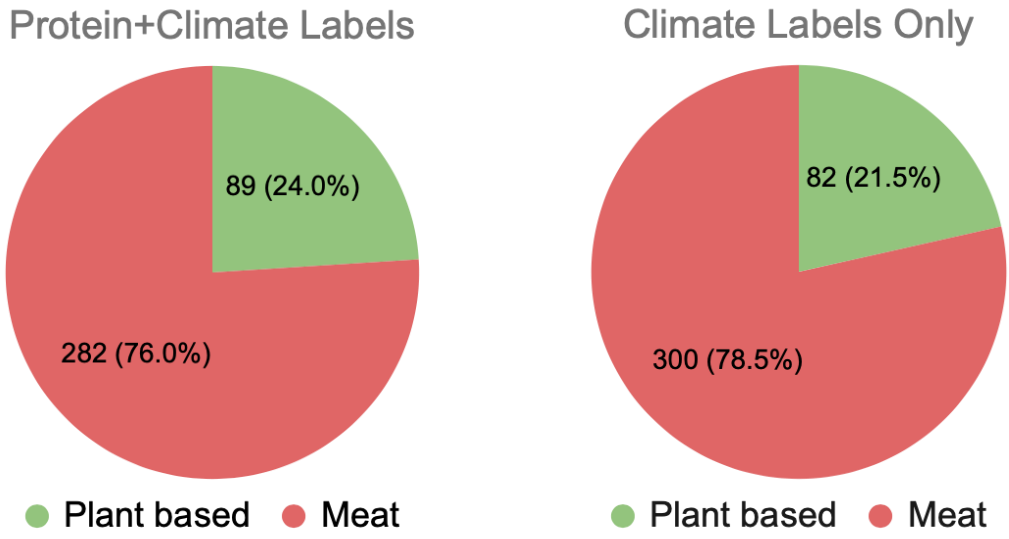
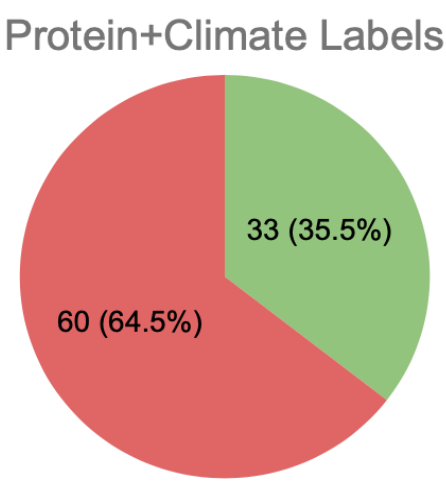
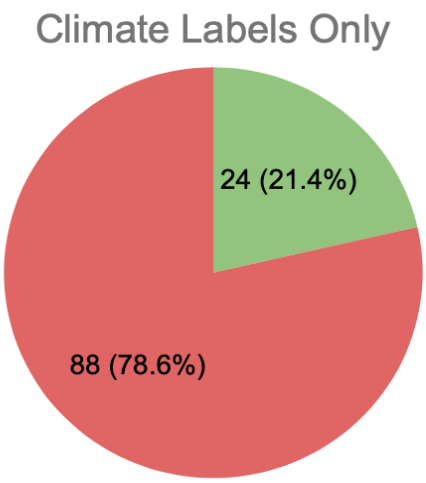


Figure I3. Pie charts depicting the percentage and number times each food type was ordered across conditions (UBC-affiliated participants).


Protein+Climate Labels
33 (35.5%)
60 (64.5%)


Climate Labels Only
24 (21.4%)
88 (78.6%)

Appendix H: Team Member Contributions

Ayesha Andrews

During the proposal stage, Ayesha conducted a literature review and helped refine our research question. She wrote the section on background literature and met with the T.A. for feedback on our proposal. For data collection and analysis, Ayesha created the Qualtrics survey, helped put up posters and recruit on social media, and cleaned our data according to our exclusion criteria. As for the presentation, Ayesha presented and created the implications and recommendations slides. For the final report, Ayesha was responsible for literature review, discussion, and references, and edited all of the sections.

Jessica Lu

Jessica was the primary contributor to data analysis and one of the presentation speakers. During the proposal stage, she determined the appropriate statistical test and target sample size for our main analysis. She wrote the corresponding sections in the proposal. Jessica helped write the survey questions along with Ayesha and Zoe. She also created both the protein icon and adapted the menu mock-ups. For data collection, she helped put up posters around campus in addition to reposting on social media. During our presentation, she presented the slides on statistical analyses and preliminary findings. For the final report, Jessica wrote the sections on participants and results and formatted the majority of the appendices.

Zoe Balback

Zoe was our point-of-contact with our SEEDS client and a presentation speaker. She wrote the measures section in our proposal and worked with Ayesha and Jessica on the survey. Moreover, she recruited some of our older, non-UBC respondents by posting on Facebook communities. As a speaker, she presented the slides on hypothesis, demographics, conditions and measures. As for the final report, Zoe was responsible for writing the discussion section and doing the proofreading.

Chaela Lim

Chaela recruited the majority of our 753 participant pool with her social media outreach. For the proposal, she wrote the research question and the hypothesis. Chaela worked with Michelle to create a participant recruitment poster, writing the text for the poster. Along with Jessica Kwong, Chaela helped choose a suitable template for our presentation and ensured slides were clear and concise, and added images. She finalized the research question and hypothesis for the presentation. While writing our final report, she was responsible for the title page, the executive summary, and research question and hypothesis. She edited and proofread the final report.

Michelle Du

Michelle wrote the conditions section for the proposal. She created a poster for participant recruitment on Canva, picked up the printed posters from SEEDS and distributed them among the team for putting up posters. Along with Anna and Jessica Kwong, Michelle helped input visuals and content onto the slides. She wrote the speaker notes for the presenters and created the data visuals in the demographics slide. For the final report, she formatted the report and wrote the appendices section.

Anna Viser

Anna was the one who informed the team about the Climate-Friendly Food labels recently implemented at the Gallery, whose menu we used for our study. She wrote the sample size section in the proposal and helped input content onto slides and suggested changes to other group members' parts to make sure we followed the presentation rubric. For the final report, she drafted and made final edits to the procedures and conditions sections.

Jessica Kwong

Jessica was responsible for writing the measures section in the proposal. For data collection, she helped put up posters around campus in addition to reposting on social media. For the presentation, she inputted the information onto the slides and wrote the measures and recommendations sections in the final report.