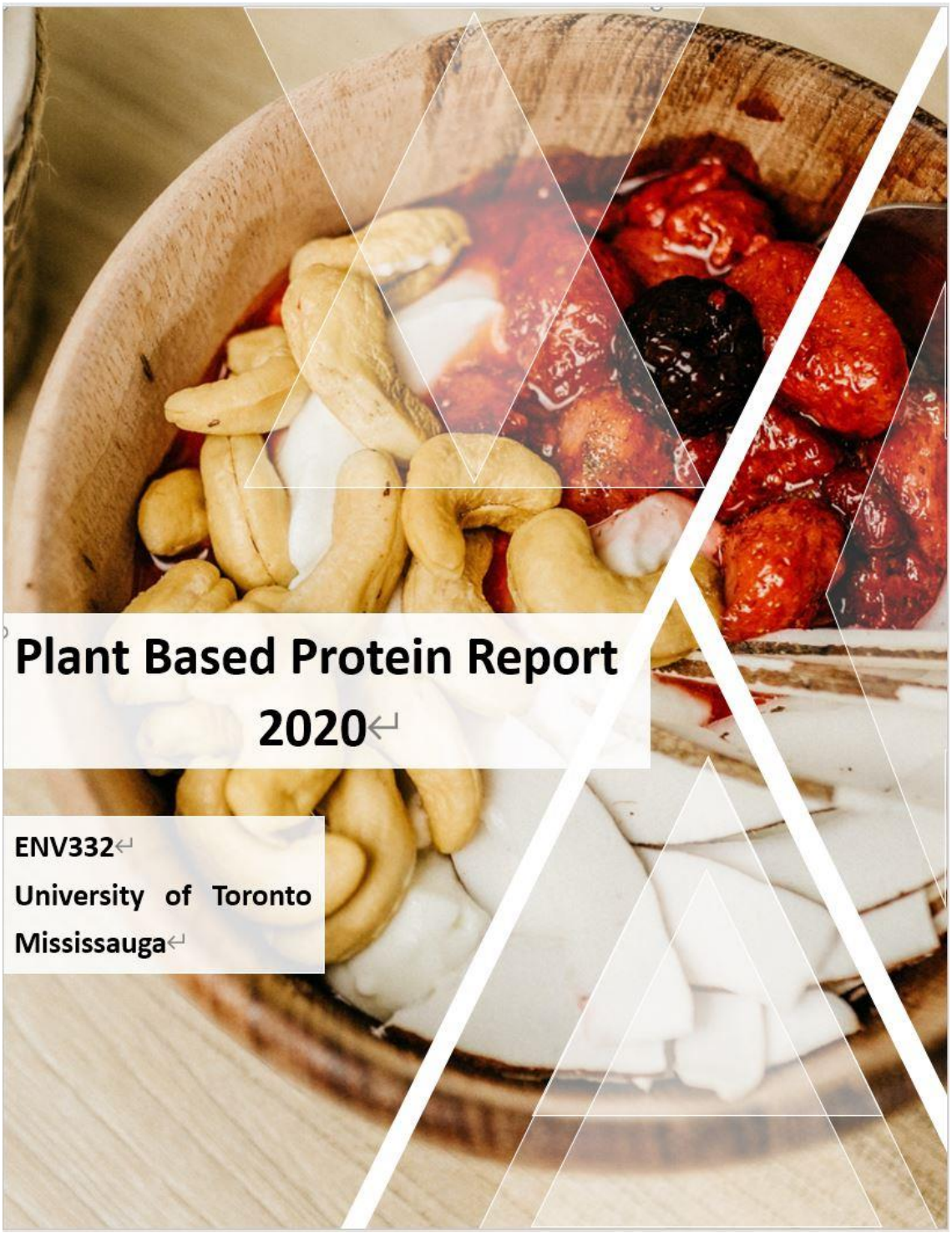
ENV332 Final Report
Group 4: Plant Based Protein



Executive Summary

Our client is UTM Hospitality and Retail Services department who is in charge of providing food, setting up meal plans and hosting events on UTM campus. They are trying to take initiative of introducing more plant-based protein options on campus, and spread awareness about sustainable and healthy food options such as plant-based protein. They gave us a project to research what UTM consumers are interested in and whether they would like to see more plant-based protein options in future menus. Our goal of this project was to give a proposal why this initiative should or should not be achieved based on our survey results and our research. If we are in favor of this initiative, we are supposed to provide recommendations on how to achieve this efficiently and successfully.

For our investigation, we conducted a survey on campus to see what consumers' attitudes are towards Plant based proteins. We decided that if more than 50% of the UTM consumers are not interested in Plant based protein, then our recommendation will be against this initiative. If more than 50% of the UTM consumers are interested, then we will provide recommendations for this initiative with details to help our client to meet this goal. Our survey results show that 92% of the UTM consumers who took the survey take protein at least once a day, 76.8% of them are interested in having Plant based protein and would like to see more Plant based options on UTM campus. 63% of the UTM consumers think that Plant based option is a healthier substitute for meat and 82% of them are willing to skip meat once or twice in a week for Plant-based protein. However, 56% of the consumers have not seen advertisements on plant-based protein at UTM and 67% of them have never had plant-based protein at UTM. Based on the consumers' interest, we decided to make a proposal in favor of this initiative and provide recommendations on achieving this goal. We investigated UTM's current vegan,

vegetarian and plant-based protein options and compared that with York University, Humber College, the University of Guelph's vegan, vegetarian and plant-based protein options. We found out that UTM menus lack variety and protein alternatives comparatively.

Based on our survey results and our research, we are recommending UTM Hospitality and Retail Services to first start to start with advertising and promoting contents related to plant-based protein. Secondly, we are suggesting them to adopt menus from other universities that offer plant-based protein options on campus. Thirdly, we are recommending them to choose a food service provider, for next year, that already has the menu with plant-based protein options. Lastly, we are recommending them to provide nutritional data within the menus, so that students get to know the nutritional facts of each food item in the menu.

Introduction

GOAL

The UTM hospitality and Retail Services department's goal is to find out if implementing plant-based proteins would be a good option for the UTM campus, as well as raise awareness regarding health, spread a consistent message that will resonate with everyone of all diverse backgrounds that is a part of the UTM experience, and most importantly introduce environmental sustainability friendly food options.

OBJECTIVE

The main objective of our research was to find out whether to recommend the implantation of plant based proteins or not, through conducting surveys and thoroughly observing the data in order to find out what the individuals on campus are currently interested in and what they would like to see on future menus in terms of extended options for plant based proteins, so that our recommendation best suits the interest of the majority on the UTM campus.

LIMITATIONS

We were unable to engage staff's feedback and incorporate it in our findings as it was difficult to interview them while they were at work. We were also not able to meet up with our stakeholders and get their feedback due to COVID-19 that led the university to close early.

Through conducting the survey, the findings show that the majority of the individuals have a positive attitude towards plant-based proteins. According to the positive results we got back from the survey data, we have decided to recommend the department with following through with creating advertising and promoting contents related to plant based proteins and create plant-based protein options on the menus at the UTM campus. By creating more options for plant based proteins, UTM will also become more sustainable as plant based proteins are a

better choice for not just the individuals at UTM, but also for the environment. Plant based protein options on the campus menus will be another great way that UTM can practice sustainability.

Background Information

Today's society consumes meat at a rate once thought unimaginable by previous generations. This overconsumption plagues North America as well as the rest of the world and creates issues for food availability and production. The examination of this problem is even more dire when we examine how the world could possibly "supply a population of 10 billion or more people with the quantity of meat currently consumed in most high-income countries without substantial negative effects on environmental sustainability." (Godfray et al 2018: 1) Godfray's 2018 study showcased such an examination into the world's current issues surrounding meat consumption and livestock production, explaining the various effects meat consumption and livestock production has on human health as well as the environment.

They found that as an individual consumes red meat on a high intake basis, they are more at risk for colorectal cancer, and that 34,000 cancer deaths per year worldwide are linked to diets with high processed meat consumption. These diets are also at risk for diabetes as well as foodborne infections from livestock. (Godfray 2018: 4, 5) Livestock/meat production in itself produces 15% of all anthropogenic emissions and consists of carbon dioxide (CO2), methane, and nitrous oxide (N2O). Meat production results in the emissions of all three and is the single most important source of methane, contributing 0.15 giga-metric tonnes of methane to the environment annually. (2005: 4) This is 150000000 tonnes of methane.

This is further backed up by research done by Walker et al in 2005, 13 years prior echoing the same caution with meat consumption and production. They indicated that "the high level of meat and saturated fat consumption in the USA and other high income countries exceeds nutritional needs and contributes to high rates of chronic diseases such as cardiovascular disease, diabetes mellitus and some cancers." (348) Further in this same study they concluded that "the industrial agricultural system, now the predominant form of

agriculture in the USA and increasingly world-wide, has consequences for public health owing to its extensive use of fertilisers and pesticides, unsustainable use of resources and environmental pollution." (Walker 2005: 348) With all this information, the core goal of the project is to understand UTM's place when it comes to being a sustainable provider of protein for its consumers. Plant-based protein is defined as "a meaningful food source of protein which is from plants. This group can include pulses, tofu, soya, tempeh, seitan, nuts, seeds, certain grains and even peas. They allow us to get the important nutrients that come from red meat without the adverse effects. Therefore with advances in plant-based proteins, the need for an alternative to meat production must come to aid in becoming sustainable as a campus.

Problem Statement

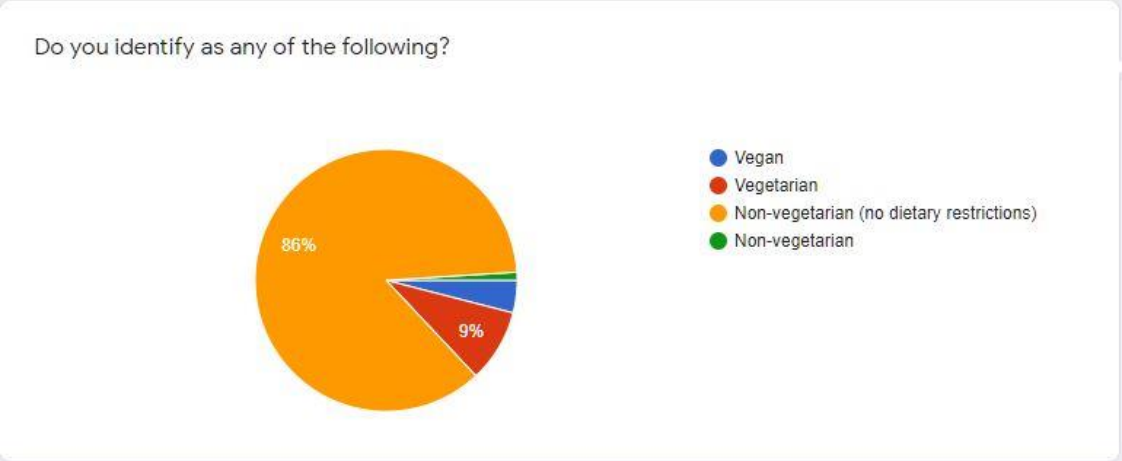
The problem that this project is aimed at is as follows;

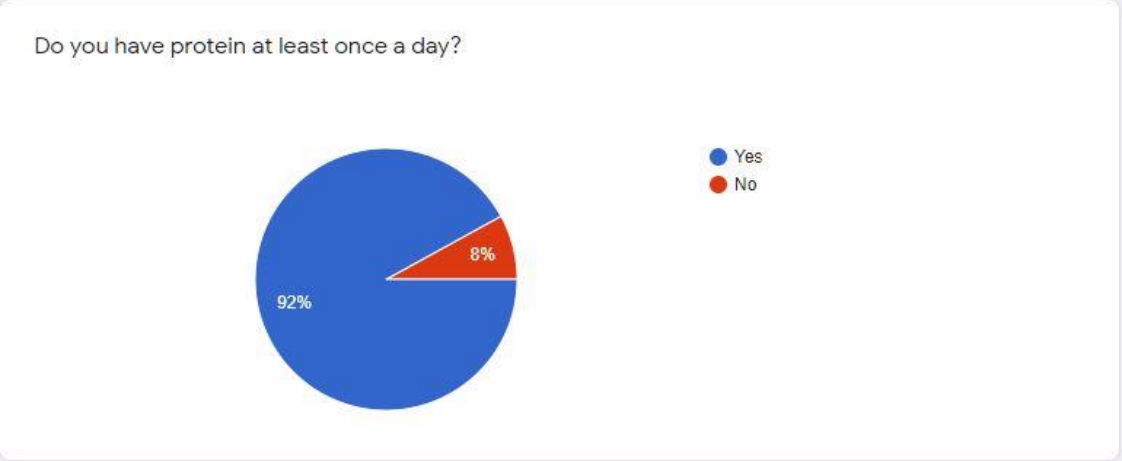
The need for UTM as a campus to become more sustainable as providers for its consumers as dietary needs and consumption rates increase in regards to offering alternatives to normal protein consumption. Namely plant-based proteins.

Methods

In order to see the student interest in having plant based protein options the group created a survey to understand student feedback. For this survey, 100 individuals that were ID'd as students were surveyed. These students were asked to participate at random from across different ethnic backgrounds and genders. We hoped that this would eliminate any interviewer bias. All individuals consented to the survey after we invited them to do so and consented for us to use their responses to help guide our project on their feedback. When it came to our inclusion/exclusion criteria, we excluded campus guests, UTM staff and faculty and chose to specifically target students as they are the primary target of the stakeholder we are working alongside. Unfortunately, due to the global pandemic of COVID19 we were unable to meet further with the stakeholder on campus after our survey and concluded to drop the additional one for campus staff as we deemed it safer and not of importance for the project.

As for the survey itself, we concluded that when surveying the number of individuals we were aiming for, that basing it quantitatively would help us eliminate response bias as much as possible. It consisted of 10 questions, of which they were neutral, not leading, and the surveyors responded anonymously which would help reduce our response bias. After the collection of our data, the team worked to analyze it statistically through the representation of graphs per question to understand significant responses to each question.





Data analysis was done primarily quantitatively as it was the basis of our surveying, as understanding the most important responses in regards to student feedback on plant-based protein options on campus was our priority. Qualitative analysis was used to examine the various other Canadian university campuses with similar programs for our research in order to understand how they implemented it and the results they gathered from their introductions.

Survey Findings

The data and findings obtained from the survey not only helped us with the formation of the recommendations, but they also allowed us to conduct an in-depth analysis of where UTM currently is with Plant based food initiatives and what are some of the challenges on the campus.

The purposes of our survey are first, to figure out what students think of Plant based food, and 2, see what kind of challenges need to be solved before our client can implement Plant based food menus on the campus. The students 'attitude toward Plant based food means everything, if the students are unanimously against Plant based food, then our suggestions to our customers will be much easier, which is not to implement Plant based food at all. Secondly, through students' opinions on UTM's Plant based food, we then can construct more targeted recommendations for our client.

The survey was conducted randomly at UTM, where a total of 100 students with different social backgrounds participated. UTM is a very cultural and ethical diverse community, the random selection of participants provides more general and unbiased feedback, in our opinion. Initially, we thought the survey should be based on Plant based food related questions, however, we found out that UTM already has many vegetarian and vegan food options upon investigation, we then shifted our focus from Plant based food to Plant based protein.

The results of the first part of our survey show that UTM students have a very positive attitude toward Plant based protein. Overall, 92% of the students who took the survey take protein at least once a day, indicating that students take protein as an important supplement to their daily meals.

More than 70% of them are interested in having Plant based protein and would like to see more Plant based options on campus. 60% of the students think that Plant based option is a healthier substitute for meat and are willing to skip meat once or twice in a week for Plant based protein.

This is another good sign for us because this shows that we are one step closer to achieving our client's goal. Students are looking forward to having Plant based food and understanding it as a healthier substitute for meat further implies that the sales of Plant based food will likely be positive, our client will be able to make profits with the implementation of more Plant based protein.

The results from the rest of our survey give us a better understanding of the challenges that are ahead of us currently. From the answers, we found that UTM currently has little publicity on the existing Plant based food and protein, many students are unaware that UTM has Plant based food options. Even though there are a lot of Plant based food options on campus like mentioned above, UTM is extremely lacking in a variety of options for protein alternatives.

Combining with the fact that the majority of the students take protein daily and are interested in having Plant based protein alternatives other than meat, we will say that our client has a very good chance to succeed.

Recommendations

Based on our findings and research, we are recommending to add more Plant Based Proteins (PBPs) to UTM's menu. We are also recommending that the UTM Hospitality and Retail Services promote and advertise PBP contents of the existing and future menus. We were also made aware by our contact, Andrea De Vito, in the UTM Hospitality and Retail Services Department, that the contract between the current food service provider Chartwells and UTM will be ending in September or around that time. Based on that, we are also recommending that the next contract be chosen with a food service provider that already has a menu with PBP options, or if the options aren't a part of that menu already, we are recommending some options with their nutritional values and facts about them to be able to build our own menu.

From looking at menus of York University, Humber College and Guelph University, we have come up with a few options to advertise and for students to be made aware of the options available and their nutritional values. From Guelph University, we found that their Hospitality and Services Department offers a very detailed Nutritional Analysis Breakdown of each food item from each food place on campus.

Lunch Items	Serving Size	Calories (kcal)	Total Fat (g)	Saturated Fat (g)	Trans Fat (g)	Cholesterol (mg)	Sodium (mg)	Carbohydrates (g)	Fibre (g)	Sugar (g)	Protein (g)
Aloo Gobi	190 g	118	1.6	0.3	0	0	166	23	4	4	5
Bean Burrito	440 g	535	18.3	9.4	0	42	1321	69	12	13	23
Bean Taco	200 g	200	16.6	4	0	0	550	46	6	3	9
Beef Pot Pie	190 g	480	30.2	6.1	0	35	226	36	3	5	17
Beef Burrito	530 g	840	32	13	1	90	850	93	15	13	50
Beef Taco	230 g	589	37.6	12.5	0	86	362	34	2	3	27
Black Bean Burger on Kaiser	205 g	315	6	1	0	0	432	57	5	6	10
Butter Chicken	195 g	361	19.5	4.2	0	29	724	30	6	5	17
Caesar Chicken Salad	492 g	729	35.3	9.9	0	129	1473	53	6	8	50
Channa Masala	205 g	231	3.85	0.26	0	0	644	36	6	16	6
Chicken Club	265 g	719	49.3	17.1	0	133	1096	30	3	4	40
Chicken Fajita	305 g	381	8.2	3	0	77	671	44	6	9	35
Chicken Pot Pie	200 g	436	24.6	3.4	0	28	698	36	3	5	18
Chicken Sandwich w/ SDT Mayo	225 g	397	11.4	2.8	0	97	486	35	2	5	40
Chicken Souvlaki	155 g	400	23.1	3.7	0	25	660	31	6	2	19
Chickpea Stew	230 g	165	3.4	0.1	0	0	419	30	5	9	5
Chickpea & Vegetable Roti	300 g	300	2.3	0.2	0	0	515	60	7	8	11
Fish & Chips (fish only)	290 g	460	15	1.5	0	90	1990	42	0	0	32
Fish Taco	490 g	583	9.3	1.3	0	38	332	100	9	26	28
Jerk Chicken breast	290 g	266	3.2	1.6	0	95	328	18	2	0	34
Pepperanta	150 g	65	2.3	0	0	0	216	10	3	7	2
Pulled Pork on Kaiser	325 g	560	19.8	5	0.1	120	1390	48	1	17	44

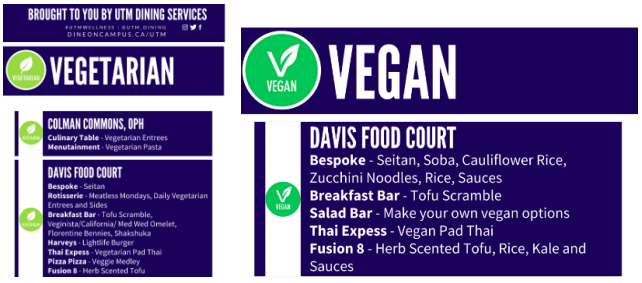
We are recommending something similar to be provided by the new food service provided and the UTM Hospitality and Retail Services. This information will give a better idea to students about the nutritional facts before they purchase their food items. We are suggesting to include serving sizes, calories per recommended serving, total fat (g), cholesterol (mg), sodium content (mg), carbohydrates (g), fibre (g), and most importantly protein (g). We have done some research into the best protein sources for vegetarians and vegans because they are all plant based and would fit our agenda. We found that, seitan, tofu, tempeh, edamame, chickpeas and quinoa provide the highest protein values in grams, as presented in this table below, and we are suggesting their addition to the UTM menus.

Plant Based Food Item (100g serving size)	Protein content (g)	Animal Food Item (100g serving size)	Protein content (g)
Tofu, Tempeh, Edamame	10-19 g	Chicken Breast	27g
Seitan	75g	Beef	26g
Chickpeas	19 g	Turkey	30g
Quinoa	4.4 g	Shrimp	23 g

Tofu, Tempeh and Edamame (protein content 10-19g per 100g serving) are very good sources of iron, calcium, vitamin K and fiber. They are also good sources of B vitamins and minerals like phosphorus and magnesium. Chickpeas (19g P per 100g) are also an excellent source of fiber, iron and complex carbohydrates as well as minerals like potassium. Seitan is also the main protein from wheat and it is a wheat gluten and is extremely rich in protein with an even much higher protein content than chicken or beef (75g per 100g serving vs 26,27 g per 100g serving) *(U.S Department of Agriculture, 2018)*. This shows that switching to a plant based protein alternative may just be as healthy and adequate for the

human body than eating meat options to get the protein. If the nutritional data is made available to UTM students, as per our recommendation, the students, faculty and other utm goers and food buyers can see and compare for themselves what is more beneficial from a nutritional perspective.

Lastly, we are also recommending that these new foods be made available at OPH and the Davis Food court specifically at Bespoke, the Salad and the Breakfast Bar. These would be the easiest locations to test them out in because OPH is the main location resident students go to eat and they can be easily surveyed again in follow ups to the new additions to the menu. Sales can also be more easily monitored and data can be more accessible if new menu items are tested out at OPH first. The Davis Food court is also a recommendation because Bespoke already offers some vegetarian and vegan plant based protein options, and if students already buy them from there, they will be more likely to see new options and want to try them. The Salad and Breakfast Bars are also go-tos for students already looking for plant based meals so they will also be more willing to try out the new options. Advertising is also a main recommendation to the UTM Hospitality and Retail Services department, as some options already do exist but students do not always know about them. From our surveys of 100 students, we have learned that there is a demand for more plant based options on campus but students do not know they are available and where to find them.



Conclusion

Plant based proteins gained a lot of momentum in the last couple years as a healthy substitute for meat protein. Given the importance of protein in our diet, it became very popular among the vegetarians and vegans as it provides them with more options to introduce protein in their diet. The University of Toronto, Mississauga campus comprises a diverse range of people from all parts of the world with different food habits, diets, restrictions etc. The Hospitality Department at the campus always tries to meet everyone's food need by making sure they provide a wide range of food options throughout the campus.

Our investigation through a survey conducted at the campus suggests that 70% of students are interested in having plant based protein and would like to see more plant based options on campus. 60% of the students think that plant based option is a healthier substitute for meat and are willing to skip meat once or twice in a week for plant based protein. Given the demand of the plant based protein option, we do recommend the Hospitality Department to introduce more plant based protein options at the campus. The options should not only include different varieties of plant proteins such as plant based proteins from quinoa, chickpeas, edamame, tofu etc. but should also be palatable for our customers so they can be drawn more towards it. We also would like to recommend the department to engage more in advertising the plant based protein option at the campus to secure more customers as more than half of the students who took the survey have never seen advertisements on plant based protein at the campus.

To achieve success in implementing plant based protein at the campus, our client should test it out in OPH (resident's hall) and Davis Food court as the traffic of students are more at these locations. Our recommendation is mostly based on the feedback we got from conducting the survey and we do suggest that our client should look into the York University, Humber

College and the University of Guelph's menu options and plant based protein sales report to drive their decision as these campuses already have a wide variety of plant based protein options.

References

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3. FoodData Central Search Results. (2018, April). Retrieved from https://fdc.nal.usda.gov/fdc-app.html#/food-details/168411/nutrients
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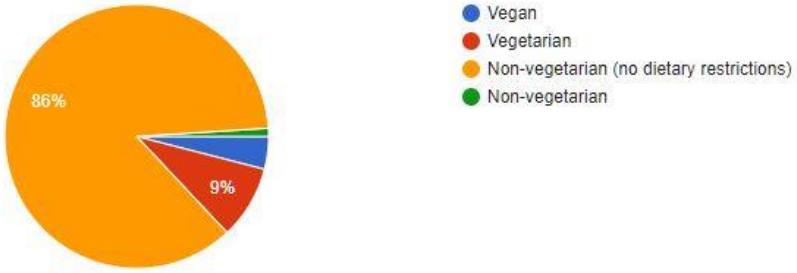
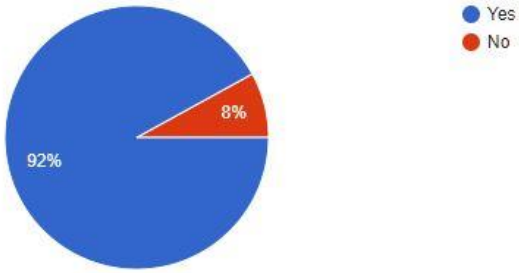
Appendices

Survey Questionnaire and Results

Do you identify as any of the following?

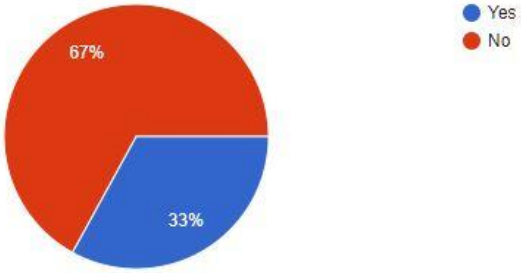


Do you have protein at least once a day?

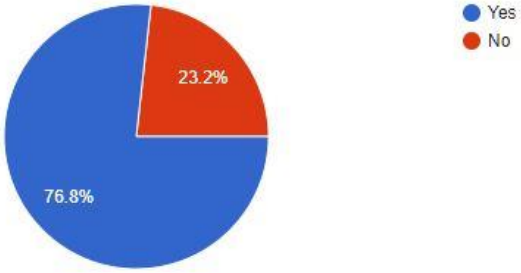


Would you consider skipping eating meat for 1 or 2 days of the week if other options were available?

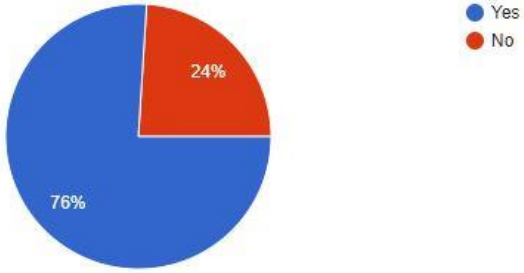
Have you ever tried Plant-Based Protein at UTM?



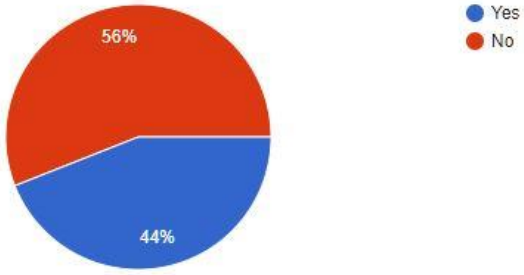
If you have or have never tried Plant Based Protein at UTM, would you be interested in trying it out?



Would you be interested in having more Plant Based Protein options at UTM



Have you seen Plant Based Meat options advertised on campus?



If offered, would you be interested in purchasing more Plant based Protein/Meat options than regular meat options?