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Plant-base Meat as Future Alternative: A Study of Malaysian Consumers Purchase Intention

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ABSTRACT

A large scales livestock production will lead to the greenhouse effect and gas emissions. Excessive greenhouse gas emissions and changes in climate are believed to be the main contributor to several serious global threats and global warming. However, recent fake halal meat cases in Malaysia had cause doubt among Malaysian consumers in purchasing meat products. As an option, plant-base meat may offer as a safer alternative for both meat and Halal demand. Plant-based meat is an alternative for conventional meat in terms of texture, taste, and appearance. Thus, this research intended to measure consumer purchase intention for plant-based meat products under the attribute of attitude, subjective norm, perceived behavioral control, product knowledge, and environmental concern. Total of 155 respondents participated in this survey and the questionnaire are widely distributed using the application of Google Form during Covid-19 Movement control Order (MCO). The correlation results portray consumer purchase intention on plant-based meat products is significant and correlated towards attitude, subjective norms, perceive behavioral control, product knowledge and environmental concern.

Contribution/Originality: This study investigates Malaysian consumers purchase intention towards plant-base meat using Theory of Planned Behavior's attributes; attitude, subjective norm and perceived behavioral control with addition element of product knowledge and environmental concern. The research setting portrays a great contribution in predicting changes in consumer purchase intention for new market niche.

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1. Introduction

Plant-based meat refers as a meat substitutes that were manufactured from alternative protein sources (Van der Spiegel et al., 2013). Soy-based ingredients like tofu and mycoproteins like tempeh are used as a meat replacement (Bonny et al., 2015). Majority of meat analogues are based on soy protein such as tofu, tempeh, and tofu skin due to their specific properties and economical price (Kyriakopoulou et al., 2019). The nutritional benefits offered by plant-based meat includes a high quality of protein and it reduced environmental impact on some categories. Plant-based meat able to fulfil consumers demand in terms of taste, texture, and appearance. It reduces wide range of global warming factors such as greenhouse gas emissions, deforestation and freshwater consumption (McMichael et al., 2007).

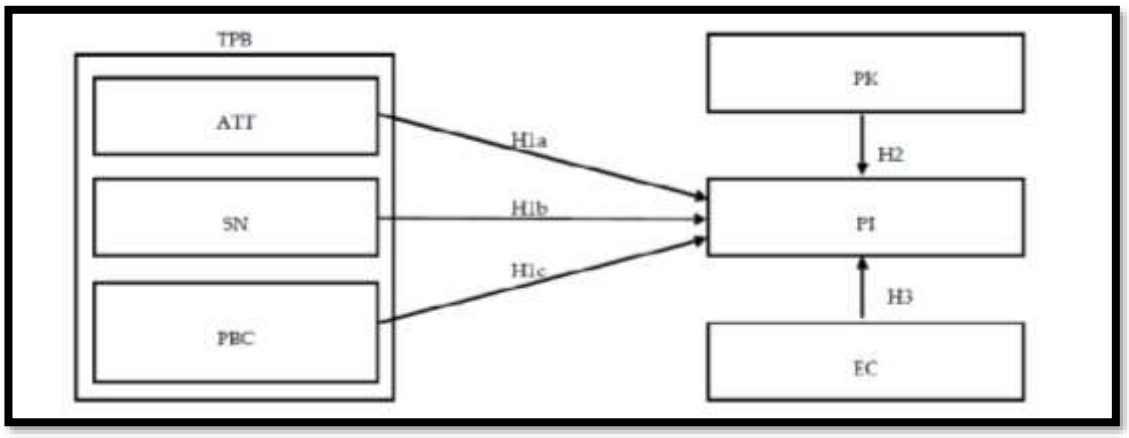
As years past, plant-based meat was introduced into the market due to greenhouse gas emission has become a concerning environmental issues that gained global attention. This is due to the livestock production that led to the primary source of greenhouse gas emissions. Excessive greenhouse gas emissions and climate change are believed to be the main factors that contributed to several serious global threats and resulted to global warming. These factors are believed to be the main contributors to global warming (Shen & Chen, 2020). Past research has found that health-conscious consumers and those consuming meat intake rates at the lowest rates tend to choose and purchase plant-based meat products for the sake of their health (Kopplin & Rausch, 2021). Due to the disease prevention and health concern, consumption of plant-based meat products was associated with the benefits of plant-based diet. Onwezen et al. (2021) affirmed that consumer acceptance towards plant-based meat products is driven by healthiness and its taste. Thus, consumers tend to choose plant-based meat products as a substitution to conventional meat.

Recently, cases of fake halal meat impose a huge impact on consumer sensitivity and trust in consuming meat. Malaysia fake Halal meat scandal is believed to be going on for more than 40 years before recent cases become a headline in local newspapers and stirred concern Muslim community (Arshad, 2021). As a push factor, such critical case will trigger consumer judgment in choosing other meat substitutes and divert to the plant-based meat products as safer option. Additionally, the emerging issues of the greenhouse effect and fake halal meat bring an opportunity for this study to explore. This study examine the purchase intention among consumers for plant-based meat products under the factors of attitude, subjective norm, perceived behavioral control, product knowledge and environmental concern.

Figure 1 emphasis on the Theory of Planned Behavior (TPB) consisting three attributes; Attitude (ATT), Subjective Norm (SN) and Perceived Behavioral Control (PBC). Element of Product Knowledge (PK) and Environmental Concern (EC) were included in the study to examine its effect on Purchase Intention (PI). This proposed research framework was adopted from Shen and Chen (2020).

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Figure 1: Theory of Planned Behavior (TPB)



Note: Attitude (ATT), Subjective Norm (SN) and Perceived Behavioral Control (PBC). Element of Product Knowledge (PK) and Environmental Concern (EC) were included in the study to examine its effect on Purchase Intention (PI)

Source: Shen and Chen (2020)

2. Literature Review

2.1. Purchase Intention

Mirabi et al. (2015) stated that price, product and service quality play an important role in purchase intention among consumers. De Boer et al. (2014) reported that only a minority of consumers regularly buy meat alternatives products and Hoek et al. (2011) reported that the majority of consumers do not prefer meat alternatives products even though previous study have found that consumers who are vegetarians and those who practice vegan diets lead to better animal welfare and environment condition (Bryant, 2019). Thus, Michel et al. (2021) indicates that consumer's positive reaction for meat alternatives is mostly from regular customers of meat alternative products.

Previous study from Hoek et al. (2011) found that consumers who like conventional meat are more likely prefer meat alternative that resembles and similar to conventional meat. In contrast, meat alternatives lovers are likely not preferred to have their meat alternatives to resembles conventional meat. In order to increase consumer's acceptance toward meat alternative products, it is suggested that meat alternative products have the greatest chance in substituting conventional meat if these products are made to mimic the taste and texture of meat and attractively priced for consumer to have purchase intention for it (Michel et al., 2021). Therefore, Polkinghorne et al. (2008) highlights that once a consumer has set their mind to purchase a certain product, then the most vital factor influencing repeat purchase intention among consumers is the variable of eating quality.

2.2. Theory of Planned Behaviour (TPB)

Theory of Planned Behaviour (TPB) consists of attitude, subjective norms, and perceived behavioral control that influence purchase intention whereby these behaviours can be directly predicted. According to the TPB, purchase intention is primarily determined by these three factors (Ajzen, 1991). Purchasing attitude refers to one's attitude toward

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engaging in the behaviour, subjective norm refers to the degree of social pressure perceived by the person regarding the behaviour, and perceived behavioral control refers to the level of control on how individuals perceive he or she has over conducted the behaviour. Attitude and subjective norm represent the perceived desirability of executing the action, while perceived behavioral control represents on perception whether the behaviour is personally manageable and vice versa (Chen, 2007). Purchase intention is frequently used to measure the occurrence of actual behaviour and marketers believed that purchase intention is the most precise forecaster that contribute to consumers' buying behaviour. This theory will be used as s grounded theory for consumer's purchase intention for meat alternative product specifically plant-based meat.

2.3. Attitude

Attitude generally composed of an individual's expectation about an object and their perception of the importance of the outcome generate by that particular behaviour of them (Ajzen, 1991). Latip et al. (2020) supported that attitude and behaviour is typically measured by individual judgement and evaluation which an outcome link to a specific behaviour. Consequently, a positive consumer attitude towards meat alternative product consumption poses a significant effect on the intention to consume of meat alternative products (Chen, 2022; Knaapila et al., 2022; Ruby, 2012). Chen (2022) indicates that consumer who are more concerned about their health and environmental condition tend to consumed plant based meat products compare to others. The qualitative studies conducted by Sanchez-Sabate et al. (2019) stated that consumers' awareness of environmental impact of meat consumption has change the consumers' willingness to eat less meat to reduce the negative impact on the environment. Meanwhile, Ruby (2012) argued that omnivores are more likely to have a very high positive attitudes for meat and they often associates meat with status, luxury, taste and healthy. However, Knaapila et al. (2022) reported a positive consumers' attitude towards meat alternative, still they did not consume that product regularly as it is too expensive and lack of knowledge in food preparation. Hence, it is essential to investigate attitude in the context of this study.

2.4. Subjective Norm

Funk et al. (2020) suggests that removing some of the peer pressure could contribute to increase perceived appropriateness of consuming meat alternative products like plant-based meat. Besides, role modelling could help in overcoming unwillingness in meat alternatives consumption for instance, when respected people from numerous backgrounds advertise and promotes meat alternative and when hosts serve a vegetarian dish with meat alternative to their guests. This indirectly led to high consumption of meat alternatives and purchase intention among consumers for plant-based meat products. On the other hand, if consumer believe that their close relatives' perception of organic foods is bad, then the purchase intention to purchase organic foods are low (Chen, 2007). This validates that subjective norm is significantly contributing to the purchase intention for organic foods (Scalco et al., 2017).

2.5. Perceived Behavioural Control

Perceived behavioural control also includes the understanding of self-ability, urgent-need perception, and convenience perception in influencing them to purchase intention

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(Chen, 2007). Higgs (2015) highlights that people reaction toward meat alternatives and whether they are approved is influenced by the social norms that define what is appropriate in certain situations. It means that individual's eating behaviour has an influence on what is considered appropriate or vice versa in a specific situation (Herman et al., 2003). In addition, it is likely that individuals who perceive more behaviour control tend to have high intention in purchasing and it shows that perceived behavioural control significantly influenced consumers' purchase intention towards organic foods (Chen, 2007). Thus, it shows that perceived behavioural control has significant impact on consumer's purchase intention for plant-based meat products.

2.6. Product Knowledge

Product knowledge refers as consumers' awareness of certain information about a particular product. The main source of product knowledge including consumer's past experience with the actual product and the main objective of advertisement is to target influencing consumer's decision in selecting and choosing a particular product. Product knowledge is a significant influence on purchase intention among consumers and it is measured through both subjective and objective knowledge whereby it is hard to be separated sometimes. In general, product knowledge is acquired through the experience by the consumer in using the focal product (Wang & Hazen, 2016). Previous studies indicates that prior knowledge impacts the processing of information and product knowledge become an indicator to determines whether consumers decide to purchase the product or not (Gomez et al., 2017). However, different levels of product knowledge may affect consumers in making different decisions.

A consumer with a higher product knowledge is more familiar with a particular product that they select are more likely to use intrinsic cues to judge the product attributes and the quality while consumers with a lower level of product knowledge are more likely to use extrinsic cues to make decisions of their choices. The previous study revealed that product knowledge has a significant positive impact on purchase intention (Shen & Chen, 2020). Hoek et al. (2011) explained that the consumption of meat alternative products is highly consumed by well-educated people. However, the unfamiliarity and lower sensory appeal of meat alternative is identified as the primary barriers to the low consumption of this product. Additionally, it shows that product knowledge has significant relationship with purchase intention for plant-based meat among consumers.

2.7. Environmental Concern

Concern for the environment is refer as consumer's affective evaluation toward environmental issues and it is usually conceptualized as a direct antecedent to environmental purchasing intention. Past studies explained that consumers are willing to purchase products and services only from companies with an environmentally friendly reputation. Newton et al. (2015) postulate that environmental concern does not directly influence consumers' purchase intention, but it helps consumer to acknowledge the environmental consequences that associated with the product that they have purchased. Previous studies found that individuals who are concerned or interested in particular issues are more likely will seek further information regarding those issues compared to individuals who are not interested. With the knowledge regarding environmental concern that certain consumers have, it may formulate the environmental purchase intention. However, Arısal and Atalar (2016) argue that environmental concern influence purchase intention among consumers. Concern

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toward environmental issues is one of the factors that influence the consumption of meat alternative products. This is because, consumers who endorse the value of caring for nature are more likely to prefer plant-based meat compared to consumers who do not (De Boer & Aiking, 2011).

3. Methodology

Quantitative analysis was used whereby the final results are discussed in the statistical evidence. Given that the relationship between cause and effect can be examined, this research can be categorized as a type of causal research (Sekaran & Bougie, 2016). This study's primary goal is to examine the variables that affected Malaysian consumers' purchase intention for plant-based meat products. Thus, the unit of analysis for this study is a person who consumed plant-based meat in Malaysia. Non-probability and purposive sampling were used whereby the respondents are selected based on purposive sampling with restriction that they were the main consumers for purchasing plant-based meat products. The overall sample size for this study was calculated using G-Power. This study makes use of this research tool since it is effective, widely applicable, and practical (Erdfelder et al., 1996). Total of 138 respondents were needed to effective analysis.

The instrumentation was adopted from Shen and Chen (2020). Self-administered questionnaires were employed in this investigation. The questionnaires employed a seven-point Likert scale to reduce ambiguity and confusion. Since this study was conducted during Covid-19 pandemic outbreak, the questionnaire was widely sent to Malaysian consumers utilizing online survey specifically Google Form application. The surveys were distributed to the respondents through social media platforms such as Whatsapp, Instagram, Facebook, and Twitter. The data gathered from the surveys was generated using the Statistical Package for the Social Sciences (SPSS).

4. Result

4.1. Result for Cronbach Alpha

Cronbach's alpha test is performed for both pilot test and actual data to determine the reliability of multiple-question for Likert scale surveys. A high alpha value indicates that the items for instrumentation are highly reliable. However, there is slim possibility that the items for the instrumentation are redundant. A low alpha value could indicate that the test does not have sufficient items or questions and less reliable. Therefore, adding more relevant items to the test could increase the alpha value. The low alpha value can also cause by poor inter-relatedness between the items of instrumentation, as might measuring several latent variables. Table 1 indicates the result of reliability test for actual data by using Cronbach Alpha.

Table 1: Result of Reliability Test for Actual Data by Using Cronbach Alpha

Variables	Cronbach's Alpha	Number of items
Purchase Intention (PI)	0.915	5
Attitude (ATT)	0.879	5
Product Knowledge (PK)	0.842	6
Environmental Concern (EC)	0.900	13
Subjective Norm (SN)	0.842	5
Perceived Behavioral Control (PBC)	0.922	5

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Total Items	39

Table 1 indicates that the reliability for all of the items for each variable are good and excellent. The variable of perceived behavioral control with 5 items shows the highest value of Cronbach alpha which is 0.922, followed by purchase intention for plant-based meat products which is 0.915 and environmental concern with 0.900 for its reliability value. The remaining three variable which is attitude, product knowledge and subjective norms shows that the reliability for these variables are good. The 5 items for attitude get 0.879 for its reliability value and followed by product knowledge and subjective norm with 0.842 for its reliability value. Additionally, this result indicates that the instrumentation that used for this study is valid and relevant to use and it can be distribute to the targeted respondents in Malaysia.

4.2. Respondent's Demographic Profile

A total of 155 respondents' data were analysed. Demographic data shows that the majority of respondents is female with a total number of 110 (71%) and followed by male with 45 (29%) respondents. It also shows that majority of respondents is from the age of 21 to 30 with 89 (57.4%) respondents and the minority are from the age of 61 and above with 2 (1.3%) respondents. As for the race profile, Malay respondents portray as majority who participated in this survey with 110 (71%) and Indian with 11 (7.1%) as lowest respondents. Muslim respondents who participated in this survey showed the highest percentage with a total of 117 (75.5%) while respondents who profess Buddhism showed the lowest percentage with a total of 8 (5.2%) respondents.

Education level shows most of the respondents are degree holders with 96 (61.9%) and the least is PhD holders with 5 (3.9%) respondents. Majority of the respondents are employed with 84 (54.8%) and followed by unemployed respondents who are 71 (45.2%) respondents. As for the state in Malaysia, high response rate were 60 (38.7%) respondents from Selangor, and the lowest respondents came from Perlis, Sabah and Terengganu with only 2 (1.3%) respondents.

4.3. Normality Test & Non-Parametric Test

The purpose of normality test is to determine whether sample data were taken from a population are a normally distribution or otherwise. An assessment of the normality of data is a prerequisite for most of the statistical tests as normal data is one of the basic assumptions in parametric testing. This study applied Shapiro-Wilk test as our numerical method in assessing normality. According to Mishra et al. (2019), it stated that the data is normal if the p-value (Shapiro-Wilk Test Sig.) is larger than 0.05 and the data is not normal and significant if the p-value is less than 0.05. The Shapiro-Wilk result indicates that all the p-values are less than 0.05. Therefore, we can conclude that the data is not normally distributed. Non-parametric test will be conducted to facilitate the non-normal data distribution.

Since the data showed that it is not normal, then non-parametric test was run. As an alternative to the parametric test, non-parametric test can be used to analysed the non-normal data. It includes Spearman's rho, Kruskal-Wallis test and Mann-Whitney test (Pallant, 2013).

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4.4. Spearman Correlation

Spearman correlation is used to explore the strength between the relationship of two continuous variables. It gives the indication for both indication either positive or negative as well as the strength of the relationship (Pallant, 2013). Since the data are not normally distribute, then Spearman correlation are conducted to measure the strength of relationship between two variables.

Table 2 indicates that the strength of correlation for perceived of behavioral control with 0.771. The remaining four variables namely attitude (0.686), product knowledge (0.675), subjective norm (0.595), and environmental concern (0.420) showed the strength of its correlation in the moderate categorization according to (Dancey & Reidy, 2007).

Table 2: Spearman Correlation Result

Correlations								
			PI	ATT	SN	PBC	PK	EC
Spearman's rho	PI	Correlation Coefficient	1.000	.686**	.595**	.771**	.675**	.420**
		Sig. (2-tailed)	.	.000	.000	.000	.000	.000
		N	155	155	155	155	155	155
	ATT	Correlation Coefficient	.686**	1.000	.675**	.659**	.679**	.439**
		Sig. (2-tailed)	.000	.	.000	.000	.000	.000
		N	155	155	155	155	155	155
	SN	Correlation Coefficient	.595**	.675**	1.000	.732**	.555**	.413**
		Sig. (2-tailed)	.000	.000	.	.000	.000	.000
		N	155	155	155	155	155	155
	PBC	Correlation Coefficient	.771**	.659**	.732**	1.000	.620**	.544**
		Sig. (2-tailed)	.000	.000	.000	.	.000	.000
		N	155	155	155	155	155	155
	PK	Correlation Coefficient	.675**	.679**	.555**	.620**	1.000	.539**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000
		N	155	155	155	155	155	155
	EC	Correlation Coefficient	.420**	.439**	.413**	.544**	.539**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.
		N	155	155	155	155	155	155

**. Correlation is significant at the 0.01 level (2-tailed).

5. Discussion

The purpose of this study is to examine the purchase intention for plant-based meat products among consumers in Malaysia. Overall analysis result indicate that all p-value

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are below than 0.05 and it directly shows that the result is significant. Perceive behavioural control with high correlation strength portray that eating plant-base meat product as a social norm does highly correlated and influence Malaysian consumer's behaviour. Under recent Malaysia Halal meat scandal, Malaysian consumers tend to consumed plant-based meat products as it is deep appropriate during that situation. Attitudes and product knowledge does affect the purchase intention since the sample selected for this study were the consumers of plant-based meat products and they know the value of this products and its benefit to health and environment. Subjective norm explained Malaysian consumer's intention to purchase plant-based meat products is largely influence by family members, peers and surrounding. Consumers from different races and religion such as Hinduism and Buddhism are high likely to purchase plant-based meat product as they have been brought up in a family that promote the consumption of vegetables diet. Environmental concerns have an impact on Malaysian consumer's intention to buy plant-based meat products as majority of the consumers are respondents with degree holder, they understood the positive environmental impact of choosing plant-based meat product to the global warming

6. Conclusion

In conclusion, the correlation result shows that all attributes examine in this study are significant to purchase intention for plant-based meat products. It gives an indication that the future and potential for plant-based meat products in Malaysia are wide and highly opportunistic. Malaysian regardless of races and religion does have the intention to purchase plant-based meat products. Additionally, Malaysian consumers have display effort in environmental concern as they understand their decision of purchasing plant-based meat products may have a direct impact to the environment and consequently global warming will affect them in the future. This study recommends that food industries and businesses to develop promotional activities that incorporate plant-based meat products in order to increase consumers' product experience and interest in the product and to reach to new potential consumers who yet to try plant-based meat product. The food industry could increase the market demand by creating a variety of plant-based items to entice people to buy plant-based meat products. Apart from that, it is also recommended for a marketing line to promote the benefits of plant-based meat that can be offered to the consumers and the environment in terms of improving one's health and environmental conditions.

Ethics Approval and Consent to Participate

The researchers used the research ethics provided by the Branch Ethics Research Committee of Universiti Teknologi MARA (BERC). All procedures performed in this study involving human participants were conducted in accordance to ICH Good Clinical. Practice Guidelines, Malaysian Good Clinical Practice Guidelines and the Declaration of Helsinki.

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Conflict of Interest

The authors reported no conflicts of interest for this work and declare that there is no potential conflict of interest with respect to the research, authorship, or publication of this article.

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