

Factors Influencing Willingness to Reduce Meat Consumption among Students in Universiti Putra Malaysia

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Abstract

Meat is one of the most consumed and nutritious foods, but excessive consumption is often associated with negative effects on the environment and human health. Based on the Theory of Reasoned Action (TRA), this study aims to understand the relationship between environmental attitude, health attitude, subjective norms and willingness to reduce meat consumption as well as the factors that influence willingness to reduce meat consumption. A total of 202 students of Universiti Putra Malaysia were involved in this study where they were selected using simple random sampling. Data were collected through a set of self-administered questionnaires. The results of the study show that environmental attitudes ($r=0.528$, $p < 0.001$), health attitudes ($r= 0.595$, $p < 0.001$) and subjective norm ($r= 0.455$, $p < 0.001$) have a significant relationship with willingness to reduce meat consumption. Regression results showed that all three determinant variables explain 41.2% of the variability of willingness to reduce meat consumption. Health attitude had the highest beta (β) value of 0.526 ($p < 0.001$) followed by environmental attitude and subjective norm with beta values of 0.200 ($p < 0.001$) and 0.086 ($p < 0.001$), respectively. Therefore, to reduce meat consumption, it is important to use target intervention and communication messages as well as celebrities' endorsement and social influence.

Keywords: Theory of Reasoned Action, Multiple Regression, Meat-Free, Vegan, Plant-Based Diet

Introduction

Meat is one of the most widely consumed and nutritious foods. The global demand for meat and other animal products has been increasing in most countries due to rising incomes, increased populations, and other sociocultural variables (Dagevos & Voordouw, 2013). Recent studies found that meat consumption has increased by up to 500% between 1992 and

2016 (Katare et al., 2020). By 2050, the world population of 9.7 billion presented a huge market of people that need to be fed (Erhardt & Olsen, 2021).

Meat production is extremely resource-intensive in terms of land use and freshwater withdrawals, resulting in environmental issues such as terrestrial acidification and eutrophication (Hartmann et al., 2021). Pollution from the use of fossil fuels, as well as water and land consumption, are some of the environmental effects associated with meat production. It is found that 83% of agricultural land expansion in the tropics occurred at the expense of forests (Gibbs et al., 2010). As a result, biodiversity is being damaged and lost to a significant amount, with deforestation for animal feed accounting for 70% of global deforestation (Stoll-Kleemann & Schmidt, 2017). In addition, livestock contributes 80 percent of all agricultural non-CO₂ emissions, accounting for about 12 percent of all anthropogenic greenhouse gas (GHG) emissions (Havlik et al., 2014). While meat is high in proteins, vitamins, and minerals, it comes with a slew of health hazards. Reason being, the average protein consumption of approximately 68 grams per person per day in many high-income countries is more than one-third higher than the average daily adult requirement (Searchinger et al., 2019). Such excessive consumption behaviour raises the risk of heart disease, cancer, kidney and liver disorders as well as other chronic diseases due to its high fat content (Moreira et al., 2022; Rust et al., 2020). With growing concerns about unhealthy dietary patterns and food system sustainability, there are calls for a diet change and to reduce meat intake (Schiermeier, 2019; Szczybyło et al., 2022).

Reduced meat consumption may assist to conserve the environment, and decreased intake of red and processed meat has been associated to a lower risk of a variety of chronic diseases (Bianchi et al., 2022). Previous research has found that among the benefits of a low meat or meat-free diet cited by younger participants are environmental improvement, animal welfare, and improved overall health (Kemper, 2020). According to de Boer et al (2017), young adult (18-35 years old) low and medium meat eaters saw health as a reason to eat meat but also as a motivation to moderate/reduce meat consumption. Despite the benefits mentioned, Stubbs et al (2018) lamented that it is a challenge for consumers to change their meat consumption because most food choices are the result of ingrained habits that are difficult to break. Statista (2023) revealed that Malaysians consumed an estimated 50 kilograms of poultry meat per person per year. This puts Malaysia amongst the top global consumers of poultry meat worldwide. While poultry meat produced less greenhouse gas emissions compared to cattle, they still produced the second highest amount of emissions per kilocalorie out of a range of agricultural products. While vegetarianism and veganism are increasing in popularity globally, an overwhelming high percentage of Malaysian are unwilling to adopt the less-meat and meat-free trend. Thus, the purpose of this study is to contribute by examining the influence of environmental and health attitudes as well as subjective norm toward willingness to reduce meat consumption among students in Universiti Putra Malaysia, Serdang campus.

Literature Review and Hypotheses Development

Theoretical Approach

Environmentally friendly behaviour has received vast attention as it enables a more in-depth understanding about the consequences of human behaviour on the sustainability of ecological environments. One major trend of environmental research for the past two decades is the utilisation of well-established social-psychological theories for analysing and predicting environmental behaviour (Bamberg & Schmidt, 2003). One of the commonly used

psychological action theories is the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975)

The TRA postulates that individuals normally behave in a sensible and guided manner where they make systematic use of available information and implicitly or explicitly consider the consequences of their actions (Ajzen, 1985). Due to this, TRA is also considered to be deliberate processing models (Conner & Armitage, 1998). Many a time, individuals can easily perform and control their behaviours for activities such as donating blood, watching movies, attending lectures and so on. Hence, the TRA is mainly concerned with predicting volitional behaviours or behaviours that an individual has a good deal of control and understanding their antecedents (Ajzen, 1985).

The TRA assumes that the most proximal predictor of volitional behaviour is the intention to perform or not to perform that behaviour. Behavioural intention refers to an individual's motivation and readiness to perform a behaviour, which encompasses both direction (e.g. perform or not to perform) and intensity (e.g. how hard a person is willing to try and how much time or effort he or she is prepared to exert) (Ajzen, 1985, 1991; Sheeran, 2002). In general, the stronger the intention to carry out the intended behaviour, the more likely a person would do so (Ajzen, 1991).

In turn, an individual's intention is determined by two basic factors namely a personal or individual influence and a normative or social influence (Hale et al., 2002). The personal influence on intention is the attitude towards the behaviour, which represents the overall favourable or unfavourable appraisal of performing the behaviour (affective). According to Fishbein & Ajzen (2010), beliefs play a central role in the TRA as they reflect the foundations for the predictors of intention. As such, in accordance with an expectancy-value formulation, the attitude component in the model is a function of belief held about the target behaviour that is the possible outcomes of performing the behaviour weighted by the evaluation of these outcomes. Hence, a person who believes that performing a target behaviour will produce mostly positive outcomes will have a favourable attitude toward performing the behaviour and vice versa (Ajzen, 1985).

On the other hand, the normative influence refers to a person's subjective norm and is based on his or her belief about whether significant others (individuals or groups) would approve or disapprove of enacting the target behaviour (perceptions of social pressure). The strength of each normative belief is then weighted by the person's motivation to comply with each referent. Motivation to comply with the perceived expectations of others can be in the form of real or imagined pressures one feels for his or her behaviour (Hale et al., 2002). If a person believes that most significant others with whom he or she is motivated to comply think he or she should the behaviour will perceive social pressure to do so and vice versa (Ajzen, 1985). The relative importance of the personal and normative components in determining intention tends to vary according to the situation, behaviour and individual differences (Ajzen & Fishbein, 1980). Figure 1 illustrates the full model of the TRA.

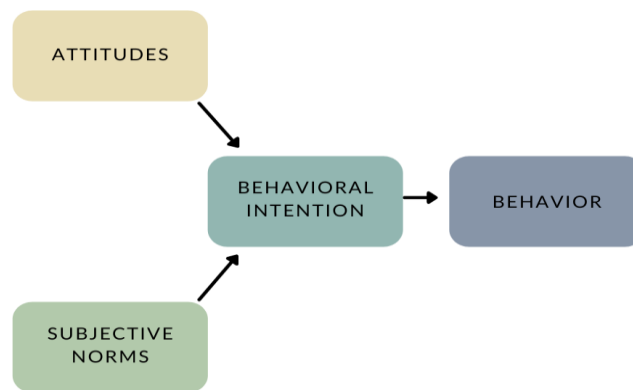


Figure 1 Theory of Reasoned Action

Willingness to Reduce Meat Consumption

Behavioural willingness indicates an individual's openness to opportunity, specifically an individual's willingness to perform a certain behavior in situations that are conducive to that behavior (Pomery et al., 2009). Ajzen & Fishbein (2005); Fishbein (2008) consider behavioural willingness as an alternate form of behavioural intention and these constructs tend to highly correlated. Behavioural intention refers to an individual's motivation and readiness to perform a behaviour, which encompasses both direction (e.g. perform or not to perform) and intensity (e.g. how hard a person is willing to try and how much effort he or she is prepare to exert) (Ajzen, 1985, 1991; Armitage and Conner, 2001; Sheeran, 2002). Although there is no perfect relationship between behavioural intention and actual behaviour, intention can be used as a proxy measure of behaviour (Pereira et al., 2020).

Research shows that consumers' purchase and consumption decisions related to meat and food products are influenced by a complex and interrelated set of physical, physiological, psychological, social, economic and cultural factors (Font-i-Furnols & Guerrero, 2014; Grunert, 2006; Grunert et al., 2004; Nestle et al., 1998). Making ecological food choices is challenging as changing behaviour in the domain of health behaviour and ecological consumption often requires consumers to overcome barriers, such as changing preferences, habits and lifestyle. During the transition from unwillingness to act to performing the desired behavior, people might be motivated by different benefits associated with the new behavior. Knowing which motives encourage consumers to adopt ecological food consumption patterns could be useful for future strategies promoting these behaviors. The literature shows that ethical concerns related to farm animal welfare and environmental impact are commonly reported drivers of meat avoidance, while reductions in meat consumption are more commonly motivated by egoistic/private factors such as price and health concerns (Malek et al., 2018; Neff et al., 2018). For this reason, in this study we aimed to investigate which factor affects consumers' willingness to adopt ecological food consumption behaviors, that is reduction of meat consumption.

Environmental and Health Attitudes

Attitudes are general thoughts and feelings about something or someone. They can be both positive and negative (Ricards & Schimidt, 2003). According to Montano and Kasprzyk (2008), attitude is determined by the individual's beliefs about the outcomes or characteristics of performing the behaviour (behaviour beliefs), which are weighted by

evaluations of those outcomes or attributes. Thus, a person with strong beliefs that performing the behaviour will result in positively valued outcomes will have a positive attitude toward the behaviour.

Environmental attitude has been defined as the ability to evaluate the state of the environment with a certain level of agreement (favour) or disagreement (disfavour) (Milfont & Duckitt, 2010). Environmental attitude is recognised as a predictor of pro-environmental behaviour (Chan & Lau, 2001). Zelezny et al (2000) stated that environmental attitudes are people's perceptions of themselves as part of the environment. Consumers are becoming more aware of the long-term effects of consumption on the natural environment and human welfare (Kostadinova, 2016). According to research by Godfray et al (2018), the production of meat produces more GHG emissions per kcal than the production of plant-based foods. The increased demand for meat has had significant environmental consequences (Poore & Nemecek, 2018). Meat production has a high environmental impact and contributes to climate change (Hedenus et al., 2014) and therefore those who are concerned about this would have tendency to reduce meat consumption.

Besides environmental beliefs, health reasons seem to play an increasingly important role to hold a vegetarian lifestyle nowadays (Barr and Chapman, 2002). Health is a result, a state of being that society greatly values and prioritises. It is also a 'resource for living,' as it enables people to operate and participate in the wide range of activities that define any civilization (McCartney et al., 2019). According to Farvid et al (2017), reduced meat consumption is an indicator of a healthy lifestyle in Western countries, but in developing countries, it is an indicator of poverty and is associated with risk factors for poor health. According to Albenny (2020), some participants stated that eating less meat was excellent for their health and that a diet high in meat can be hazardous to health. It is recently concluded that epidemiological evidence was strong enough to confirm that eating red meat or processed meat increased the risk of cancer, particularly colorectal cancer (Domingo & Nadal, 2017). Furthermore, red meat consumption should be limited to less than 50 g per day to avoid an increased risk of prostate cancer, breast cancer, or colorectal cancer (Domingo & Nadal, 2016). Aside from cancer risk, other studies have focused on the role of meat consumption in the development of other diseases, such as metabolic diseases, which can also be exacerbated by red meat consumption (Tantamango-Bartley et al., 2013). In the similar vein, meat consumption reduction intention was determined by health beliefs (Zur & Klockner, 2014). Based on the discussions, the following hypotheses are derived:

H1. There is a significant relationship between environmental attitude and willingness to reduce meat consumption.

H2: There is a significant relationship between health attitude and willingness to reduce meat consumption.

Subjective Norms

Subjective norms are the belief that a significant person or group of people will approve and support a specific behaviour. Subjective norms are determined by an individual's perceived social pressure from others to behave in a certain way, as well as their motivation to conform to those people's views. In addition, subjective norms can be measured and analysed in terms of expectations set by groups of important people (such as family, relatives, and friends) about whether an individual should or should not engage in a behaviour (Ham et al., 2015).

Subjective norms reflect a person's perception of social pressures to perform or refrain from performing a behaviour (Ajzen, 1991). A person may be concerned not only with what other people think, but also with how other people behave. As a result, other people's opinions and actions provide information that people can use to decide how to behave themselves (Rivis & Sheeran, 2003). A considerable amount of literature has been published on the effect of subjective norm on behavioural intention but the results were mixed. Subjective norm was found to be the strongest predictor of intention to reduce red and process meat consumption (Carfora et al., 2020) and a positive contributor in consumer intention to reduce meat consumption (Cheah et al., 2020; Chen, 2022; Krispenz & Bertrams, 2020; Seffem & Dohle, 2023). Similarly, it is also found to be significantly linked to consumer's willingness to adopt a more plant-based diet (Wang & Scrimgeour, 2021). Nonetheless, in other studies subjective norm has failed to predict intention to purchase organic food (e.g., Yadav et al., 2016) and red meat consumption (Graça, Calheiros, & Oliveira, 2015; Zur & Klöckner, 2014). In line with past literature, we postulate that

H3: There is a significant relationship between subjective norms and willingness to reduce meat consumption.

In the context of this study, we also conjecture that all three determinant factors influence willingness to reduce meat consumption among students in UPM, as per the following hypothesis.

H4: Environmental attitude, health attitude and subjective norm significantly predict willingness to reduce meat consumption.

Method

Instrument and Measurement

The items for the variables used in this study were adopted from several previous studies. Each item was being measured on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree). There are five sections in the questionnaire where Part A consists of demographic information of the respondents. The details collected are gender, age, races, year of study, level of education and frequency of meat consumption. Part B and Part C consist of five questions each measuring environmental attitudes and health attitudes, respectively. All items are adopted from (Albenny, 2020). Part D consists of four items measuring subjective norm adopted from Zahra (2021) while Part E consists of four items measuring consumer willingness to reduce meat consumption adopted from (Mattsson, 2021).

All scales exhibited good and acceptable Cronbach's alpha coefficient between 0.713 and 0.962 for pilot study and between 0.830 to 0.967 for actual study. The reliability coefficients for all variables are shown in Table 1 below. Descriptive, Pearson correlation and multiple regression analyses were used to analyse the data and to answer research hypotheses.

Table 1

Cronbach's Alpha for Pilot and Actual Study

Variables	No. of Items	Cronbach's Alpha Values	
		Pilot (n= 30)	Actual (n= 202)
Environmental attitudes	5	0.776	0.915
Health attitudes	5	0.713	0.830
Subjective norm	4	0.975	0.953
Willingness to reduce meat consumption	4	0.962	0.967

Data Collection Procedures

This study took a quantitative approach to testing hypotheses and determining the relationship between the variables. This study was conducted at University Putra Malaysia. According to the Official Portal of UPM, there are 17 residential colleges with distinction number of residences. Blank paper numbered from one to seventeen were put into the sample jar. Three residential college samplings were randomly selected namely Chancellor's College, 12th College and 14th College. For each of the residential college, one male block and one female block were selected through random sampling.

In this study, Yamane (1967) formula is used to determine the sample size for the population (see Figure 2). Considering the total number of populations known, Yamane's formula is used to calculate the sample size that can accurately representing the total of 16,000 students who are staying on campus. For the calculation, a confidence level of 95% and $e = .07$ are assumed. As a result, 202 respondents were required to complete the questionnaire (see Figure 3). Prior to distributing the questionnaire, it was piloted by 30 respondents. The main purpose of this process is to develop quality questions and to avoid ambiguity when answering them. The questionnaire took approximately 10 minutes to complete and is available in two languages, namely Malay and English. Respondents were selected using intercept method where researcher asked those who entered the residential college if they would be willing to participate in the study. Those who agreed were asked to fill in the questionnaire. There were no incentives given and respondents were assured that their personal information would be kept strictly confidential.

$$n = \frac{N}{1 + N(e)^2}$$

Figure 2 Yamane's Formula (1967)

$$\begin{aligned}
 n &= \frac{16\,000}{1 + 16\,000(0.07)^2} \\
 n &= \frac{16\,600}{79.4} \\
 n &= 202
 \end{aligned}$$

Figure 3 Calculation of study sample size

Results

Table 2 showed the demographic background of the respondents. There are 7 questions provided in this section which are gender, age, year of study, college, and frequency of meat consumption.

Table 2

Respondents' Demographic Characteristics

Variables	Frequency (<i>n</i> = 202)	Percentage (%)
Gender		
Male	74	36.6
Female	128	63.4
Age (Years old)		
19-22	84	41.6
23-26	115	56.9
26 and above	3	1.5
Race		
Malay	123	60.9
Chinese	53	26.2
Indian	19	9.4
Others	7	3.5
Year of Study		
Year 1	12	5.9
Year 2	37	18.3
Year 3	35	17.3
Year 4	118	58.4
College Chancellor's		
College	47	23.3
12 th College	39	19.3
14 th College	116	57.4

Frequency of meat consumption

2-3 times per week	121	59.9
Once per week	39	19.3
2-3 times per month	18	8.9
Once per month	12	5.9
Never	12	5.9

From 202 respondents, 63.4% are female whereas the remaining 36.6% are male. The range of age is between 19 to 26 years old and above. Majority of the respondents are within 23-26 years old which is about 56.9%, followed by 19 to 22 years old which is 41.6% and the least is 26 years old and above which is only 1.5%. For the races, 60.9% of the respondents are Malay, 26.2% are Chinese, 9.4% are Indian and only 3.5% or about 7 respondents are from other races. Majority of the respondents are in their Year 4 of study which is 58.4% and the least is from Year 1 which is 5.9%. Besides, the highest percentage which is 57.4% was from 14th College students and the lowest is from 12th College which is 19.3%.

The frequency of the respondents eating meat showed that 59.9% of them are taking meat for 2-3 times per week. There are 19.3% of the respondents which taking meat for once per week, 8.9% for 2-3 times per month as well as 5.9% are taking meat for once per month and never. Besides, majority of the respondents included red meat products in their diet which is 64.4% with merely 1% of the respondents were avoiding meat products.

Table 3 shows the means, standard deviations and Pearson's correlation of all variables. Willingness to reduce meat consumption was significantly correlated with all three determinants ($r_s = 0.45-0.60$, $p_s < 0.001$). This findings supported H1, H2 and H3 where environmental attitude, health attitude and subjective norm are positively correlated with willingness to reduce meat consumption. In addition, all determinant variables are positively intercorrelated with coefficient between 0.55 and 0.57 ($p < 0.001$).

Table 3

Correlation matrix, mean and standard deviation

Variable	M	SD	1	2	3	4
1. Willingness to reduce meat consumption			-			
2. Environmental attitude			0.53	-		
3. Health attitude			0.60	0.57	-	
4. Subjective norm			0.45	0.57	0.55	-

Note: All correlations significant at $p < 0.001$ (2-tailed)

Table 5 shows the regression results for this study. The R square of this study was 0.412, which means all three determinant variables explain 41.2% of the variability of willingness to reduce meat consumption. Based on the rule of thumb by Neill (2016), the regression model moderately fits the observed data values (See Table 4). The value F in this study was 46.247 with significant $p < 0.001$, indicating the independent variables in this study significantly predict the dependent variable.

Among the three determinant variables, health attitude had the highest value of standardized coefficients beta (β) of 0.526 among the three independent variables. This means that for every 1 unit increase in health attitude, the willingness to reduce meat consumption among the respondents will increase by 0.526 units. Thus, health attitude posed the most dominant influence toward willingness to reduce meat consumption. The next significant predictor is environmental attitude with a β value of 0.200 ($p < 0.001$) followed by subjective norm with a β value of 0.086 ($p < 0.001$). This indicated that H4 is supported.

The multiple linear regression equation is presented as below

$$\text{Willingness} = 0.511 + 0.200 \text{ EA} + 0.526 \text{ HA} + 0.086 \text{ SN}$$

The intercept showed above is 0.511 and given that all other variables are constant, for every single additional unit in environmental attitude (EA), health attitude (HA) and subjective norm (SN) will result in willingness to reduce meat consumption by an average of 20.0%, 52.6% and 8.6%, respectively.

Table 4

Rule of Thumb for Interpretation of R²

R ² values	Interpretation
.00	No linear relationship
.10	Small
.25	Moderate
.50	Strong
1.00	Perfect linear relationship

Source: Neill, 2016

Table 5

Multiple Linear Regression

Variables	Unstandardized (B)	Standardized Coefficients Beta (β)	Beta (t)	p-value
(Constant)	0.511		0.359	0.00
Environmental attitudes	0.200	0.243	3.397	0.00
Health attitudes	0.526	0.404	5.741	0.00
Subjective norm	0.086	0.095	1.361	0.00

Note: Dependent variable = willingness to reduce meat consumption, R Square=.412, F=46.247

Discussion

This paper aims to identify the factors that influence willingness to reduce meat consumption among students in UPM. Survey findings have shown that, among the three determinants, health attitude had the strongest effect on students' willingness to reduce meat consumption. Environmental attitude was another significant predictor of willingness to reduce meat consumption, followed by subjective norm. From the data collected on frequency of eating meat, most of them are includes meat in their diets. However, they are still aware that

consuming meat in excess could have negative impact on the environment and health. The TRA model proves to be robust and to have a strong predictive power in this study. In student population, both environmental and health attitude as well as subjective norm accounted for a large proportion of the variance in willingness to reduce meat consumption. This indicated that intention to reduce meat consumption depends on attitude and subjective norm, which is the main idea of TRA.

Environmental attitudes reflect behaviour that improves or degrades environmental quality, which is related to preservation and utilisation dimensions (Gifford & Sussman, 2012) while health attitude is associated with being health-conscious, motivated to engage in healthy behaviour, satisfied with, and loyal to healthcare services (Faber et al., 2021). Since both environmental and health attitudes were significant factors in reducing willingness to consume meat, quest to modify consumers' behaviour should be focused on creating communication content that emphasizes impact towards the environment and health, especially the latter. A possible content would be the use of prefactual message, that is the "If...then" speculation about an action-outcome connection that may or may not take place in the future. By proposing hypothetical future outcome related to meat consumption, such as "If you cut down on meat consumption, you help to reduce greenhouse gas emission or you will reduce the risk of bowel cancer". Such message is a form of mental stimulation that help individuals to determine whether and how a goal may be achieved. Recent literature has proved that this prefactual proposition to be effective in changing behaviour relating to meat consumption (Bertolotti et al., 2016; Carfora et al., 2020; Catellani et al., 2022). In addition, actual images of negative effects on environment and health could be included in advertisement, magazines and other publications.

While the effect of subjective norm is small compared to the other two predictors, it could play an important role in motivating individuals to reduce meat consumption. The small effect of subjective norm on willingness to reduce meat consumption could be because current sample consists of higher number of female respondents. Graca et al (2019); Van Den Berg et al (2022) revealed that female has a lower meat consumption than male and are more willing to try out vegetarian dishes. As in other consumer products, celebrities' endorsements or opinion leaders could be used as a form of social influence as well as communication tool to promote the idea of plant-based diet. Phua et al (2020) found that celebrities endorsing veganism may have social effect on consumer's attitude toward veganism and intention to become vegan while Calvo-Porrall et al (2021) revealed that celebrities' recommendations have effect on consumers' food purchase intention and willingness to pay for food. Intervention using celebrities or other role models has shown to successfully raised awareness for issues relating to animal welfare, veganism and meat consumption (Garnett, et al., 2015; Phua, et al., 2020). Consistent with this, campaigns could portray messages that eating less meat is a global trend and an altruistic value. This could motivate a desire to adhere to social standards and induce thought as to why more and more people reduce or ditch meat consumption. In addition, content promoting plant-based diet that provide all necessary nutritional needs to human body could also be implemented.

Conclusion and Future Directions

The purpose of this study was to investigate the factors that influence willingness to reduce meat consumption among UPM students. Using TRA model, this study contributes to a greater understanding of the attitude and subjective norm factors in predicting willingness to

reduce meat consumption. Demographic profile showed that majority of the respondents are female (63.4%), aged between 23-26 years old (56.9%), Malays (60.9%), in their Year 4 of study (58.4%) and from 14th College (57.4%). Meat consumption habit survey found that majority are taking meat for 2-3 times per week (59.9%) and included red meat products in their diet (64.4%). Based on Pearson's correlations, it is found that environmental attitude, health attitude and subjective norm were positively related with willingness to reduce meat consumption. In addition, the result from multiple linear regression shown that health attitude was the most significant factor that influence willingness to reduce meat consumption among UPM students, followed by health attitude and subjective norm. In order to encourage the uptake of less meat diet, marketing communication in the form of prefactual messages could be implemented. This method has proved to be successful in changing behaviour related to meat consumption as it motivates individuals to understand how and whether a particular goal is achievable. This could be strengthened through the adoption of celebrities' endorsements to encourage the reduction of meat consumption as well as plant-based diet. In addition, altruistic value could also be emphasized and associated with food choice.

Future study in understanding meat consumption behaviour could be extended by segmenting the student population with the purpose to identify the current stages of behavioural change. This is important as young adults play a pioneering role in developing more sustainable consumption patterns in the future. Another way to understand behavioural changes is through longitudinal study where the transition from intention to behavior of these young adults could be dissected (Hielkema & Lund, 2021). In addition, it necessary to study different population segments in order to design personalized strategies and interventions for behavioural change (Arnoudova, et al., 2022). Another recommendation that can be improved this study is considering other factors such as nutrition, economic and hedonic since willingness to change eating behaviour is a very complex issue that is influenced by multi factors, it is necessary to consider other factors that affect behavioural tendencies such as health-related values, taste reason, food literacy, food safety, human ethics and animal welfare (Cheah et al., 2020; Valli et al., 2019).

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