

## **Assessing Consumers' Behavior Towards Food Waste in Pahang, Malaysia**

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### **ABSTRACT**

*Food waste refers to food spoilage and losses that happen in the process of food supply chain. The occurrence of waste could happen intentionally or accidentally, and towards the end, it can impact others. In this situation, consumer behaviour plays an important role in food waste management. By identifying types of behaviour that influence food waste behaviour to improve consumer behaviour, it can lead to success in waste management. This research used the quantitative approach to measure consumers behaviour in Kuantan and self-administered surveys were used to collect data. The survey was distributed in Kuantan's main areas such as shopping malls, tourist attractions and higher educational institutions. Online platforms were also used to collect data via Google Form on Facebook, Instagram and WhatsApp. Data analysis was conducted to solve the research objectives, questions, and to examine the hypotheses. The data was analysed by using SPSS (version 20). All the questionnaires were returned and the data was then successfully collected and gathered. In total, 98 respondents responded via Google form and 302 respondents responded via hard copy in Kuantan. Based on the result, it shows that the subjective norm and attitude are not predictors of consumer food waste behaviour whereas perceived behavioural control displays a significant relationship with the dependent variables. Additionally, this study is limited to research that is dependent on self-reported data in Kuantan only. Further research on actual food waste by consumers, and how to prevent and reduce food waste in Malaysia is necessary to minimize waste that is sent to landfills. Hence, this study concludes that food waste is a major problem in Malaysia that ends up in landfills as food is not recycled properly.*

**Keywords:** *Attitude, Food Waste, Perceived Behavioural Control, Subjective Norm, Theory of Planned Behaviour (TPB)*

### **INTRODUCTION**

Notably, diet and nutrition are important in maintaining one's well-being and preventing ailments (Turconi et al., 2008). Consumers are responsible for their very own dietary patterns, well-being and practices (Bargiota et al., 2013). Not only that, but attitude is also essential in the reception and support of well-being, and for wholesome propensities (Platania, Rapisarda & Rizzo, 2016). According to Zugravu (2012) that freedom is often perceived as something that is attained by changing eating patterns and diet. However, bad eating habits can lead to food wastage (Loke & Leung, 2015). Food waste can

be referred to as food spoilage and losses (Martin-Rios et al., 2018). According to Lanfranchi et al., (2016), food spoilage happens when food is already spoiled before being cooked or produced while food losses happen when food quantity and quality are reduced when it is cooked or produced and results in unsuitable food for consumption. Food waste is also being recognized globally such as in the United States (Garrone, Melacini & Perego, 2014). Food waste is estimated at a value of 165.6 billion dollars annually or 188 kg per capita; and in North America and Europe, food waste is estimated at almost 300 kg per capita annually (Martin-Rios et al., 2018). FAO (2015) regulated that North America and Oceania had the highest percentage of food being wasted, followed by Europe and industrialized countries in Asia. Furthermore, food wastage is a problem that has an effect on sustainable development such as in economic, environmental and social areas (Sigurðardóttir, 2017).

## **PROBLEM STATEMENT**

According to Naidu (2017), in Malaysia, the Solid Waste Corporation (SWCorp) which deals with food waste, stated that Malaysians produce almost 38,000 tonnes of waste per day and around 15,000 tonnes belong to food waste. The Deputy CEO from SWCorp, Mohd Pauze Mohamed Taha, said that approximately 8,000 tonnes, which is the equivalent of almost 60% of the waste produced are unnecessary food waste (Naidu, 2017). It is estimated that Malaysians wasted 3,000 tonnes of food per year in a family of five and that one in five people starved daily in Malaysia (Bong et al., 2017). Last year, 16,000 tonnes of food was wasted every day which could have fed around 12 million people three meals a day (Pillay, 2018). That is the reason why 30% of the 3,000 tonnes of food waste ends up in landfills before it reaches consumers (Jaaffar, 2017). Therefore, it is important to educate consumers to minimize waste through waste separation. By managing their food waste, it is also essential to identify the important determinants in improving and sustaining their behaviour (Martin-Rios et al., 2018). By recognizing the important determinants of consumer behaviour, the government can construct comprehensive strategies and develop new programmes that can change consumers behaviour. Consequently, it could help the government achieve its objective of minimizing food waste in Malaysia (Ayob et al., 2016). The theory of planned behaviour (TPB) is commonly used to determine consumer food waste behaviour. It is comprised of subjective norms, attitudes and perceived behavioural control.

## **LITERATURE REVIEW**

### **Food Waste**

Food wastage can happen during a food supply chain process (Kadir et al., 2016). This food wastage can intentionally or unintentionally occur from the beginning of the production until the food reaches the consumer (Dung Thi et al., 2015). Similarly, the Food and Agriculture Organization FAO, (2015), stated that this waste can happen during cropping, packing, storing, delivering and retailing. However, if the food is spoiled before getting to the consumer, it is described as food loss (Kadir et al., 2016). According to Martin-Rios et al. (2018), some foods are mismanaged and spoiled through the food chain and wasted by the consumers. Potential losses of food are expected to be large and regrettable since many people around the world are suffering from a lack of food (Loke & Leung, 2015). According to Teller et al., (2018), many foods are cooked but not eaten; thus, leading to food waste. It can be divided into two, that is pre-consumer and consumer food waste. According to Gustavsson et al. (2011), pre-consumer food waste is when the food does not reach the consumer and is recycled while consumer food waste is when the food is lost while or after the consumer consumes it and if there is a lot of food, there tends to be food waste. Food wastage was estimated to happen in every section of the food supply chain (Gustavsson et al., 2011). According to Delley and Brunner (2018), there are two types of food waste in the food supply chain, which are animal and vegetable produce. The first food waste in the food supply chain that is taken into account is animal products for processing, storing, delivering and

consumption (Liljestrand, 2017). The animal products include pork, poultry meat and fish produced during fishing.

In terms of losses, it can happen due to the death of an animal during the breeding process or milk loss due to the decrease of milk production because of cow illnesses such as mastitis, which refers to the disease of the tissue in the breast (Szabó-Bódi et al., 2017). While processing, the meat produce section has losses while slaughtering and also during the manufacturing process such as the production of sausages, and the smoking, salting or canning of fish, and during the production of milk, losses happen due to the treatment of milk such as pasteurization or when processing the milk into yoghurt or cheese (Gustavsson et al., 2011). The second food waste in the food supply chain is vegetable produce and products such as products of agriculture, crop processing and storing, processing, delivery and food consumption (Christ & Burritt, 2016). Food losses that come about during the processing and storing of crops are the result of leakages and break down during processing, storing and delivering between cultivation and moving to the consumer (Liljestrand, 2017). Rezaei and Liu (2017), also stated that waste related to crops happen due to the producer's failure to meeting the standards of quality set by the customers. During delivery, losses can happen at retail businesses such as supermarkets, wholesale supermarkets, night markets, wet markets or retailers (Gustavsson et al., 2011). For food consumption, losses happen during consumption at a domestic level (Setti et al., 2016).

### **Food Waste in Malaysia**

The government has introduced many programmes to cope with food waste such as recycling programmes and campaigns and has also provided facilities for solid waste, but it was unsuccessful as the total waste is increasing every year (Bong et al., 2017). However, as a result of improper waste management, consumers do not practice recycling although there is sufficient knowledge and understanding of the effect on the environment (Ayob et al., 2016). A study conducted by Begum et al. (2006) on the cost-benefit of reducing waste disposal sites showed that proper waste management plays a significant role in environmental improvement which can later help the country save money in building more waste disposal sites (Lanfranchi et al., 2016). The government has come up with various activities in reducing such in Malaysia. Rigorous promotions were conducted for waste separation (Ayob et al., 2016). Consequently, a strategy was developed and launched in early September 2015 as the focus was more on consumer behaviour (Esa, 2017). The programme, which is known as the "Separation of Solid Waste at Source", was conducted to make the separating of waste mandatory (Razali et al., 2017). In addition, another initiative was introduced by Shah Alam Local Authority in 2018 where a food waste bin is located at each house in Shah Alam residential areas to ensure that food waste is not mixed with other household waste (Omar, 2016).

### **Theory of Planned Behaviour**

The Theory of Planned Behaviour (TPB) is considered as a model to examine a person's behaviour from the perception of an individual, factors for decision making, and the environment (Russell et al., 2017). TPB theoretical framework is suitable to measure consumer behaviour (Ajzen, 1991). As stated in the theory, a person's behaviour was measured by the person's preparation to conduct certain behaviour (or known as intention) whereby it is affected by the person's subjective norm, attitude and perceived behaviour control (Visschers et al., 2015). Subjective norm signifies an observation of pressures from society who believe that the individual should or vice versa act or perform in a certain way. Meanwhile, attitudes signify self-performance evaluations that are either positive or negative behaviour. Perceived behavioural control states the ease to perceive or difficulty in behaving a certain way (Mohamad Arshad et al., 2011). TPB is used as a base in analysing or exploring the relationships that force or drive a person's behaviour (Ayob et al., 2016). Therefore, this study applied the TPB model to examine consumer behaviour in terms of their intention towards reducing food waste.

According to Ajzen (1991), the three models are subjective norm, attitude and perceived behavioural control.

### **Subjective Norm**

Subjective norm is related to an individual or a group of people who agree or disagree in showing certain behaviour (Ajzen, 1991). According to Mohamad Arshad et al. (2011), the subjective norm is the perception of an individual regarding their beliefs and values that are affected by the people they respected and considered important. An example of a subjective norm is if a person thinks that the people they perceive as important believe in performing a certain behaviour, they will then influence their intentions to do that certain behaviour (Aktas et al., 2018). Subjective norm is measured by asking the intended respondents how people that are important to them would agree or disagree if they show a certain type of behaviour (Ajzen, 1991). Such important people refer to people who are close to them that can affect their behaviour such as family, other family members, husband or wife and friends or anyone they consider as important in their life (Ayob et al., 2016). The results of correlation between subjective norm and behaviour are usually between .40 to .80 (Ajzen, 1991). According to Mohamad Arshad et al. (2011), it is usually friends who will influence a person into doing a certain behaviour.

### **Attitude**

Attitude is when an individual has an evaluation of either favourable or unfavourable to perform or not perform certain behaviour or interest (Ajzen, 1991). This can also affect the person's cognitive belief and perception about that behaviour and their intention in doing certain behaviour (Russell et al., 2017). In a situation of behavioural attitudes, each belief is connected to the behaviours' result or any other aspect such as the outcome that occurred by executing the behaviour (Lavén & Armbrrecht, 2017). If the person's intention towards doing a certain behaviour is strong, the possibility of performing the behaviour increased (Ayob et al., 2016). Other than that, attitudes towards certain behaviour are believed to be impacted by their knowledge and consequence of that behaviour. According to Visschers et al. (2015), attitude is a good indicator of performing certain behaviour (Stangherlin & de Barcellos, 2018).

### **Perceived Behavioural Control**

Perceived behavioural control is when a person perceives ease or trouble in performing certain behaviours considering their obstacles and experiences (Ajzen, 1991). Furthermore, it is also a personal belief about whether a person can do a planned behaviour and have the perception that the decision is in the person's control (Parizeau et al., 2015). It is also known that perceived behavioural control influences their beliefs (DeLorenzo et al., 2018). It is considered as a perceived capability to perform certain behaviours (Sigurðardóttir, 2017). The result and intentions of a person have an effect on perceived behavioural control or what they believe and consider their capability is in performing that behaviour (Stangherlin & de Barcellos, 2018). Furthermore, it is also used in predicting behavioural outcomes (Ayob et al., 2016) such as if the person believes that they can manage the factors of a situation so that he or she can have the intention of doing certain behaviour (Lavén & Armbrrecht, 2017). Nevertheless, if the person cannot manage the situation, he or she will not or will become uninterested in doing certain behaviours (Russell et al., 2017). For that reason, perceived behavioural control can influence and affect intention in doing certain behaviours, as in having intentions applied to willingness in behaving a certain way (Mohamad Arshad et al., 2011). In addition, perceived behavioural control is possibly a barrier to performing certain behaviours (Visschers et al., 2015).

## **The Relationship Between Subjective Norm And Consumer Food Waste Behaviour**

According to Ajzen (1991), the subjective norm is the recognition that significant people will influence a person's perception of reacting towards a situation. Subjective norm is identified as a behaviour where an individual corresponds to another individual's belief that one should or should not behave in a certain way (Aktas et al., 2018). Many studies have deduced that subjective norm is one of the important aspects of behaviour in determining the reduction of food waste (Aktas et al., 2018; Ayob et al., 2016; Lavén & Armbrecht, 2017; Russell et al., 2017; Sigurðardóttir, 2017; Visschers et al., 2015). A study conducted by Visschers et al. (2015) on determining the predictors of food waste behaviour showed that subjective norm is not related to food waste behaviour-which is similar to Ayob et al.'s findings (2016), as they also reported that subjective norm is not important in behavioural control. Similar findings were reported by Lavén & Armbrecht (2017) that subjective norm does not affect behaviour regarding food wastage in a restaurant.

On the contrary, using the value belief norm theory and the theory of planned behaviour, Sigurðardóttir (2017) concluded that subjective norm is a significant factor with regards to minimizing food waste among households in Reykjavík. Russel et al. (2017) also reported similar findings after conducting a study that used a combination of theories, namely, the theory of planned behaviour, a comprehensive model on environmental behaviour and also the theory of interpersonal behaviour. A study conducted by Aktas et al. (2018) in Qatar confirmed that food waste and subjective norms have a significant relationship. Therefore, the subjective norm is hypothesized as a relationship between subjective norm and consumer food waste behaviour (H1).

## **The Relationship Between Attitudes and Consumer Food Waste Behaviour**

Attitude is the level of a person's perception either in favour or not towards certain behaviours (Ajzen, 1991). The attitude was described by researchers as a reliable indicator towards food waste (Aktas et al., 2018; Ayob et al., 2016; Lavén & Armbrecht, 2017; McCarthy & Liu, 2017; Parizeau et al., 2015; Russell et al., 2017; Sigurðardóttir, 2017; Visschers et al., 2015). The researchers stated that attitude is an evaluation of psychology that prevents the reduction of food waste and that if any of the consumers have a good attitude, the intention to reduce food wastage may arise. However, Visschers et al. (2015) stated that attitude is not related to food waste behaviour. Similar findings were reported by Sigurðardóttir (2017) and Russel et al. (2017), where attitude and behaviour were not significantly related. Parizeau et al. (2015) believed that studying household behaviour can help plan good waste management. Therefore, it is hypothesized that attitude is significantly related to consumer food waste behaviour (H2). Although there are contradicting findings among previous researchers, the contradiction could be due to the consumers' lack of awareness towards food waste and its effect on the environment (McCarthy & Liu, 2017). In addition, this hypothesis, that attitude is the predictor of consumer behaviour, is further supported by previous studies by Karim Ghani et al. (2013), Pakpour, Zeidi, Emamjomeh, Asefzadeh and Pearson (2014), Miroso, Munro, Mangan-Walker and Pearson (2016) and Ayob et al. (2016). The results of the research are important and can contribute to focusing more on waste separation programmes that support the objective of Malaysia in sustaining as a developing country.

## **The Relationship Between Perceived Behavioural Control and Consumer Food Waste Behaviour**

Perceived behavioural control (PBC) refers to the perception of a person concerning their inclination to perform certain behaviours or not (Ajzen, 1991). Therefore, this paper will evaluate the consumers' intention concerning reducing food waste in a certain situation (Ayob et al., 2016). An individual considers that that behaviour is influenced by opportunities and resources (Aktas et al., 2018; Ayob et al., 2016; Lavén & Armbrecht, 2017; Russell et al., 2017; Sigurðardóttir, 2017; Visschers et

al., 2015). According to Lavén and Armbrecht (2017), perceived behavioural control did not affect food waste behaviour. Similar to Aktas et al. (2018), perceived behavioural control did not have a significant relationship with food waste behaviour. Therefore, the perceived behavioural control is hypothesized, as there is a relationship between perceived behavioural control and consumer food waste behaviour (H3). This hypothesis is supported by Visschers et al. (2015) as they studied to determine the predictors of food waste behaviour and the result was that perceived behavioural control is related to food waste behaviour. Similar to Ayob et al. (2016), Russel et al. (2017) and Sigurðardóttir (2017), perceived behavioural control is also important concerning behavioural control.

## **METHODOLOGY**

This study quantitatively measured consumer's behaviour in Kuantan because it has more landfills due to a higher volume of waste compared to other states in Malaysia. According to a statistic from the Department of Statistics in Malaysia (2018), the total population aged between 18 and above in Pahang is 340,000 after rounding up the total. According to Krejcie and Morgan (1970), with a 5% of margin error with 95% of confidence level, the total sample size of 384 respondents will be included in this research. While according to Isaac and Michael (1981), with 5% of error, the sample size is 348 respondents. Therefore, considering bad samples and the possibility of having more than 10% missing data, this study collected 400 respondents for the sample size in Kuantan (Hair et al., 2014). Self-administered surveys were collected by approaching consumers in three shopping malls in Kuantan which were East Coast Mall, Berjaya Megamall and Kuantan City Mall. Other than shopping malls, the questionnaires were also distributed in Teluk Cempedak, Kolej Yayasan Pahang and University Malaysia Pahang. Additionally, the questionnaires were distributed via Google form to the respondents by way of social networks such as Facebook, Instagram and WhatsApp. In this study, 98 respondents (24.5%) responded via Google form and 302 respondents (75.5%) responded via hard copy in Kuantan.

Data analysis was conducted to solve the research objectives, questions and to examine the hypotheses. The data was analysed by using SPSS (version 20) (SPSS, Inc.). In this research, the items used in the questionnaire were adapted from previous researches that comprised of three main independent variables, namely, subjective norm, attitude and perceived behavioural control, with consumer food waste behaviour as the dependent variable (Aktas et al., 2018; Lavén & Armbrecht, 2017; McCarthy & Liu, 2017). A five-point Likert scale was used in getting responses from the respondents; scale 1 for strongly disagree, scale 2 for disagree, scale 3 for neutral, scale 4 for agree and scale 5 for strongly agree. The higher scores given by the respondents mean that they agree with the questions or statements given. Before the actual data collection, the questionnaire was subjected to a pre-test by experts for content validity. Three experts were involved in this test; they were experts who evaluated the clarity of the statements, the presentation of the questionnaire and also the suitability of the statements among the respondents. Amendments were then made after receiving feedback from the experts. After the questionnaire was amended, a pilot study was conducted where it was distributed to 50 conveniently selected respondents in Malaysia. A pilot study is an important step to take before distributing questionnaires to respondents. The reason for conducting a pilot study is to ensure that the respondents could comprehend the wordings of the questions. Other than that, it is also for checking whether the questions are in the correct sequence (Kumar et al., 2012).

**Table 1: Cronbach's Alpha values before and after deletion of items obtained from the pilot study (n = 50)**

Constructs	Before Deletion of Items		After Items were Deleted		Strength of Association
	Cronbach's Alpha	N of Items	Cronbach's Alpha	N of Items	
Subjective Norm	0.775	9	0.805	5	Good
Attitude	0.714	10	0.789	5	Good
Perceived Behavioural Control	0.485	8	0.695	4	Moderate
The Consumers' Behaviour	0.313	8	0.635	4	Moderate

Note: N=50. Cronbach's Alpha: Poor (< 0.06); Moderate (0.6 to < 0.07); Good (0.7 to < 0.8); Very Good (0.8 to < 0.9); Excellent (0.9)

For the pilot study, a reliability test was used to measure the consistency and accuracy of the scale. This analysis used Cronbach's alpha which is common for measuring reliability and used when the researcher has multiple items in the questionnaire. Table 1 shows the Cronbach's alpha values involving 50 respondents in this pilot study. The Cronbach's alpha value was determined for each respective variable resulting in Cronbach's alpha values ranging from 0.635 to 0.789. The main objective of this research is to concentrate on consumer food waste behaviour. The following hypotheses of this research were tested using Pearson correlation analysis: H1: The relationship between subjective norm and consumer food waste behaviour; H2: The relationship between attitudes and consumer food waste behaviour; and H3: The relationship between perceived behavioural control and consumer food waste behaviour. The analysis will answer the hypotheses. Table 2 shows the Pearson correlation analysis output to test hypotheses. Based on the Pearson correlation analysis shown in Table 2, the correlation (r) between the variables is between  $-0.051 \leq r \leq 0.429$ .

**Table 2: Pearson Correlation Analysis**

		ALLSN	ALLA	ALLPBC	ALLTCB
ALLSN	Pearson Correlation	1			
ALLA	Pearson Correlation	.429**	1		
ALLPBC	Pearson Correlation	-.053	-.051	1	
ALLTCB	Pearson Correlation	.140**	.136**	-.266**	1

Note: \*\*. Correlation is significant at the 0.01 level (2-tailed); N=391. Correlation: Very high correlation ( $\pm 0.9$  to  $\pm 1$ ); high correlation ( $\pm 0.7$  to  $\pm 0.9$ ); moderate correlation ( $\pm 0.5$  to  $\pm 0.7$ ); low correlation ( $\pm 0.3$  to  $\pm 0.5$ ); very low correlation ( $\pm 0.0$  to  $\pm 0.3$ )

However, as can be seen in Table 3, all independent variables were significantly correlated with the dependent variable. Subjective Norm and Attitude were positively correlated with consumer food waste behaviour, whilst Perceived Behavioural Control was negatively correlated with the dependent variable. Unfortunately, all variables had a very low correlation with the dependent variable.

**Table 3: Summary of the Relationship between Independent Variable and Dependent Variable**

Variables	P-value	Result
Subjective norm and the consumers' behaviour	> 0.05	Significant relationship
Attitudes with the consumers' behaviour	> 0.05	Significant relationship
Perceived behavioural control with the consumers' behaviour	> 0.05	Significant relationship

**Table 4: Results of Multiple Regression Analysis to Predict from Independent Variables to Dependent Variable**

Predictor	R <sup>2</sup>	Adj R <sup>2</sup>	F Change	Unstandardized Coefficients (β)	Standardized Coefficients (β)	Sig.	t
DV: The Consumers' Behaviour	.092	.085	15.006	3.278		.000	8.611
<b>The Consumers' Behaviour by each dimension:</b>							
• Subjective Norm				.199	0.90	.093	1.684
• Attitude				.133	0.084	.117	1.570
• Perceived Behavioural Control				-.191	0.257	.000	-5.289

Note: \* $p < 0.05$ , Dependent Variable = the Consumers' Behaviour. Predictors: subjective norm; attitudes; perceived behavioural control

Based on Table 4, the consumers' food waste behaviour can be explained by 9.2% of the variance in the subjective norm, attitudes and perceived behavioural control. According to Hair et al. (2014), for studies that predict behaviour, usually, the value of R-squared is lower than 50% because a person's behaviour is hard to predict. A coefficient that has a p-value less than alpha is statistically significant. The coefficient for perceived behavioural control (-.191) is statistically significant because the p-value is less than 0.05 ( $p < 0.05$ ). However, the coefficients for subjective norm (.133) and attitude (.199) are not significantly different statistically because the p-values are larger than 0.05 ( $p > 0.05$ ). In conclusion, the predictor for consumer food waste behaviour is perceived behavioural control.

## RESULT AND DISCUSSION

For this research, the data was assumed to be normal based on a study by Hair et al. (2014), who stated that the sample size should be more than 200 and the skewness should be close to zero. The data was analysed for outliers. There were 9 outliers after it was tested using the Mahalanobis distance. The outliers were deleted to minimize their influences. Hence, the total number of usable questionnaires were 391 after the deletion of the 9 outliers. The relationship between subjective norm and consumer food waste behaviour based on the first hypothesis is "there is a relationship between subjective norm and the consumers' food waste behaviour" (H1). Subjective norm is the recognition that significant people can influence a person's perception of reacting towards a certain situation (Ajzen, 1991). There is a positive relationship between subjective norm and the consumers' food waste behaviour which is in line with previous findings, such as the one by Sigurðardóttir (2017), who concluded that subjective norm is a significant factor in food waste minimisation among households in Reykjavík. Russel et al. (2017) also reported similar findings. It is in conjunction with a study conducted by Aktas et al. (2018) in Qatar that confirms that food waste and subjective norm have a significant relationship. According to Aktas et al. (2018), friends and family have a positive relationship with subjective norms and it is similar to this study, where most of the respondents believe that friends and family can influence them to not waste food. However, Lavén and Armbrrecht (2017) and Ayob et al. (2016) found that subjective norm is not related to food waste behaviour. Other researchers, on the other hand, the subjective norm was opted out of their studies even though they used the theory of planned behaviour (Lavén & Armbrrecht, 2017). Subjective norm is not a predictor of consumer food waste behaviour, which is similar to Visschers et al.'s findings (2015) as stated in their studies that because food waste is not important to significant people, that is why they are not able to influence in the minimization of food waste (Visschers et al., 2015).

The second hypothesis was that there is a relationship between attitudes and consumer food waste behaviour (H2). There is a positive relationship between attitude and consumer food waste behaviour. Attitude is the level of a person's perception either in favour of or not towards certain behaviours

(Ajzen, 1991). This study found that there is a relationship between attitude and consumer food waste behaviour. It is in agreement with the previous studies that attitude can relate to consumer food waste behaviour as their findings show that they believe wasting food is a waste of money as it relates to the money spent on food shopping because the more they bought, the more food waste was generated (Visschers et al., 2015). According to Ayob et al. (2016), this finding is important in providing suitable programmes or campaigns related to waste management to support Malaysia's aspiration of transforming into a sustainable developing country. Similarly, Lavén and Armbrecht (2017) and Aktas et al. (2018) concluded that attitude is the strongest behaviour regarding food waste behaviour. However, this study's result has a different outcome from Visschers et al. (2015), Parizeau et al. (2015), Sigurðardóttir (2017) and Russel et al.'s (2017), as their result of the study was that attitude is not a significant factor towards the minimization of food waste. Based on the results of this study, attitude is not a predictor of consumer food waste behaviour, which is similar to McCarthy and Liu's findings (2017), as they found that there is a contradiction between attitudes and behaviours as there is a lack of awareness among consumers regarding food waste and its effect on the environment.

Finally, H3 proposed that there is a negative relationship between perceived behavioural control and consumer food waste behaviour, the existence of which (the relationship) will be analysed by way of the Pearson correlation analysis and multiple linear regression analysis. Perceived behavioural control (PBC) refers to the perception of a person concerning their inclination to perform certain behaviours or not (Ajzen, 1991). Based on the result of this study, perceived behavioural control has a significant relationship with consumer food waste behaviour, which is similar to Ayob et al.'s findings (2016), as their result on perceived behavioural control is related to food waste behaviour. This is because the consumers feel that they can do something about the food wasted in their household (Visschers et al., 2015). Besides that, Sigurðardóttir (2017) and Russel et al. (2017) also have the same results as their study found that behavioural control is also a predictor of consumer food waste behaviour.

## **CONCLUSION**

In conclusion, food waste is a major problem in Malaysia as landfills keep increasing because food waste cannot be recycled. This study stated that subjective norm, attitude and perceived behavioural control play an important role in determining consumer food waste behaviour. The result of this study shows that subjective norm and attitude have a positive relationship with consumer food waste behaviour, but perceived behavioural control has a negative relationship with consumer food waste behaviour. Therefore, perceived behavioural control is the predictor for consumer food waste behaviour. The limitation faced by this research was dependence on self-reported data in Kuantan only. There should be a study on another city as well, not limited to only one city, and future researchers should make a comparison on how other countries deal with food waste. Other than that, there should be studies on actual food waste by consumers, and how to prevent and reduce food waste in Malaysia to minimize waste being sent to landfills. As a result of doing all of this, the studies will be more detailed and broader in terms of food waste and food waste management. They can also provide additional information on the importance of minimizing food waste and means of taking action to reduce food waste. The findings of this study can help producers or manufacturers as they can find other alternatives in minimizing food waste because consumer behaviour towards food waste is hard to change. It is also important for government bodies such as the Ministry of Housing and Local Government, and also Solid Waste Corporation (SWCorp) to propose new policies in minimizing food waste, interventions and campaigns on food waste management.

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