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Household Food Waste Prevention in Malaysia: An Issue Processes Model Perspective

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Household Food Waste Prevention in Malaysia:

An Issue Processes Model Perspective

by

Syahirah Abd Razak

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts

The Zimmerman School of Advertising and Mass Communications
College of Arts & Sciences
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DEDICATION

This thesis is dedicated to the memory of my mother who passed away on April 28, 2012.

There are no words to express how much I miss you. A wonderful woman who touched many lives. Mother, sister, aunt, grandmother, and wife. You are my inspiration. Love you forever.

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ABSTRACT

Food waste has been a worldwide concern for several decades but this problem is relatively new in the Malaysian context due to the increasing amount of food waste in recent years. Thus, the goal of the study is to provide the basic information of knowledge and involvement level, and their interaction in food waste prevention among households in Malaysia. This study seek to further mass communication research in the area of food waste. The Hallahan's Issues Processes Model was used within this study in order to determine the relationship between knowledge, involvement, and food waste prevention behavior. The convenience sampling method was adopted and the surveys were conducted using the online survey tool, Qualtrix. The data were analyzed using SPSS 22.00 software. The results supported the hypotheses that the level of knowledge has a positive impact on food waste behavior only if the household's involvement is high and vice versa. According to this model, Malaysian households fall under the category of an active audience, because they recognize the negative consequences and their acceptance that food waste prevention is personally relevant in their daily life. The findings of this study contribute further recommendations for government campaign that could focus on enhancing household planning skills and routines when it comes to the food preparation. Furthermore, the need for educational campaign against food waste should focus on selected information such as demographic background and presented in mass media to stimulate model behavior in the households.

CHAPTER 1: INTRODUCTION

Problem Statement

Food wastage is becoming a global phenomenon. Statistics imply an estimated one-third of edible food meant for human consumption is thrown away globally. This constitutes roughly 1.3 billion tons each year (FAO, 2011). In the United States alone, the amount of food waste in 2013 reached 37 million tons, where only 5% of that amount (1.84 million tons) was recovered, while the balance, 35 million tons of waste were sent to landfills and incinerators (EPA, 2016). Citing another report by the European Commission, it is estimated that their 27-member states generate approximately 89 million tons of food waste (European Parliament, 2012) Germany on it's own throws away 18 million tons of food every year (Brüggemann, 2016). Food wastage is considered an alarming factor that could hinder the prospect of sustainable development.

Food for human consumption is wasted along the food supply chain in five main stages: agricultural production, after harvest and storage, during food processing, distribution, and consumption (Gustavsson et al., 2011). Food waste sources are sorted into three groups: food losses (food lost during preparation, processing, and production), unavoidable food wastage (the spoiled part of food lost during the consumption phase such as fruit peel and core) and avoidable food wastage (food lost during the consumption phase such as wastage) (Thi et al, 2015).

Parfit et al. (2010) states that food losses occur at the end of a food supply chain due to behavior patterns by retailers and consumers. Food and inedible parts of food are not included since waste is measured by food related to human consumption. According to the FAO (2013)

definition, food losses or waste are “the masses of food lost or wasted in the part of food chains leading to edible products going to human consumption.” (p. 23). Higher income countries such as those in Europe contribute the highest food waste from the distribution and consumption areas (i.e. household level). In lower income countries such as those in Sub-Saharan Africa, food losses stem during agricultural and post-harvest stages (Kummu et al., 2012 & Parfit et al., 2010).

Factors Influencing Food Waste

Lately, an increase in attention on food waste problems within the academic and social levels are visible. Radzyminska (2016) mentioned that the number of studies that examined food waste as a result of irresponsible behavior in society has increased. Such studies revealed that food consumption behavior (e.g., waste reduction, reuse, and recycling) is a crucial aspect in addressing the food waste problem. At an individual level, it is recognized that people could shape their own behaviors through informed decision making (USAID, 2012). Furthermore, Stern (2000) argues that “behaviours impacting the environment are environmentally significant behaviors whereby changes in behavior patterns are insufficient in deciding environmentally significant behavioral indicators.

Food waste generation can be classified as the food waste total weight per year (tonnes/year) and per capita (kg/year). Per capita food waste in developed countries (e.g.: Europe and North America) is 107 kg/year, while that for developing countries (e.g.: sub-Saharan Africa and South/Southeast Asia) is 56 kg/year (Gustavsson et al., 2011). In developed countries, food losses and waste are highly related to consumer behavior, while the relationship is less certain in developing countries (FAO, 2011). The main reason behind this predicament is that in developing countries it is considered economically and morally unacceptable to waste food where poverty and low-income levels still prevail (Raats et al., 1995; Brook, 2007; Stefan et al., 2013). In developed countries though, the mindset of consumers is the opposite.

Nevertheless, drawing public attention to waste reduction is essential during the initial phase in stimulating behavioral change in a developing country.

Research demonstrates that the total quantity of household food waste generated varies as a function of several factors, including household size and composition (WRAP, 2009a), household income (Brook, 2007), household demographics (Hamilton et al. 2005), and household culture (Parfit et al., 2010). Waste & Resources Action Program (WRAP) research revealed that four main causes of waste food are supermarkets, poor planning/food management, lack of skills, and personal choices and lifestyles (WRAP, 2007). WRAP (2007) also identified a set of specific reasons for home food waste, including:

- a. Excessive purchases – being tempted by sales such as “buy one, get one free” (BOGOFs)
- b. Increasing perishable food purchases – a result of attempting to eat healthier
- c. Inadequate food organization – not eating food in date order
- d. Impromptu, rather than methodical, ‘spring cleaning’ of stored products
- e. Hypersensitive to expiration date –won’t risk eating food near to its ‘best before’ date, even if it looks fine
- f. Preparing more food than necessary
- g. Too fussy with food choices
- h. Lifestyle choices – too busy to plan meals, or having inconsistent work and social patterns.

The Negative Consequences of Food Waste

Research has identified three major aspects of the negative impact caused due to food waste: social/ethical, environmental, and economic.

Social/Ethical

The concept of social responsibility lies deeply rooted in a system of moral philosophy, in which individual decisions and actions must be ethically acceptable. Food waste is socially and morally unacceptable due to the fact that many still live in hunger. As global population is expected to increase in the future, food waste elevates the constraints of food shortage and availability (Godfray et al., 2010). According to the World Food Program (2017), 795 million people – one in nine – go to bed on an empty stomach every night in a world that produces enough food to feed everyone. Even in America, one of the most affluent countries, 49 million people depend on donated food to survive. Moreover, food discarded by retailers and consumers alike in developed countries would be more than enough to feed all the hungry people in the world. Reducing food waste is thus a necessary step toward reducing hunger in this world (Huffman, 2015).

Environmental

Approximately 95% of food waste ends up in landfills or combustion facilities. The disposal process for food waste has become one of the largest sources of greenhouse gases (GHG) emission, which contributes to climate change (EPA, 2016). Food waste ultimately contributes to the production of methane, a greenhouse gas 25 times more potent than carbon dioxide (Jereme, 2016). If wasted food were a country, it would be the third largest producer of carbon dioxide in the world, after the United States and China. As such, food waste prevention has become an important environmental topic as it provides a compelling opportunity to diminish environmental concussion caused by food consumption habits (Gottfried et al., 2015).

Economic

From an economic perspective, food waste debilitates food security through exhaustion of constrained resources. Food served daily consumes many resources, including 70% of all water usage around the world from growing crops to food preparation. Moreover, wasting food is the same as wasting energy since food processes also involve finite resources such as diesel for field equipment and transportation purposes (Nur Imani, 2016). Additionally, reducing food waste makes economic sense as it will further reduce costs for farmers, processors, restaurants, and assist in lowering household bills (Bell, 2012).

Food Waste in Malaysia

Food waste has been a persistent problem globally for a long time. Nevertheless, this phenomenon, is relatively new in Malaysia due to the rapid increase in the amount of food waste over the years. Drastic economic development, coupled with rising commercialization and urbanization, has resulted in large and increasing amounts of food waste in Malaysia. Malaysia wastes 15,000 tons of food daily, including 3,000 tons that are still good for consumption and should not have to be discarded (The Star, 2016). The average Malaysian throws away 1.64 kg of waste daily, compared to the worldwide average of 1.2 kg. The above statistics are alarming, as Malaysia's waste production will increase by 65% to 30,000 tons daily by the year 2020 (Khor, 2014). Unconsumed food waste that consists of expired bread, rotten fruits, and eggs (not including leftover food) has doubled over the past three years (Jereme et al., 2016).

Bearing critical importance to the food chain is food waste produced at the household level (i.e., waste from private domestic accommodation or residential homes). This is due to the fact that households contribute the highest percentage of food waste generated in Malaysia (Table 1) compared to in developed countries (Parfit et al., 2010; Sharp et al., 2010). Difference

in income levels is an important influencing factor that contributes to the amount of food waste, with the total amount of food waste higher in urban areas as compared with rural areas (Jereme et al., 2016).

Table 1: Food waste generated in Malaysia

Estimated food waste generated in Malaysia	Generation rate		
	(tones/day)	(tones/year)	Percent
Households	8,745	3,192,404	38.23
Wet and night markets	5,592	2,040,929	24.50
Food courts/restaurants	5,319	1,941,608	23.35
Hotels	1,568	572,284	6.87
Food and beverages industries	854	311,564	3.41
Shopping malls	298	108,678	1.30
Hypermarkets	291	106,288	1.28
Institutions	55	26,962	0.32
Schools	45	21,808	0.30
Fast food/chain shops	2521	808	0.26
Total	22,793	8,331,589	100

Source: Jereme, I.A. (2016)

A study conducted by the Solid Waste and Public Cleansing Management (SWCorp) ascertained that on average, each individual meal is 0.45 kg. Based on this calculation, approximately 15,000 tons of food waste can provide three meals a day to 11 million people (Mohd Pauze, 2015). In responding to this issue, the government initiated the Save Food Malaysia (MYSaveFood) program in 2015 to spur and nurture constructive efforts in reducing food loss and waste in Malaysia. The current players of MYSaveFood Network include

Malaysia Agriculture R&D Institute (MARDI), Ministry of Agriculture (MOA), Solid Waste and Public Cleansing Management (SWCorp) and Ministry of Health.

Modelled after the SaveFood Campaign, which is a global initiative introduced by the Messe Dusseldorf Group in Berlin, Germany in 2011, coupled with the cooperation from the Food and Agriculture Organization (FAO) of the United Nations (Bernama, 2016), the MySaveFood program in Malaysia was launched as a national campaign to raise public awareness regarding food waste. As Datuk Dr Sharif Haron, Director General of MARDI, succinctly puts it: “We need to educate the public on how much value we put in food.” He also stressed that the campaign is still at an infant stage, thus more efforts are required to reduce food wastage from different aspects (Sharif, 2017). As knowledge is still scarce regarding the kind of attitudinal and control beliefs which are most important in relation to food wastage (Stefan et al., 2013), highlighting the benefits of reducing household food waste by providing more information could support people in decision to reduce food waste (William et al., 2012).

In light of the gravity of the food waste problem, this thesis attempts to examine the problem from a communication standpoint. On another note, this study goes beyond the campaign effectiveness and considers a theory-based research based on the Issues Processes Model (Hallahan, 2001). In particular, this study attempts to fill two voids in food waste prevention communication in Malaysia. The first is to determine the current status of household food waste prevention practices among the Malaysian population. The second is to provide a theoretical supported explanation regarding food waste prevention behavior by examining its relationships with levels of food waste knowledge and involvement among Malaysians.

CHAPTER 2: LITERATURE REVIEW

The communication studies discipline considers the symbolic transmission of meaning in multiple contexts. “The field of social communication is not just a specific discipline, but it also draws on a variety of interdisciplinary fields whose focus either one or more communication elements” (Alcalay, 1983). Communication plays an important role in the creation of identity and social act, which was inspired by persuasion studies during the 1950s and 60s. Today, it continues with most areas in communication studies by dividing themselves along those two channels: rhetoric and social science (Richardson & Byers, 2007). Thus, communication is split specifically into two areas mentioned above, rhetoric or persuasion, while the discipline of social science always extends along with psychology, sociology, anthropology, political science, economics, and public policy (Craig, 2011).

Issues in communication are social developments that can exist freely regardless of the certain conditions on which they are based. While studies of issues appear to be increasing within communication studies, knowledge and involvement are variables used as motivation for action or intent to act in many disciplines. As such, knowledge and involvement can be classified as basic measurements to differentiate types of public. This study uses Hallahan’s Issues Processes as a theoretical framework as this model comprehends the basic understanding to measure the relationship between knowledge, involvement, and food waste prevention behavior.

The output from this Issues Process Model is beneficial as a guidance for public communication campaign strategies. This public communication campaign is defined as

“purposive attempts to inform or influence behaviors in large audiences within a specified time.....to individuals and society” (Rice & Atkin, 2009, p. 3). A successful campaign was utilized by creating informative and persuasive messages that are spread along traditional mass media, latest technologies, and interpersonal networks (Atkin & Rice, 2012). Instead of reaching the broader public, identifying specific segments of the overall population gives an extra benefit to the degree of campaign success. Atkin & Rice (2012) also stated that identifying the audience provides two major strategic advantages; improving message efficiency and increasing the effectiveness of the campaign. Hence, Hallahan’s Issues Processes is chosen as a means to identifying the types of public.

Theoretical Framework

Hallahan’s Issues Processes Model provides the theoretical framework for understanding the key factors involved in food waste prevention, which are: knowledge, involvement, and food waste prevention behavior. As shown in Figure 1, the model outlines the dynamics of issues activation and the types of public involved. According to Hallahan (2001), the model describes “both the antecedent processes of how issues are created and the alternative responses that organizations or institutions could use in responding to such issues.” (p. 33)

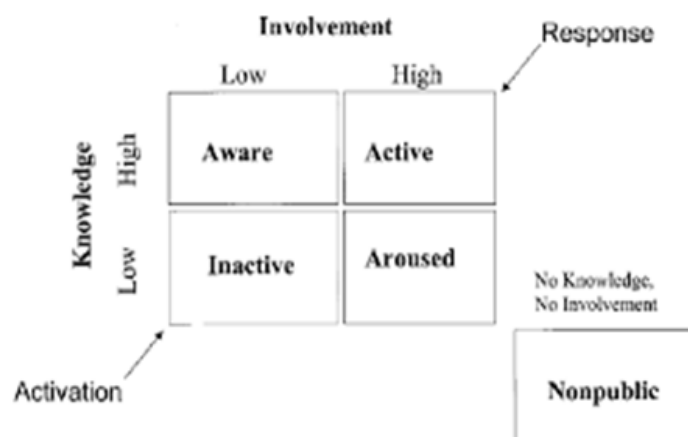


Figure 1: Issues Processes Model (Hallahan, 2001)

Based on the model, “public” is categorized into four areas according to the degree to which they are knowledgeable and involved with a particular issue: active (high knowledge and high involvement), aroused (high involvement and low knowledge), aware (high knowledge and low involvement), and inactive (low knowledge and low involvement). Significantly, the model exhibits the fluidity of individuals to progress from one category to another based on an individual’s knowledge and involvement in particular topics or issues. As such, the model not only extends beyond the more traditional definition of public as either active or passive (e.g., Grunig & Repper, 1992), it also points out the need for organizations to design different communication strategies using the four groups of public when addressing an issue. Nevertheless, the model acknowledges the fact that effective communication must begin with a keen understanding of the public regarding their levels of knowledge and involvement with a particular issue. Broom et al. (2000) further stressed that organizations would be able to better understand the relationship by learning the communications, exchanges, trades, and linkages between the four categories of public.

Knowledge

Knowledge gives precision to lives and permits humans to conceptualize objectives, in order to anticipate and perceive occasions, and to react as per the evolving needs, purposes and wishes (Hunt, 2003, p. 101). According to Ayer (1958), knowledge is a result of procuring and enhancing learning, whereby the power of knowledge is discreet until an individual implements the knowledge to perform some task, make a decision or solve a problem. Knowledge is also an ability factor that indicates the “beliefs, attitudes, and expertise that people hold in memory about a topic” (Hallahan, 2001, p. 35). Past studies pertaining to public relations imply that sufficient knowledge is a prerequisite for problem recognition, perceived control, and involvement in a situation (Grunig, 1987; Grunig & Ipes, 1983; Major, 1998).

Organizations are constantly dealing with various types of audiences. As such, it is of great importance to be aware of the knowledge that an audience may exhibit in order for organizations to react and approach the various understandings levels of audience appropriately. Wang (2006) mentioned that “creating persuasive messages to reach strategically important audience is a critical function in campaign planning” (p. 7). On another note, awareness of the effectiveness to persuasive messages is considered a positive start for organizations in encouraging individuals to practice food waste reduction. This is further supported by Bortree (2010), who concurred that audiences who are more engaged with an organization will enhance cultivation strategies more easily than those who are less engaged. This could possibly lead to a better impact on the quality of the relationships.

Many studies have concurred that there are many factors related to individual/household’s knowledge and ability to handle their food arrangements, storage, preparations, and ways of tackling leftovers (WRAP, 2014). Their apparent lack of knowledge on how to perform beyond expectations and being effective in the use of packaging (WRAP, 2013), or other common mistakes such as misinterpreting the “best before” date (Williams et al., 2012), storing unwanted foods (Wansink et al., 2000), and storing food incorrectly (Terpstra et al., 2005) are a few of the many prevailing factors. Lack of knowledge and skills has been identified as factors that commonly influence household’s behavior toward the food waste problem (Radzaminska, 2016).

Nevertheless, the increase in household interest and knowledge toward good food practice does not essentially trigger any changes in actor’s behavior. Vermeir & Verbeke (2006) argue that “external factors may prevent households from performing and sustaining such practices” (p. 174). The notion extends that, although individuals have at least some knowledge about how to manage food in their household to prevent food waste, they might not perform in line with their knowledge (Witzel et al., 2015). This is consistent with Bettman’s

(1980) study, which shows that when individuals lack knowledge, they do not have the essential ability which in return may cause a lack of desire to perform a certain task. Audiences are competent in practicing and interpreting messages that would work best based on their level of knowledge.

In terms of food waste prevention, it is safe to assume that when an individual has high knowledge about food waste problems and its negative social, ethical, environmental, and economic impact, the possibility of behavioral change is high. On another note, individuals who lack knowledge about the food waste problem are unlikely to engage in waste prevention activities (Miafodzyey, 2013). This is supported by Sujana's (1985) study which further suggests that when individuals have high knowledge regarding a subject matter, they tend to process information using complex schematic processing instead of the piecemeal processing, which is less efficient. In addition, Barr (2007) noticed that individuals with good knowledge about problems linking to food waste are more likely to avoid wasting food. On this basis, the study found a positive effect on the reduction of food waste for those individuals with a general awareness of the food waste phenomenon both in terms of its diffusion and quantification.

Another reason for the current food waste problem is that people lack information and are not informed regarding the environmental predicament. An individual with no food waste consciousness does not understand that food wastage will impact people's sustainability in the future (Jerome, 2016). This is supported by Gökdere (2005) who stated; he/she shows that knowledge leads to preventing food waste because of consumer understanding of its effect on the environment. By addressing the knowledge level of consumers, it could enhance how the expected message will be handled. It would assist organizations in acquiring the necessary strategies to prepare in conveying the message.

Literature has further mentioned that having high knowledge contributes to better information processing and an individual is better prepared to make sense of food waste issues which will provoke an immediate action (Hallahan, 2001, p. 35). People become more alert to their responsibility in preventing food waste which moves them to gain more knowledge and be more active. Hence, higher levels of knowledge might prevent certain barriers to making changes on how individuals handle all these activities (e.g., meal planning, shopping, storing, preparing, and cooking food).

Involvement

Involvement is a variable that determines an individual's responses. It has been viewed as an important predictor in public relations scholarship and has become the main component in determining an individual's coordination among the public (Bortree, 2010). According to Heath & Douglas (1990), involvement is an influential factor on how organizational communication is profusely meticulous. Several scholars accept that communication through innovation is more effective if the level of empathy is high and there are similarities between sender and receiver (Alcalay, 1983). Although there are variations of involvement definitions within social and consumer psychology subject matters, Petty & Cacioppo (1983, p. 136) state that high involvement messages result in better personal relevance and highlights more personal connections.

People refuse to process information unless they perceive a certain relationship between them and a problem, defined as the "level of problem recognition" (Grünig, 2005). "People who are actively involved with public policy issues have better-formed cognition about those issues and should be willing to engage in individual actions related to them" (Grünig, 1987, p. 30). The author reaffirmed that if there is an increase in involvement, it is considered a motivation for people to gain new information. Indeed, Renn et al. (1995) claim that arguments regarding public involvement are necessary due to the fact that the government needs public

support to be able to implement policy changes. Hence, recent research studies such as the one by O’Faircheallaigh (2010) proposes public involvement to be better segmented in terms of definition, improving the quality of engagement.

The level of involvement generally uses resulting behaviors as an indicator (Zaichkowsky, 1985). Public that engage in any food waste activities are indirectly aware of the issue and this should encourage them to minimize their food waste. Previous studies also prove that campaigns and enlightenment programs that raise awareness of food waste recycling were able to reduce the projected waste up to 50 kg per day compared to the expected 500 kg/day during the campaign day (MPSJ, 2009). Public who are found to be more positive toward the issue seemed to have a change in their behavior after being involved directly with the campaign. This is in line with Jereme’s (2013) study which shows that the attitude and behavior of the surrounding individuals are more likely to influence the public toward minimizing food waste and disposal.

Although there are many areas of disagreement concerning the involvement concept (see Sherif et al. 1965, Petty & Cacioppo, 1983), Krugman (1965) proposed that if involvement level increases, the sequence of communication impact might shift and there is a possibility of a decrease in movement from resistance to persuasion. This alternative view has been accepted among consumer researchers. In other words, when there is high involvement, communication will firstly affect cognition, followed by attitudes and behavior. This communication acts as a mediator in modifying belief. As an example, this notion can be identified in the awareness campaign implemented in the United States in reducing wasteful household food management practice using a Toolkit of “Food: Too Good to Waste”. Besides actively engaging participants in learning how to manage their food, this program provides great information through effective outreach and education when there are high involvement levels (EPA, 2016, p. 5).

Many profound tactics could be used by organizations to encourage the public to become highly involved in the food waste issue. Smith (2005) mentioned that organizations can use audience-site strategies such as petition drives, community programs, and engagement in community events in order to spark involvement within stakeholders. When knowledge and involvement are both presented in food waste prevention, the public has an opportunity to construct the skill necessary in addressing daily food activities and to build connections between them. Additionally, personal interests that an individual might possess in this food waste issue makes their volunteerism more involved than just their level of education or socioeconomic status (Donohue et al., 1975).

The interaction between knowledge and involvement

A higher level of knowledge along with higher involvement in a certain issue is categorized as an active public. High levels in both dimensions can lead people to become leaders and for them to be more willing to utilize their time and effort to make a change (Hallahan, 2001. p. 34). This segment will have more priority over other stages, which are; aware, aroused, and inactive public due to the fact that their interest is greater. Rawlins (2005) emphasizes that “whether stakeholders will become active public can be predicted by a few notions, particularly: whether the problem involves them, whether they recognize the problem, and whether they think they can do anything about it” (p. 10). Hence, organizations must actively communicate the issue of food waste through active public and maintain a high public profile domain.

Individuals or groups with high levels of involvement but low knowledge about the issue are defined as aroused public. Individuals in this category are the ones recognizing and connecting personally with the situation, and as such who will begin seeking the information. They might then become active once they have captured the important knowledge, skills, and extra encouragement (Hallahan, 2001, p. 34). This type of public is more likely to need support

from food waste organizations to be able to carry out activities that can transform an aroused public to a higher state of activism, “organizing activities that spur in increasing the capability of potential challengers to act as a unit” (Gamson, 1992, p. 72).

As stated by Hallahan (2001), aware public are individuals with high knowledge about the problem, but who are limited in terms of personal involvement. This group of people usually present themselves as opinion leaders (p. 41). Sukumaran (2013) further stated that detailed aware public as members who are aware of the existence of a commonality of values or interest with the organization, but who have not made any organized efforts to respond to such relationships. To encourage and stimulate the interest of this public, assistance from organizations are much sought after to get them organized and active within the organization context.

Inactive public refers to individuals who have low levels of both knowledge and involvement but are important elements to an organization. Extra effort is required to push inactive public to become active. Among the moves to encourage the domain include making them recognize the matter as problematic, have self-belief that they can contribute and lastly, be determined to be involved in any of the activities. Motivation from the organization or surrounding public is vital in stimulating the said category in becoming active as “they might not be predisposed to engage in any organized activity to effect change without being motivated by heightened self-interest” (Hallahan, 2001, p. 35). Lastly, the non-public (the default category) represents the group with no knowledge and involvement on a specific issue. As such, they are commonly ignored as they are unlikely to become aware or involved.

The interaction of knowledge and involvement must be present simultaneously to allow public knowledge of their roles and responsibilities needed to reduce wastage in their consumption behavior. Without such knowledge, no action will take place, and vice versa. The

high self-interest within an individual stimulates a compromising inclination to join in any organized activity. Contrary, Hallahan (2001) identified “factors that cause a lack of initiative: belief that no problem exists, failure to recognize a problem, assessment that a problem is not important enough to take action, or belief that nothing can be done” (p. 35).

Food Waste Prevention Behavior

It has been well documented that varying aspects of attitude and behavior can impact an individual’s action towards food waste prevention. Accentuating the importance of reducing food waste by providing more information and knowledge is one of the alternatives to support the public in reducing food waste. Glanz (2009) mentions that “personal attitudes towards edibles, cooking and eating habits, shopping behavior and storage of edibles” of consumers do play an important role in an individual’s intention to reduce food waste (p. 33). The differences in behavior could possibly alter through life experience or a campaign’s intervention. Many studies have been done to investigate types of behavior leading to wasting food and researchers that could draw general conclusions by highlighting different barriers to reduce food consumption by different families due to the fact that handling a household food is a complex process of activities (EPA, 2016).

The WRAP (2007) report listed nine individual behaviors that contribute toward food waste prevention in a particular order as below:

- 1) Advanced meals preparation
- 2) Knowing food inventory before shopping
- 3) Creating a shopping list
- 4) Packaging or wrapping meat and cheese appropriately
- 5) Storing apples and carrots in the fridge
- 6) Freezing foods as necessary
- 7) Portioning rice and pasta
- 8) Eating leftovers
- 9) Organizing food by date

Although such behaviors cover a large dimension of the activities that could reduce food waste in a household, there are also many other alternatives that could contribute to reducing the amount of food waste.

CHAPTER 3: RESEARCH QUESTIONS AND HYPOTHESES

This two-pronged quantitative study was first used to identify the current knowledge level and involvement of Malaysians on food waste prevention. Second, it examined the relationships among knowledge, involvement, and household food waste prevention behavior. Many studies have sought insight into factors which contribute to food waste as well as their solutions. Nonetheless, to the researcher's understanding, very little theory-based research has been done from the public communication perspective in Malaysia. This current research attempts to fill the gap. As stated, Hallahan's Issues Processes Model (2001) was used as the theoretical framework since this model has previously been applied to several different public issues in an expansive context. Although the Issues Processes Model has not yet been tested on the issues of food waste, it does provide the guiding insight on the key factors involved in the issue process and their relationships.

To analyze the relationship between knowledge and involvement, basic information regarding levels of household knowledge and involvement were obtained to establish general ideas of households' status in relation to food waste prevention. This information provided sufficient predictions to an organization in understanding public background as knowledge is one of the factors that influence food behaviors along with social norms, attitudes, experience, and cultural upbringing (Ganglbauer et al., 2013). In addition, determining levels of involvement among households provide insights into opportunities for reducing food waste in the food supply and demand chain (Wharton et al., 2014). This study thus poses three basic research questions:

RQ1: What is the level of food waste prevention knowledge among Malaysians?

RQ2: What is the level of involvement with food waste prevention among Malaysians?

RQ3: What is the level of food waste prevention behavior among Malaysians?

Per the Issues Processes Model, the following research hypotheses were developed to examine (1) the relationship between food waste knowledge and food waste prevention behavior and (2) the relationship between food waste involvement and food waste prevention behavior.

H1: The level of food waste knowledge is positively correlated with the level of food waste prevention behavior.

H2: The level of food waste involvement is positively correlated with the level of food waste prevention behavior.

These hypotheses stipulate that food waste prevention behavior would be a function of the levels of food waste knowledge and involvement. To lend further credence to the Issues Processes Model which predicts the joint and interactive influence of knowledge and involvement on behavior, a third hypothesis was developed to determine if the predictive power of food waste knowledge would be enhanced by food waste involvement, and vice versa.

H3: There is an interaction between food waste knowledge and involvement in predicting food waste prevention behavior.

CHAPTER 4: METHODOLOGY

Sample and Research Design

The respondents were recruited through several platforms, mainly from individuals in the researcher's mobile phone's contact list, individuals that the researcher is connected to via Facebook, and finally through Malaysia Facebook's public group (*Masak Apa Hari Ini (MAHN)* and *Terbaik e-Store*). *Masak Apa Hari Ini (MAHN)* is an avenue through Malaysia Cooking Club for Malaysian households to share their culinary knowledge from past experiences. This group has a large membership (920,521 members as of August 25th, 2017) and is an active group. Another public group chosen in this study was *Terbaik e-Store* through the Facebook platform. This group is a business platform and is open to the public in order to promote and sell their products without any restrictions or payments (terbaikestore.com). Members in this group were approaching 354,568 as of August 25th, 2017.

Convenience sampling method was used in this study. This non-probability sampling technique aims to include all subjects in the study that are available at any given time (Babbie, 2001). The survey was conducted over a two-week period using the online survey tool, Qualtrics. The hosts of both online groups were contacted to get permission to post an announcement regarding this study. The survey included a description of the study, information about confidentiality, and a link to the questionnaire. The information collected from respondents were protected and remained confidential throughout the research process.

The study's participants consisted of 1,047 Malaysian households. Eight demographic questions were posed and Tables 2-8 represents the sample profile. A total of 901 respondents provided an answer for the gender question of which 608 (67.5%) were females and 293 were

males, with 146 choosing not to respond. Nine hundred respondents provide details of their race with the highest percentage (97.4%) being Malays, 0.9% are Chinese, and closely followed by Indians at (0.7%). Meanwhile, 67% respondents were married while 17.6% were single. Of the 1,047 respondents, 22.8% had a bachelor's degree, 37.8% had an associate degree, and the total percentage of respondents that had other levels of education was 28.4%. The highest percentage of income (28%) is in the less than RM30,000 category (~USD8,000), while only 5.6% had more than RM99,999 (~USD43,000) annual income. Most of the respondents lived in urban areas (48.8%) followed by suburban (26.3%).

Table 2: Distribution of Participant's Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	293	28.0	32.5	32.5
	Female	608	58.1	67.5	100.0
	Total	901	86.1	100.0	
Missing	System	146	13.9		
Total		1047	100.0		

Table 3: Distribution of Participant's Race

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Malay	877	83.8	97.4	97.4
	Chinese	8	0.8	0.9	98.3
	India	6	0.6	0.7	99.0
	Others	9	0.9	1.0	100.0
	Total	900	86.0	100.0	
Missing	System	147	14.0		
Total		1047	100.0		

Table 4: Distribution of Participant's Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single (never married)	184	17.6	20.4	20.4
	Married	701	67.0	77.8	98.2
	Separated	1	0.1	0.1	98.3
	Widowed	12	1.1	1.3	99.7
	Divorced	3	0.3	0.3	100.0
	Total	901	86.1	100.0	
Missing	System	146	13.9		
Total		1047	100.0		

Table 5: Distribution of Participant's Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than high school	2	0.2	0.2	0.2
	High school graduate	79	7.5	8.8	9.0
	Some college, no degree	112	10.7	12.5	21.5
	Associate's degree	396	37.8	44.1	65.6
	Bachelor's degree	239	22.8	26.6	92.2
	Graduate degree	70	6.7	7.8	100.0
	Total	898	85.8	100.0	
Missing	System	149	14.2		
Total		1047	100.0		

Table 6: Distribution of Participant's Household Income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than RM30,000	293	28.0	34.4	34.4
	RM30,000 to RM44,999	134	12.8	15.7	50.1
	RM 45,000 to RM69,999	188	18.0	22.1	72.2
	RM 69,000 to RM84,999	119	11.4	14.0	86.2
	RM 85,000 to RM99,999	59	5.6	6.9	93.1
	More than RM99,999	59	5.6	6.9	100.0
	Total	852	81.4	100.0	
Missing	System	195	18.6		
Total		1047	100.0		

Table 7: Distribution of Participant's No of People

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	39	3.7	4.4	4.4
	2	76	7.3	8.5	12.8
	3	104	9.9	11.6	24.5
	4	171	16.3	19.1	43.6
	5	184	17.6	20.6	64.1
	6 or more	321	30.7	35.9	100.0
	Total	895	85.5	100.0	
Missing	System	152	14.5		
Total		1047	100.0		

Mean = 4.51

Table 8: Distribution of Participant’s Area of Residence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Urban	511	48.8	56.8	56.8
	Suburban	275	26.3	30.6	87.3
	Rural	114	10.9	12.7	100.0
	Total	900	86.0	100.0	
Missing	System	147	14.0		
Total		1047	100.0		

Survey Instruments

The questionnaire comprised 21 questions which took approximately five minutes to answer. The first section of the survey questionnaire was a statement of confidentiality followed by the screening section to determine whether respondents were qualified to take part in the study based on certain characteristics. Individuals considered ineligible after answering these questions were eliminated from the survey. Survey participation was on a voluntary basis and respondents had the option to either choose not to answer specific questions or withdraw altogether. The questionnaire contained measures of self-reported knowledge of food waste, involvement in food waste, and food waste prevention behavior (shopping routines, household skills). Finally, the respondents were asked a series of demographic questions.

The variables involved in this study were food waste knowledge, involvement and food waste prevention behavior. Knowledge of food waste was measured by items evaluated through self-reporting particularly using: general knowledge of a respondent regarding the food waste issue. The variables were measured separately using three dimensions discussed earlier in this study which were: social/ethical, environmental, and economic and were assessed using nine items.

Knowledge of Food Waste Issue

Knowledge of food waste issues was examined using a preliminary question which was “To what extent do you feel knowledgeable in each of the following statements about food waste?” For the social/ethical and environmental dimension, six questions (Q1-Q6) were adapted from the Waste and Resources Action Programme (WRAP, 2007 & 2009) studies that annually provide data on food waste issues in the UK. These items examine issues particularly on global warming and world hunger. For the purpose of consistency, a 5-point scale ranging from not at all knowledgeable (1) to extremely knowledgeable (5) was used as a means for knowledge measurement. The remaining three questions (Q7-Q9) asked about the respondent’s knowledge of waste in Malaysia and were derived from the Malaysian studies conducted by Solid Waste and Public Cleansing Management Corporation (SWCorp), one of the reliable agencies that provide statistics on Malaysia food waste. Questions posted to respondents are listed below:

1. Food waste makes food less accessible for the poor and increases the number of hungry people in our society.
2. Hunger is the world’s number one health-risk and kills more people every year than AIDS, malaria, and tuberculosis combined.
3. Sixty-six million kids in the world go to school hungry every day and one in seven people in the world goes to bed hungry every night.
4. The high amount of food waste generated is the main cause of most issues related to landfills such as foul odors, toxic leachate, and vermin infestation.
5. Food waste is associated with large emissions of greenhouse gases and wasteful use of resources such as water, cropland, fertilizers, or fossil fuels.
6. Excess amounts of greenhouse gases such as methane, CO² and chlorofluorocarbons absorb infrared radiation and heat up the earth’s atmosphere, causing global warming and climate change.
7. Food waste represents a monetary loss and increases the cost of food.

8. Malaysians are throwing away up to 930 tons of unconsumed food daily and it costs a lot of money on water and energy used to grow and transport food.
9. Every year, an average Malaysian household wastes more than one month's salary on the food they don't eat

Involvement in Food Waste Issue

Food waste involvement measures were adapted from the personal involvement scale developed by Zaichkowsky (1985). Previous studies that have used Zaichkowsky's scale to measure involvement in health care services (Celuch & Taylor, 1999), financial services (Foxall & Pallister, 1998), and consumer behavior (Smith & Carsky, 1996). Respondents were asked about the extent to which they were personally concerned with the food waste issues used for measuring food waste knowledge. The nine questions were presented following the statement: **"To what extent are you personally concerned about the following statements of food waste?"** A 5-point Likert scale ranging from not at all concerned (1) to extremely concerned (5) was used.

Food Waste Prevention Behavior

Adapted from WRAP (2007) and Stefan et al. (2013), food waste prevention behavior was measured by self-reported behaviors pertaining to food shopping and preparation. The respondents were asked "To what extent do you agree or disagree with the following statements about your food shopping and preparation behavior?" This was followed by 11 questions on a 5-point Likert scale from not at all agree (1) to strongly agree (5).

1. I always make a shopping list when I buy food at grocery stores.
2. I always plan ahead for meals.
3. I always check cupboards and fridge before shopping for food.

4. I am able to buy exactly the right amount of food that my household needs.
5. I am able to cook and prepare exactly the appropriate amount of food that my household need
6. I often throw leftover food in the bin.
7. I frequently buy too much food.
8. I often cook too much food.
9. I always use the right portion sizes when preparing meals
10. I always keep food in proper storage conditions.
11. I often buy food in packages that are too big for my household's needs.

Scale Reliability

Scale reliability was calculated using Cronbach's Alpha (Cronbach, 1951), a popular reliability test in research. Tavakol (2011) stated that this test is "mandatory for assessors and researchers in order to add validity and accuracy to the interpretation of their data."

Table 9 to 11 present the Cronbach's alphas for food waste knowledge, involvement, and prevention behavior respectively. All alphas were greater than .80, indicating acceptable levels of internal consistency (Nunnally, 1978). Scale means were then calculated and used as composite measures of these variables in subsequent analyses.

Table 9: Reliability – Knowledge

Reliability Statistics	
Cronbach's Alpha	N of Items
.864	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Knowledge: Social/ethical				
Food waste makes food less accessible	19.25	38.406	.512	.858
Hunger is the world's number one health-risk	19.04	37.825	.545	.855
Sixty-six million kids in the world go to school in hunger	18.74	36.324	.635	.846
Knowledge: Environmental				
The high amount of food waste generated is the main cause	19.63	38.234	.601	.850
Food waste is associated with large emissions of greenhouse gases	19.02	36.444	.635	.846
Excess amounts of greenhouse gases	19.21	37.579	.537	.856
Knowledge: Economic				
A monetary loss increases the cost of food	19.69	38.321	.612	.849
Malaysians are throwing away up to 930 tons of food	19.19	36.393	.656	.844
Malaysian household throws away more than one month's salary worth of food	18.77	36.422	.630	.847

Table 10: Reliability – Involvement

Reliability Statistics

Cronbach's Alpha	N of Items
.938	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Involvement: Social/ethical				
Food waste is making food less accessible	15.23	41.739	.730	.932
Hunger is the world's number one health-risk	15.13	41.125	.753	.931
Sixty-six million kids in the world go to school hungry	15.23	40.785	.785	.929
Involvement: Environmental				
The high amount of food waste generated is the main cause	15.35	41.796	.753	.931
Food waste is associated with large emissions of greenhouse gases	15.11	41.050	.769	.930
Excess amounts of greenhouse gases are caused due to food waste	15.15	41.148	.750	.931
Involvement: Economic				
Food waste represents a monetary loss	15.38	41.784	.763	.930
Malaysians are throwing away up to 930 tons of food	15.22	41.116	.798	.928
Malaysian household throws away more than one month's salary worth of food	15.06	40.524	.767	.930

Table 11: Reliability – Behavior**Reliability Statistics**

Cronbach's Alpha	N of Items
.805	11

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I always make a shopping list when I buy food at grocery stores	22.99	30.055	.495	.787
I always plan ahead for meals.	22.73	29.613	.520	.784
I always check cupboards and fridge before shopping for food.	22.90	29.418	.562	.781
I am able to buy exactly the amount of food that my household needs.	22.42	28.519	.603	.775
I am able to cook and prepare exactly the amount of food that my household needs.	22.55	28.992	.584	.778
I often throw leftover food in the bin.	21.63	30.661	.252	.818
I frequently buy too much food.	22.50	28.600	.531	.782
I often cook too much food.	22.56	29.550	.455	.791
I always use the right portion sizes when preparing meals.	22.61	29.675	.587	.780
I always keep food in proper storage conditions.	22.72	30.790	.498	.788
I often buy food in packages that are too big for my household's needs.	22.01	31.628	.216	.818

CHAPTER 5: RESULTS

The purpose of this study is to obtain a descriptive overview of household's current level of food waste knowledge and involvement as well as to explore the relationships among knowledge, involvement, and food waste prevention behavior.

Preliminary Analysis

Table 12 to 14 present the descriptive statistics pertaining to food waste knowledge, involvement, and prevention behavior. Respondents' knowledge of the economic impact of food waste ranked the highest with a mean of 4.12, followed by knowledge of environmental (M = 4.06) and social/ethical impact (M = 3.68). Similarly, involvement with the economic consequences (M = 4.28) was the highest, followed by involvement with environmental (M = 4.24) and social/ethical consequences (M = 4.13). The most agreeable food waste prevention behavior appeared to be the preparation of a food shopping list (M = 4.22) and the least agreeable was throwing leftover food in the bin (M = 2.85).

Table 12: Knowledge – Descriptive Statistics

	N	Mean	Std. Deviation
Knowledge: Social/ethical			
Food waste makes food less accessible	1047	3.68	1.084
Hunger is the world's number one health-risk	1047	3.47	1.106
Sixty-six million kids in the world go to school in hunger	1047	3.17	1.147
Knowledge: Environmental			
The high amount of food waste generated is the main cause	1047	4.06	.981
Food waste is associated with high emissions of greenhouse gases	1046	3.45	1.136
Knowledge: Economic			
Excess amounts of greenhouse gases	1044	3.64	1.145
Is a monetary loss and increases the cost of food	1044	4.12	.951
Malaysians are throwing away up to 930 tons	1046	3.62	1.113
Malaysian household throws away more than one month's salary worth of food	1045	3.21	1.145
Valid N (listwise)	1039		

Table 13: Involvement – Descriptive Statistics

	N	Mean	Std. Deviation
Involvement: Social/ethical			
Food waste makes food less accessible	962	4.11	.967
Hunger is the world's number one health-risk	959	4.02	1.001
Sixty-six million kids in the world go to school in hunger	958	4.13	.998
Involvement: Environmental			
The high amount of food waste generated is the main cause	955	4.24	.933
Food waste is associated with high emissions of greenhouse gases	957	4.01	.987
Excess amounts of greenhouse gases	957	4.04	.999
Involvement: Economic			
Food waste represents a monetary loss	959	4.28	.923
Malaysians are throwing away up to 930 tons of food	961	4.12	.951
Malaysian household throws away more than one month's salary worth of food	958	3.96	1.042
Valid N (listwise)	942		

Table 14: Behavior – Descriptive Statistics

	N	Mean	Std. Deviation
I always make a shopping list when I buy food at grocery stores	705	4.22	.838
I always plan ahead for meals.	706	3.97	.871
I always check cupboards and fridge before shopping for food.	706	4.13	.848
I am able to buy exactly the right amount of food that my household needs.	705	3.66	.932
I am able to cook and prepare exactly the right amount of food that my household needs.	703	3.79	.896
I often throw leftover food in the bin.	701	2.85	1.182
I frequently buy too much food.	696	3.72	1.007
I often cook too much food.	698	3.78	.985
I always use the right portion sizes when preparing meals.	884	3.91	.788
I always keep food in proper storage conditions.	881	4.01	.735
I often buy food in packages that are too big for my household's needs.	883	3.15	1.067
Valid N (listwise)	670		

Hypotheses Testing

A series of multiple regressions tests were performed to test the research hypotheses. The regression model prescribed three sets of relationships: the relationship between knowledge and behavior (H1), the relationship between involvement and behavior (H2), and the relationship between the knowledge X involvement interaction term and behavior (H3). Knowledge, involvement, and the interaction terms of knowledge and involvement were treated as predictor (independent) variables while food waste prevention behavior was the criterion (dependent) variable. All these relationships, as indicated in earlier parts of the study, are stipulated in the Issues Processes Model. The regression model explained 10.2% of the total variance, which was deemed to be statistically significant ($F(3,655) = 24.697, p < .05$).

H1 states that the knowledge of food waste is positively correlated with food waste prevention behavior. Multiple regression results (Table 15) showed that the regression coefficient of food waste knowledge was positive and statistically significant ($\beta = .330, t = 3.538, p = .000$). That is, higher levels of knowledge were associated with higher levels of food waste prevention behavior. Hypothesis H1 was, thus, supported.

The second hypothesis (H2) states that the involvement with food waste is positively correlated with food waste prevention behavior. Results from the regression analysis supported the hypothesis ($\beta = .521, t = 3.221, p = .001$). Higher levels of involvement are associated with higher levels of food waste prevention behavior.

H3 states that there is an interaction between food waste knowledge and involvement in predicting food waste prevention behavior. Supporting the hypothesis, multiple regression results (Table 15) showed that the interaction was significant ($\beta = -.452, t = -2.101, p = .036$). Figure 2 shows in greater detail the nature of the knowledge X involvement interaction. Higher level of food waste involvement resulted in higher level of food waste prevention behavior,

regardless of the level of food waste knowledge. On the other hand, when the level of food waste involvement was low, higher level of food waste knowledge resulted in higher levels of food waste prevention behavior than lower level of food waste knowledge. In predicting food waste prevention behavior, food waste knowledge played a significant role when and only when food waste involvement was low.

Table 15: Regression analysis (H1, H2, & H3)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.369	.180		7.605	.000
KNOWLEDGE	.244	.069	.330	3.538	.000
INVOLVEMENT	.366	.114	.521	3.221	.001
KNOWLEDGE * INVOLVEMENT	-.081	.038	-.452	-2.101	.036

Dependent Variable: Behavior, R square = 1.02, p = .000

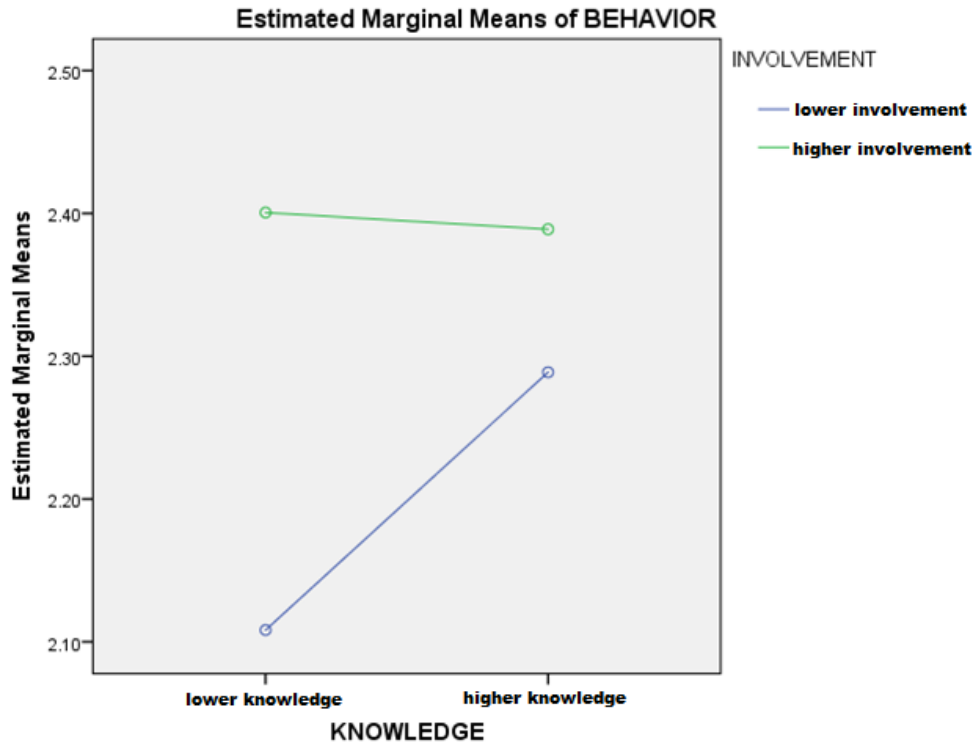


Figure 2: Estimated Marginal Means of Behavior

Additional Findings

The multiple regression results demonstrated that, while the relationship between knowledge and involvement in food waste prevention behavior were positively correlated, there was also a significant interaction between knowledge and involvement with food waste prevention behavior. To further elucidate these findings, additional data analyses were performed to determine whether knowledge, involvement, and behavior varied according to demographic variables.

Table 16 to 19 present the means and standard deviations of knowledge by gender and marital status. One way analysis of variance (ANOVA) revealed that male respondents ($M = 2.47$) had significantly higher food waste knowledge than female respondents ($M = 2.35$) ($F(1,896) = 5.57, p = .018$), and unmarried respondents ($M = 2.50$) showed a higher level of

food waste knowledge than married respondents ($M = 2.36$) ($F(1, 880) = 5.435, p = .02$). No other difference in knowledge was found between respondents in other demographic groups.

Table 16: Knowledge by Gender – Descriptive statistics

Dependent Variable: KNOWLEDGE

Gender	Mean	Std. Deviation	N
Male	2.4699	.72920	292
Female	2.3454	.74590	606
Total	2.3859	.74240	898

Table 17: Knowledge by Gender – ANOVA results

Tests of Between-Subjects Effects

Dependent Variable: KNOWLEDGE

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3.055 ^a	1	3.055	5.570	.018
Intercept	4569.189	1	4569.189	8332.323	.000
Gender	3.055	1	3.055	5.570	.018
Error	491.339	896	.548		
Total	5606.358	898			
Corrected Total	494.393	897			

a. R Squared = .006 (Adjusted R Squared = .005)

Table 18: Knowledge by Marital status – Descriptive statistics

Dependent Variable: KNOWLEDGE

Marital Status	Mean	Std. Deviation	N
Single (never married)	2.4982	.73931	184
Married	2.3558	.73655	698
Total	2.3855	.73898	882

Table 19: Knowledge by Marital status – ANOVA results

Tests of Between-Subjects Effects

Dependent Variable: KNOWLEDGE

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2.953 ^a	1	2.953	5.435	.020
Intercept	3430.823	1	3430.823	6314.126	.000
Marital Status	2.953	1	2.953	5.435	.020
Error	478.154	880	.543		
Total	5500.173	882			
Corrected Total	481.107	881			

a. R Squared = .006 (Adjusted R Squared = .005)

Tables 20 to 25 show the means and standard deviations of involvement by gender, marital status and family size. ANOVA results showed that males (M = 2.05) had a higher level of involvement than females (M = 1.81) ($F(1, 880) = 19.70, p=.000$); unmarried (Mean=1.98) more involved than married (M = 1.85) ($F(1, 863) = 4.01, p = .045$); and single-person families (M = 2.12) appeared to be the most involved with food waste ($F(5, 869) = 2.25, p = .047$).

Table 20: Involvement by Gender – Descriptive statistics

Dependent Variable: INVOLVEMENT

Gender	Mean	Std. Deviation	N
Male	2.0540	.84547	286
Female	1.8050	.74637	596
Total	1.8857	.78808	882

Table 21: Involvement by Gender – ANOVA results

Dependent Variable: INVOLVEMENT

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	11.983 ^a	1	11.983	19.703	.000
Intercept	2878.013	1	2878.013	4732.325	.000
Gender	11.983	1	11.983	19.703	.000
Error	535.181	880	.608		
Total	3683.568	882			
Corrected Total	547.164	881			

a. R Squared = .022 (Adjusted R Squared = .021)

Table 22: Involvement by Marital status – Descriptive statistics

Dependent Variable: INVOLVEMENT

Marital Status	Mean	Std. Deviation	N
Single (never married)	1.9889	.84122	180
Married	1.8571	.77015	685
Total	1.8845	.78679	865

Table 23: Involvement by Marital status – ANOVA results**Tests of Between-Subjects Effects**

Dependent Variable: INVOLVEMENT

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2.476 ^a	1	2.476	4.014	.045
Intercept	2108.445	1	2108.445	3417.889	.000
MaritalStatus	2.476	1	2.476	4.014	.045
Error	532.372	863	.617		
Total	3606.827	865			
Corrected Total	534.848	864			

a. R Squared = .005 (Adjusted R Squared = .003)

Table 24: Involvement of No of people – Descriptive statistics

Dependent Variable: INVOLVEMENT

No of People	Mean	Std. Deviation	N
1	2.1199	.79260	38
2	1.8844	.80826	74
3	1.8069	.72610	103
4	1.7882	.78244	170
5	2.0062	.78795	178
6 or more	1.8743	.79989	312
Total	1.8880	.78895	875

Table 25: Involvement of No of people – ANOVA results

Tests of Between-Subjects Effects

Dependent Variable: INVOLVEMENT

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	6.961 ^a	5	1.392	2.253	.047
Intercept	2051.397	1	2051.397	3319.359	.000
No People	6.961	5	1.392	2.253	.047
Error	537.051	869	.618		
Total	3662.988	875			
Corrected Total	544.012	874			

Tables 26 to 31 show the means and standard deviations of food prevention behavior by gender, marital status, and family size. Similar to involvement, ANOVA results showed that males ($M = 2.39$) reported a higher level of this type of behavior than females ($M = 2.19$) ($F(1, 665) = 21.26, p = .000$); unmarried ($M = 2.48$) higher than married ($M = 2.19$) ($F(1, 654) = 31.63, p = .000$); and single-person families ($M = 2.61$) exhibited the highest food waste prevention behavior of all ($F(5, 660) = 5.39, p = .000$).

Table 26: Behavior by Gender – Descriptive statistics

Dependent Variable: BEHAVIOR

Gender	Mean	Std. Deviation	N
Male	2.3925	.51898	205
Female	2.1867	.53717	462
Total	2.2500	.53968	667

Table 27: Behavior by Gender – ANOVA results

Tests of Between-Subjects Effects

Dependent Variable: BEHAVIOR

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	6.010 ^a	1	6.010	21.261	.000
Intercept	2977.481	1	2977.481	10533.882	.000
Gender	6.010	1	6.010	21.261	.000
Error	187.967	665	.283		
Total	3570.562	667			
Corrected Total	193.977	666			

a. R Squared = .031 (Adjusted R Squared = .030)

Table 28: Behavior by Marital status – Descriptive statistics

Dependent Variable: BEHAVIOR

Marital Status	Mean	Std. Deviation	N
Single (never married)	2.4774	.51983	139
Married	2.1931	.53166	517
Total	2.2533	.54142	656

Table 29: Behavior by Marital status – ANOVA results

Tests of Between-Subjects Effects

Dependent Variable: BEHAVIOR

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	8.858 ^a	1	8.858	31.633	.000
Intercept	2389.625	1	2389.625	8533.318	.000
Marital Status	8.858	1	8.858	31.633	.000
Error	183.143	654	.280		
Total	3522.826	656			
Corrected Total	192.001	655			

a. R Squared = .046 (Adjusted R Squared = .045)

Table 30: Behavior of No of person – Descriptive statistics

Dependent Variable: BEHAVIOR

No of People	Mean	Std. Deviation	N
1	2.6082	.53733	29
2	2.1941	.50488	59
3	2.1864	.51708	80
4	2.3090	.56900	138
5	2.3351	.49997	134
6 or more	2.1577	.53588	226
Total	2.2510	.53986	666

Table 31: Behavior of No of person – ANOVA results

Tests of Between-Subjects Effects

Dependent Variable: BEHAVIOR

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	7.604 ^a	5	1.521	5.391	.000
Intercept	2289.467	1	2289.467	8114.935	.000
NoPeople	7.604	5	1.521	5.391	.000
Error	186.206	660	.282		
Total	3568.504	666			
Corrected Total	193.810	665			

CHAPTER 6: DISCUSSION

Food waste is becoming an imperative issue for global communities and is categorized as “a global problem of enormous economic, environmental and societal significance”. Research has been developed to acquire useful input regarding food waste from different perspectives. In this study, the researchers attempt to shed light on the relationships between knowledge, involvement, and household food waste prevention behavior. The results highlight the potential importance of knowledge and involvement in creating a positive side to food waste behavior, which ultimately leads to a reducing in the amount of food waste in Malaysia. Hallahan’s Issues Processes Model was applied in the study to determine the food waste prevention behavior levels of the participants, along with the application of their knowledge procurement and involvement levels of three types of food waste consequences.

Overall Food Waste Prevention

Information regarding a household’s knowledge, level of involvement, and food waste behavior were obtained in this study to procure an overall idea about where Malaysian households stand regarding food waste issues. This in return provided a basic guideline for organizations to predict the relationship between these variables and the information obtained could possibly be a benchmark to create an effective food waste awareness campaign. Three aspects of negative consequences for food waste were applied in this research, notably; social/ethical, environmental, and economic. The findings show that knowledge of economic issues ranked highest with a mean of 4.12, followed by knowledge of the environmental issues (M = 4.06) and finally knowledge of social/ethical issues (3.68). Similarly, the results for involvement of economic issues was highest (M = 4.28), followed by involvement of

environmental concern ($M = 4.24$) and, lastly, involvement of social/ethical issues ($M = 4.13$). As for the behavior aspect, making a shopping list when they buy food items at a grocery store is a strong distinctive method of recognized as a method of preventing food waste ($M = 4.22$).

Interpretation of the results have indicated that the type of country is a decisive factor explaining the trend in food wastage. Malaysia is considered a developing country and, thus, public reports being more concerned about the financial aspect of food wastage. This is due to the fact that economic consequences directly affect one's monthly expenses. However, when it comes to the environmental concerns, the situation is very much subjective and does not affect the individual directly. As such, present findings seem to be consistent with other research, which reported that consumers are more concerned about financial consequences than environmental consequences of food waste (Parizeau et al., 2015).

Nevertheless, from a behavioral perspective, making a shopping list was chosen as a priority action that can be taken to avoid food waste in this current study. It is in line with a quote from the Head Secretariat of Save Food Malaysia regarding the ways to reduce food waste by stating "It all starts with planning, if you plan your shopping well, you can reduce food waste" (Al Bakri, 2016). This is a good sign since the majority of food waste occurs at home. Planning one's shopping effectively is the first approach to preventing food waste because the home is a starting point for the younger generation to obtain life altering lessons from the elders.

Overall Relationship of Food Waste Prevention

Knowledge and involvement have been established as important factors that could alter an individual's behavior in preventing food waste. The results support such a relationship between these variables by proving that knowledge regarding household food waste has a significant correlation with food waste prevention behavior ($\beta = .330$, $t = 3.538$, $p = .000$). As

such, the results indicate that, those with lower levels of knowledge tend to ignore or rather take less action in preventing food waste daily, and vice versa. The findings are consistent with those of Cannali (2014) who found that the lack of knowledge had been identified as one of the factors that commonly influence consumer's behavior towards the food waste problem. Hence, knowledge about the factors driving of food waste in Malaysian households must be increased using public communication campaigns.

On another note, this study displays that there is a positive correlation between the involvements of household food waste to food waste prevention behavior ($\beta = .521$, $t = 3.221$, $p = .001$). It demonstrates that individuals who minimizes food waste are the ones with high involvement levels in the food waste issue. Although the basic systemic action comes from a nation's leadership, individual involvement beginning with each house acts as a catalyst to reduce waste. This finding corroborates with the ideas of Vermeir (2006), who suggested, "When people are more involved, they are more willing to tackle the food waste issue." Further supporting that notion was a WRAP (2008) study, which mentioned that households found engaging in any food waste activities such as recycling, composting, and sorting waste, waste less food than others.

A crucial finding in this research was the interaction between knowledge and involvement in food waste prevention behavior which showed significance ($\beta = -.452$, $t = -2.101$, $p = .036$). In other words, level of knowledge has a positive impact on food waste behavior only if the involvement is high and vice versa. As such, the estimated marginal means were analyzed to visualize this finding. Knowledge and involvement give different interpretations of behavior. From the point of view of knowledge, an individual who has a lower involvement may alter their behavior to have a more positive approach if they possess higher levels of knowledge. However, the trend is different for involvement. For individuals who have a higher involvement level, prevention of food waste occurs consistently, regardless

of their knowledge level. Involvement seems to be a more important factor in tackling food waste issues than knowledge about reducing household's food wastage. This information again, can act as a guideline for organizations to strategize plans in enhancing the awareness campaigns focusing on public involvement.

The present study also revealed certain additional findings regarding the roles of socio-demographic variables. Firstly, it was expected that females would be more responsive to the issue and reduce their food waste. However, this finding does not support the notion. It is surprising to note that males had significantly more knowledge and involvement than women in this study. This is probably because women spend more time trying to manage their families along with their own life restricting their abilities to be concerned with global problems such as food waste. Nevertheless, a study done by Vercillo (2016) in Ghana showed that most women are responsible for food across the supply chain from field, processing, cooking, and distribution in diverse ways. Sauer et al. (2004) further supported this notion in a study where he concluded that there was no significant difference between females and males in food wasted. Based on those findings, gender differences in the food waste issue is considered a subjective matter since women and men from different geographical locations (developed or developing) have different experiences, knowledge, challenges and needs in relation to food.

Another component in the socio-demographic element that shows interesting findings are marital status and number of persons in the family. As for knowledge and involvement is concerned, people who are still single ($M = 1.98$) are more knowledgeable and have a high involvement level compared to married persons. This result may be explained by the fact that single consumers have more time to devote themselves to food waste issues and so become more adept in avoiding food waste. A single person is very independent and must learn efficient ways in handling his/her own food. They need to be responsible for the food they buy and this might encourage them to gain extra knowledge in attempting to prevent food waste. A

possibility that can be proposed for the above predicament was that since singles might be planning toward marriage they might need to be more prudent in savings.

Implications

There are several theoretical implications present in this study. Knowledge was shown to have a significant positive relationship to food waste prevention behaviors. The higher the knowledge level regarding the three types of food waste consequences (social/ethical, environmental, and economic), the higher the perceived levels of individual food waste prevention behavior. This finding is consistent with Hallahan's Issues Processes Model which specifies a positive relationship between stakeholder knowledge and activism. Although this does not display the literal level of behavior changes, it indicates that individuals rate themselves on a higher level as their knowledge increases. Hence, knowledge from the perspective of food waste management's view could possibly indicate higher levels of confidence in an individual's ability to prevent waste, not necessarily associated with the person's actual behavior. This concept was similar to the involvement in food waste.

Involvement was also shown to have a significant positive relationship to food waste prevention behavior. These findings further support the Hallahan's (2000) model whereby it was mentioned that the public pays attention to issues, relationships, or organizations if they can visualize the gap in their expectations. Therefore, it is normal for individuals to be considered active only on particular issues. Further, food waste organizations need to implement sustainable food waste programs that can be accessed by households in the local community who wish to participate.

Public are categorized differently based how they are organized to discuss issues or problems. Once the public recognizes a problem, they are easily aroused and moved into the active public stage whereby involvement increases (Hallahan, 2001). Malaysian households fall into the role of active audience because of beliefs that food waste prevention is personally

relevant and recognize the consequences, especially economic consequences, that might occur such as an increased price in food. These results are consistent with Grunig's theory that an active public will keenly look for information and react to that information. Grunig's Situational Theory categorizes active public as persons with a problem-facing behavior with high problem recognition and also low constraint recognition (Grunig, 1992). In common, these individuals are the leaders on a particular topic. This is an important direction since Atkin & Salmon (2010) suggest that disseminating messages to potential interpersonal influencers/opinion leaders is one of the effective strategies to use in a communication campaign.

This present study likewise highlights many practical implications. The outcome of the study may contribute toward enhancing consumer's knowledge, involvement, and behavior by providing general information such as recommendations that formulate strategies for addressing an effective food waste campaign. Effective public communication campaigns regularly concentrate on a particular waste stream and then offer functional, simple to follow guidelines on waste prevention activities. The main obstacle for people in taking action to reduce their food waste, or effectively participate in such activities, is due to a complete lack of food waste awareness (WRAP, 2013), and they are known to have a low understanding of the issue. Hence, these current findings can increase both participation and commitment to prevention activities by individuals. An organization that is directly involved in food waste management will be better equipped, as knowledge of the population segment was dissected in order to design effective media campaigns.

Although the Malaysian government has actively been involved in organizing food waste campaigns over the past two years, effective communication only materializes when the government can build a positive relationship with the public by enhancing their attention span and increasing engagements. Nevertheless, both involvement and knowledge are two crucial

aspects in any issue. However, these findings show that an individual's involvement was slightly more important compared to the individual's knowledge. The onus is on the government to create an effective awareness campaign together with educational programs and content in which a household could potentially acquire good prevention behavior techniques as it will elevate the positive attitude of Malaysian households toward food waste issues.

Limitations of The Study

As with any research, this study also had limitations that may have affected results. First, the households that participated may not represent the average population. The level of knowledge and involvement of household was assessed using a convenient (snowball) sample rather than a random sample. In this design, the chance to participate is not equal for all qualified person within the target population, thus the results may not be generalizable to this population (Suen, 2014). The element of bias, great or small, is always there when using this type of sampling and sampling error cannot be estimated. Still, convenient sampling was adopted since it provides inherent advantages to time and money management.

Secondly, the scale measuring food waste behavior contained self-reported items that could be biased estimates of true behavior. These types of questionnaires mostly rely on the honesty of the respondents. They might have reported higher value for every variable than the actual fact, as this involves the strongly moral issue of food wastage. However, they should not have felt any pressure to report lower achievement of knowledge and involvement since the respondents were informed that the data would be anonymous and strictly confidential. This is supported by Hoskin (2012) who discussed several potential problems with self-report measures including honesty/image management, introspective ability, response bias, and ordinal measures

CHAPTER 7: CONCLUSION

The findings in this research ascertained the different levels of knowledge and involvement among Malaysian households as a fundamental tool for organizations in understanding public opinions toward the issue of food waste. As such, one of the most crucial aspects in food waste prevention is the relation between knowledge and involvement toward the subject matter. Hallahan (2000) mentioned these two aspects as an important factor in “learning, information processing and persuasion” (p. 507). This study also reaffirmed that knowledge and involvement levels need constant fundamental interactions in order to obtain positive impacts on food waste prevention behaviors. Thus, the onus is on organizations to disseminate vital information regarding food waste activities and in making people aware of this issue which will elevate a person’s behavior towards the subject matter.

The hypotheses developed at the initial stage of this research managed to conclude that the majority of households are in an active state based on the significant interaction between the knowledge and involvement in food waste prevention behaviors. By all odds, this provides valuable information to help an organization to create an effective food waste awareness campaign. A certain number of organizations in Malaysia have been actively organizing many food waste campaigns over the past two years. Nonetheless, procuring vital information regarding the level of knowledge, involvement of households and an individual’s demographic background could lend a helping hand to organizations in creating strategic options to enhance public approaches toward this matter. These approaches could focus on people with different backgrounds and personalities. This further lends credence to the Hallahan Issue Processes Model (2001) which suggests strategies that are effective with an active public might not be

suitable in dealing with lower levels of knowledge and for lower involvement groups. As such, organizations are better off using several strategies to tackle this issue.

Interestingly, an individual with a higher level of involvement adopts a more positive behavioral approach toward such matters regardless of the knowledge level possessed. Hence, optimizing the level of public involvement provides a positive impact in reducing food waste. The results obtained support the approach of targeting household routines such as making a shopping list before purchasing. Such routines could be further positively impacted by providing proposals on how to deal with food-related activities such as providing booklets or cooking courses (Stancu et al., 2016). This is in line with observations by Sharp, Giorgi & Wilson (2010) who proposed that it is important to enable, engage and encourage the public by using appropriate campaigns to alter an individual's behavior. The demographic findings in this study revealed that men and singles have better knowledge and involvement levels. It also provides valuable information for organizations which in return would provide an opportunity to create superior processing messages. Such information is vital in helping to guide the manner in which a message is processed.

Findings from this study have essential implications for developing new approaches for an effective awareness campaign. Communicating with the active public category impose less challenges to organizations. This group is easy to collaborate with and is likely to be organized by leaders and formal structures. Several organizational response strategies have been recommended by Hallahan (2000) which include: "alter organization policies, negotiate, and bargain with leaders and provide support and nurture" (pg. 27). It is highly possible to implement these in Malaysia through organizations toward creating an effective campaign. As such, implementing such strategies will certainly benefit Malaysian organizations by reducing cost, time, and energy in their campaign processes, as they could identify knowledge and involvement groups more effectively and efficiently.

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APPENDICES

Appendix 1. Survey Questionnaires (English version)

Informed consent

Dear Sir/Madam,

I am an MA student from the University of South Florida. As part of the study for Master of Art, it is mandatory for the student to do a research project. The title of this research is “Household Food Waste Prevention in Malaysia: An Issue Processes Model Perspective”. The purpose of my study is to identify the current knowledge level and involvement of Malaysians on food waste prevention and furthermore examine the relationships among knowledge, involvement, and household food waste prevention behaviors.

It would be very much appreciated if you could spend a few minutes to complete this questionnaire. There are no right or wrong answers, and your honest feedback is critical to the accomplishment of this study. Please be assured that all your information provided will be kept confidential.

If there are any queries regarding to the questionnaire, please do not hesitate to contact the researcher, and further clarification will be given as requested. Your support and cooperation are most appreciated. Thank you very much for your time and assistance

Syahirah Abd Razak

syahirahbint@mail.usf.edu

+18138501261

Confidentiality statement:

The purpose of this research is to obtain participants' views about their state of food waste prevention behavior. Your participation in this survey is entirely voluntary. No identifying information will be collected and your responses will be kept confidential. No identifying information will be associated with your responses or included in any reports.

Please choose yes below to continue onto the survey. Thank you for your cooperation and time.

- Yes. I understand the confidentiality statement and choose to continue onto the surveys.
- No, I choose not to continue onto the surveys and understand I will now be rejected from this survey.

1. Which of the following best applies to you?

- I never do any food shopping (1)
- I sometimes do the food shopping (2)
- I do most of the food shopping (3)
- I do all the food shopping (4)

2. Do you do any of the food preparation at home?

- No, I never prepare any food (1)
- Yes, sometimes (2)
- Yes, it's usually me (3)
- Yes, it's always me (4)

(If answer (3) or (4) to either Q1 or Q2 or both Q1 and Q2, continue the survey. If not, thank and close.)

WE'D LIKE TO ASK YOU SOME QUESTIONS ABOUT FOOD WASTE. PLEASE ANSWER THE QUESTIONS CAREFULLY AND BE AS NONEST AS YOU CAN. THIS IS NOT A TEST AND THERE ARE NO RIGHT OR WRONG ANSWERS. SIMPLY GIVE YOUR ANSWERS AS YOU FEEL RIGHT NOW.

TO WHAT EXTENT DO YOU FEEL KNOWLEDGEABLE IN EACH OF THE FOLLOWING STATEMENTS ABOUT FOOD WASTE?

3. Food waste making food less accessible for the poorest and increasing the number of hungry people in our society.

- Not at all knowledgeable
- Slightly knowledgeable
- Somewhat knowledgeable
- Moderately knowledgeable
- Extremely knowledgeable

4. Hunger is the world's number one health-risk and kills more people every year than AIDS, malaria, and tuberculosis combined.

- Not at all knowledgeable
- Slightly knowledgeable
- Somewhat knowledgeable
- Moderately knowledgeable

Extremely knowledgeable

5. Sixty-six million kids in the world go to school hungry every day and one in seven people in the world goes to bed hungry every night.

- Not at all knowledgeable
- Slightly knowledgeable
- Somewhat knowledgeable
- Moderately knowledgeable
- Extremely knowledgeable

6. The high amount of food waste generated is the main cause of most issues related to landfills such as foul odors, toxic leachate, and vermin infestation.

- Not at all knowledgeable
- Slightly knowledgeable
- Somewhat knowledgeable
- Moderately knowledgeable
- Extremely knowledgeable

7. Food waste is associated with large emissions of greenhouse gases and wasteful use of resources such as water, cropland, fertilizers, or fossil fuels.

- Not at all knowledgeable
- Slightly knowledgeable
- Somewhat knowledgeable
- Moderately knowledgeable
- Extremely knowledgeable

8. Excess amounts of greenhouse gases such as methane, CO² and chlorofluorocarbons absorb infrared radiation and heat up the earth's atmosphere, causing global warming and climate change.

- Not at all knowledgeable
- Slightly knowledgeable
- Somewhat knowledgeable
- Moderately knowledgeable
- Extremely knowledgeable

9. Food waste represents a monetary loss and increases the cost of food.

- Not at all knowledgeable
- Slightly knowledgeable
- Somewhat knowledgeable
- Moderately knowledgeable
- Extremely knowledgeable

10. Malaysians are throwing away up to 930 tons of unconsumed food daily and it cost a lot of money for water and energy used to grow and transport food.

- Not at all knowledgeable
- Slightly knowledgeable
- Somewhat knowledgeable
- Moderately knowledgeable
- Extremely knowledgeable

11. Every year, an average Malaysian household throws away more than one month's salary on the food they don't eat

- Not at all knowledgeable
- Slightly knowledgeable
- Somewhat knowledgeable
- Moderately knowledgeable
- Extremely knowledgeable

TO WHAT EXTENT ARE YOU PERSONALLY CONCERNED ABOUT THE FOLLOWING STATEMENTS OF FOOD WASTE?

12. Food waste making food less accessible for the poorest and increasing the number of hungry people in our society.

- Not at all concerned
- Slightly concerned
- Somewhat concerned
- Moderately concerned
- Extremely concerned

13. Hunger is the world's number one health-risk and kills more people every year than AIDS, malaria, and tuberculosis combined.

- Not at all concerned
- Slightly concerned
- Somewhat concerned
- Moderately concerned
- Extremely concerned

14. Sixty-six million kids in the world go to school hungry every day and one in seven people in the world goes to bed hungry every night.

- Not at all concerned
- Slightly concerned
- Somewhat concerned
- Moderately concerned
- Extremely concerned

15. The high amount of food waste generated is the main cause of most issues related to landfills such as foul odors, toxic leachate, and vermin infestation.

- Not at all concerned
- Slightly concerned
- Somewhat concerned
- Moderately concerned
- Extremely concerned

16. Food waste is associated with large emissions of greenhouse gases and wasteful use of resources such as water, cropland, fertilizers, or fossil fuels.

- Not at all concerned
- Slightly concerned
- Somewhat concerned

- Moderately concerned
- Extremely concerned

17. Excess amounts of greenhouse gases such as methane, CO² and chlorofluorocarbons absorb infrared radiation and heat up the earth's atmosphere, causing global warming and climate change.

- Not at all concerned
- Slightly concerned
- Somewhat concerned
- Moderately concerned
- Extremely concerned

18. Food waste represents a monetary loss and increases the cost of food.

- Not at all concerned
- Slightly concerned
- Somewhat concerned
- Moderately concerned
- Extremely concerned

19. Malaysians are throwing away up to 930 tons of unconsumed food daily and it cost a lot of money for water and energy used to grow and transport food.

- Not at all concerned
- Slightly concerned
- Somewhat concerned
- Moderately concerned
- Extremely concerned

20. Every year, an average Malaysian household throws away more than one month's salary on the food they don't eat.

- Not at all concerned
- Slightly concerned
- Somewhat concerned
- Moderately concerned
- Extremely concerned

21. In the past 2 years, I have

- Attended a meeting on how to prevent of food waste
- Attended food waste training
- Attended any food waste awareness program
- None of the above

22. Do you aware of MySaveFood campaign?

- Yes
- No

TO WHAT EXTENT DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS ABOUT YOUR FOOD SHOPPING AND PREPARATION BEHAVIOR?

23 (a). I always make a shopping list when I buy food at grocery stores.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

(b). I always plan ahead for the meals.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

(c). I always check cupboards and fridge before shopping for food.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

(d). I am able to buy exactly the amount of food that my household needs.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

(e). I am able to cook and prepare exactly the amount of food that my household needs.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

(f). I often throw leftover food in the bin.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

(g). I frequently buy too much food.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

(h). I often cook too much food.

- Strongly disagree

- Disagree
- Neutral
- Agree
- Strongly agree

(i). I always use the right portion sizes when preparing meals.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

(j). I always keep food in proper storage conditions.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

(k). I often buy food in packages that are too big for my household's needs.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

(l). To me, food products may pose a health risk if they are used after the "use by" date on the labels.

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

(m). To me, food products may pose a health risk if they are used after the "best before" date on the labels.

- Strongly agree (5)
- Agree (4)
- Neutral (3)
- Disagree (2)
- Strongly disagree (1)

FINALLY, A FEW QUESTIONS ABOUT YOUR BACKGROUND.

25. Your gender is:

- Male (1)
- Female (2)

26. Race

- Malay (1)
- Chinese (2)
- India (3)
- Others (4)

27. Your marital status is:

- Single (never married) (1)
- Married (2)
- Separated (3)
- Widowed (4)
- Divorced (5)

28. What is your age, please?

- 17-21
- 22-26
- 27-31
- 32-36
- 37-41
- 42-46
- 47-51
- 52-56
- 57-61
- 62 and above

29. What is the highest level of education that you have completed?

- Less than high school (1)
- High school graduate (2)
- Some college, no degree (3)
- Associate's degree (4)
- Bachelor's degree (5)
- Ph.D. (6)

30. Are you currently not working, working part-time, or working full-time?

- Not working (1)
- Working part-time (2)
- Working full-time (3)

31. What was your total household income before taxes during the past 12 months?

- Less than RM30,000 (1)
- RM30,000 to RM44,999 (2)
- RM 45,000 to RM69,999 (3)
- RM 69,000 to RM84,999 (4)
- RM 85,000 to RM99,999 (5)
- RM 100,000 or more (6)

32. How many people live in your household (including yourself)?

- One
- Two
- Three

- Four
- Five
- Six or more

33. How many children do you have?

- One
- Two
- Three
- Four
- Five
- Six or more
- Other

34. Your area of residence is:

- Urban area (1)
- Suburban area (2)
- Rural area (3)

Appendix 2. Survey questionnaire (Malay version)

1. Sila tandakan ruangan yang berkenaan.

- Saya tidak pernah membeli-belah bahan makanan (1)
- Saya jarang membeli-belah bahan makanan (2)
- Saya sering membeli-belah bahan makanan (3)
- Saya sentiasa membeli-belah bahan makanan (4)

2. Adakah anda pernah menyediakan makanan di rumah?

- Tidak, saya tidak pernah menyediakan makanan (1)
- Ya, kadang kala (2)
- Ya, sering kali (3)
- Ya, setiap masa (4)

Jika jawapan anda adalah pada skala (3) atau (4) bagi salah satu daripada soalan Q1 atau Q2, atau kedua-duanya (Q1 & Q2), sila terus dengan soal berikutnya. Jika tidak, terima kasih.

Soal selidik ini adalah berkaitan dengan pembaziran makanan. Sila jawab semua soalan dengan teliti dan sejujurnya. Memandangkan ini bukanlah ujian, maka tiada jawapan yang salah atau betul. Pastikan jawapan yang diberi melambangkan diri anda sendiri bagi memastikan objektif kajian ini berkesan.

Sejauh mana anda berpengetahuan dalam setiap pernyataan berkenaan pembaziran makanan di bawah?

3. Pembaziran makanan menyebabkan golongan miskin sukar memperoleh makanan kerana harga makanan yang semakin meningkat dan ini menyumbang kepada kenaikan jumlah golongan kelaparan di dalam masyarakat kita.

- Tidak berpengetahuan
- Kurang berpengetahuan
- Agak berpengetahuan
- Sederhana berpengetahuan
- Sangat berpengetahuan

4. Kelaparan merupakan risiko kesihatan nombor pertama dunia dan telah membunuh ramai orang setiap tahun berbanding dengan penyakit AIDS, malaria, dan tuberculosis.

- Tidak berpengetahuan
- Kurang berpengetahuan
- Agak berpengetahuan
- Sederhana berpengetahuan
- Sangat berpengetahuan

5. Setiap hari, enam puluh enam juta kanak-kanak di dunia pergi ke sekolah kelaparan dan satu daripada tujuh orang di dunia tidur dalam kelaparan setiap malam.

- Tidak berpengetahuan
- Kurang berpengetahuan

- Agak berpengetahuan
- Sederhana berpengetahuan
- Sangat berpengetahuan

6. Jumlah sisa makanan yang tinggi menjadi punca utama kebanyakan isu berkaitan dengan tapak pelupusan seperti bau busuk, larutan toksik, dan serangan kutu.

- Tidak berpengetahuan
- Kurang berpengetahuan
- Agak berpengetahuan
- Sederhana berpengetahuan
- Sangat berpengetahuan

7. Pembaziran makanan dikaitkan dengan pelepasan gas rumah hijau dan pembaziran penggunaan sumber seperti air, tanah pertanian, baja, atau bahan api fosil.

- Tidak berpengetahuan
- Kurang berpengetahuan
- Agak berpengetahuan
- Sederhana berpengetahuan
- Sangat berpengetahuan

8. Jumlah gas rumah hijau yang berlebihan seperti metana, CO² dan klorofluorokarbon menyerap radiasi inframerah dan memanaskan atmosfera bumi menyebabkan terjadinya pemanasan global dan perubahan iklim.

- Tidak berpengetahuan
- Kurang berpengetahuan
- Agak berpengetahuan
- Sederhana berpengetahuan
- Sangat berpengetahuan

9. Pembaziran makanan melambangkan kerugian dari sudut kewangan dan sekaligus meningkatkan kos makanan

- Tidak berpengetahuan
- Kurang berpengetahuan
- Agak berpengetahuan
- Sederhana berpengetahuan
- Sangat berpengetahuan

10. Rakyat Malaysia membuang sehingga 930 tan makanan yang belum dimakan setiap hari dan ini menyebabkan peningkatan jumlah kos bagi air dan tenaga yang digunakan untuk menanam dan mengangkut makanan.

- Tidak berpengetahuan
- Kurang berpengetahuan
- Agak berpengetahuan
- Sederhana berpengetahuan
- Sangat berpengetahuan

11. Setiap tahun, purata isi rumah tangga Malaysia yang membuang makanan yang belum dimakan dianggarkan melebihi daripada satu bulan gaji pendapatan.

- Tidak berpengetahuan
- Kurang berpengetahuan
- Agak berpengetahuan
- Sederhana berpengetahuan
- Sangat berpengetahuan

Sejauh manakah anda secara peribadi mengambil berat/prihatin tentang pernyataan di bawah?

12. Pembaziran makanan menyebabkan golongan miskin sukar memperoleh makanan kerana harga makanan yang semakin meningkat dan ini menyumbang kepada kenaikan jumlah golongan kelaparan di dalam masyarakat kita.

- Tidak prihatin
- Kurang prihatin
- Agak prihatin
- Sederhana prihatin
- Sangat prihatin

13. Kelaparan merupakan risiko kesihatan nombor pertama dunia dan telah membunuh ramai orang setiap tahun berbanding dengan penyakit AIDS, malaria, dan tuberculosis.

- Tidak prihatin
- Kurang prihatin
- Agak prihatin
- Sederhana prihatin
- Sangat prihatin

14. Setiap hari, enam puluh enam juta kanak-kanak di dunia pergi ke sekolah kelaparan dan satu daripada tujuh orang di dunia tidur dalam kelaparan setiap malam.

- Tidak prihatin
- Kurang prihatin
- Agak prihatin
- Sederhana prihatin
- Sangat prihatin

15. Jumlah sisa makanan yang tinggi menjadi punca utama kebanyakan isu berkaitan dengan tapak pelupusan seperti bau busuk, larutan toksik, dan serangan kutu.

- Tidak prihatin
- Kurang prihatin
- Agak prihatin
- Sederhana prihatin
- Sangat prihatin

16. Pembaziran makanan dikaitkan dengan pelepasan gas rumah hijau dan pembaziran penggunaan sumber seperti air, tanah pertanian, baja, atau bahan api fosil.

- Tidak prihatin
- Kurang prihatin
- Agak prihatin
- Sederhana prihatin
- Sangat prihatin

17. Jumlah gas rumah hijau yang berlebihan seperti metana, CO² dan klorofluorokarbon menyerap radiasi inframerah dan memanaskan atmosfera bumi menyebabkan terjadinya pemanasan global dan perubahan iklim.

- Tidak prihatin
- Kurang prihatin
- Agak prihatin
- Sederhana prihatin
- Sangat prihatin

18. Pembaziran makanan melambangkan kerugian dari sudut kewangan dan sekaligus meningkatkan kos makanan

- Tidak prihatin
- Kurang prihatin
- Agak prihatin
- Sederhana prihatin
- Sangat prihatin

19. Rakyat Malaysia membuang sehingga 930 tan makanan yang belum dimakan setiap hari dan ini menyebabkan peningkatan jumlah kos bagi air dan tenaga yang digunakan untuk menanam dan mengangkut makanan.

- Tidak prihatin
- Kurang prihatin
- Agak prihatin
- Sederhana prihatin
- Sangat prihatin

20. Setiap tahun, purata isi rumah tangga Malaysia yang membuang makanan yang belum dimakan dianggarkan melebihi daripada satu bulan gaji pendapatan.

- Tidak prihatin
- Kurang prihatin
- Agak prihatin
- Sederhana prihatin
- Sangat prihatin

Sejauh manakah anda bersetuju atau tidak bersetuju dengan kenyataan berikut yang berkaitan dengan tingkah laku semasa membeli keperluan makanan dan semasa penyediaan makanan.

21. Saya sentiasa membuat senarai membeli-belah apabila saya membeli makanan di pasar raya.

- Sangat tidak setuju
- Tidak setuju
- Neutral
- Setuju
- Sangat setuju

22. Saya sentiasa merancang untuk menu makanan akan datang.

- Sangat tidak setuju
- Tidak setuju
- Neutral

- Setuju
- Sangat setuju

23. Saya sentiasa memeriksa almari dan peti sejuk sebelum membeli barang keperluan makanan

- Sangat tidak setuju
- Tidak setuju
- Neutral
- Setuju
- Sangat setuju

24. Saya dapat membeli dengan tepat jumlah makanan yang diperlukan oleh isi rumah saya.

- Sangat tidak setuju
- Tidak setuju
- Neutral
- Setuju
- Sangat setuju

25. Saya dapat memasak dan menyediakan jumlah makanan yang tepat yang diperlukan oleh isi rumah saya.

- Sangat tidak setuju
- Tidak setuju
- Neutral
- Setuju
- Sangat setuju

26. Saya sering membuang sisa makanan di dalam tong sampah.

- Sangat tidak setuju
- Tidak setuju
- Neutral
- Setuju
- Sangat setuju

27. Saya sering membeli terlalu banyak makanan.

- Sangat tidak setuju
- Tidak setuju
- Neutral
- Setuju
- Sangat setuju

28. Saya selalu masak dengan kuantiti yang banyak.

- Sangat tidak setuju
- Tidak setuju
- Neutral
- Setuju
- Sangat setuju

29. Saya sentiasa menggunakan saiz bahagian yang betul semasa menyediakan makanan.

- Sangat tidak setuju
- Tidak setuju
- Neutral
- Setuju
- Sangat setuju

30. Saya sentiasa menyimpan makanan menggunakan kaedah penyimpanan yang betul.

- Sangat tidak setuju
- Tidak setuju
- Neutral
- Setuju
- Sangat setuju

31. Saya sering membeli makanan dalam kuantiti yang besar untuk keperluan isi rumah saya.

- Sangat tidak setuju
- Tidak setuju
- Neutral
- Setuju
- Sangat setuju

32. Bagi saya, produk makanan mungkin menimbulkan risiko kesihatan jika ia digunakan selepas tarikh "guna sebelum" pada label.

- Sangat tidak setuju
- Tidak setuju
- Neutral
- Setuju
- Sangat setuju

33. Bagi saya, produk makanan mungkin menimbulkan risiko kesihatan jika ia digunakan selepas tarikh "baik sebelum" pada label.

34. Jantina:

- Lelaki
- Perempuan

35. Status perkahwinan

- Bujang
- Berkahwin
- Berpisah
- Janda
- Cerai

36. Umur

_____ tahun

37. Taraf pendidikan

- Less than high school (1)

- High school graduate (2)
- Some college, no degree (3)
- Associate's degree (4)
- Bachelor's degree (5)
- Ph.D. (6)
- Other (7)

38. Status pekerjaan

- Tidak bekerja
- Kerja separuh masa
- Kerja penuh masa

39. Jumlah pendapatan setahun

- Kurang daripada RM30,000
- RM30,000 to RM44,999
- RM 45,000 to RM69,999
- RM 69,000 to RM84,999
- RM 85,000 to RM99,999
- RM 100,000 to RM114,999
- RM 115,000 atau lebih

40. Jumlah isi rumah (termasuk diri sendiri)

- Satu
- Dua
- Tiga
- Empat
- Lima
- Enam atau lebih

41. Bilangan anak

- Satu
- Dua
- Tiga
- Empat
- Lima
- Lain-lain

42. Kawasan kediaman

- Bandar
- Pinggir bandar
- Luar bandar

Appendix 3. USF IRB Approval Letter



RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-7091

8/29/2017

Syahirah Razak
School of Advertising and Mass Communications
Tampa, FL 33620

RE: **Exempt Certification**
IRB#: Pro00031936
Title: Household Food Waste Prevention in Malaysia: An Issue Processes Model Perspective

Dear Mrs. Razak:

On 8/28/2017, the Institutional Review Board (IRB) determined that your research meets criteria for exemption from the federal regulations as outlined by 45CFR46.101(b):

(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:
(i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

As the principal investigator for this study, it is your responsibility to ensure that this research is conducted as outlined in your application and consistent with the ethical principles outlined in the Belmont Report and with USF HRPP policies and procedures.

Please note, as per USF HRPP Policy, once the Exempt determination is made, the application is closed in ARC. Any proposed or anticipated changes to the study design that was previously declared exempt from IRB review must be submitted to the IRB as a new study prior to initiation of the change. However, administrative changes, including changes in research personnel, do not warrant an amendment or new application.

Given the determination of exemption, this application is being closed in ARC. This does not limit your ability to conduct your research project.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,

A handwritten signature in black ink that reads "John A. Schinka, Ph.D." in a cursive style.

John Schinka, Ph.D., Chairperson
USF Institutional Review Board