

**FACTORS CONTRIBUTING TO FOOD WASTAGE IN
HOUSEHOLD CATEGORY**

AHMAD ADIB BIN DURIZAKI

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

APPROVAL

I/ We hereby declare that I/ we have read this dissertation, and in my opinion, this dissertation/report is sufficient in terms of scope and quality as a partial fulfilment of the requirements for the award of Bachelor of Technopreneurship with Honour

SIGNATURE :

NAME OF SUPERVISOR :

DATE :

SIGNATURE :

NAME OF PANEL :

DATE :

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CATEGORY

AHMAD ADIB BIN DURIZAKI

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DECLARATION

I hereby declared that this thesis entitled
“Factors Contributing to Food Wastage in Household Category”
is based on my original work except for quotations and citations which have been
duly acknowledged. I also declare that i has not been previously and concurrently
submitted for any other degree or award at UTEM or other institutions.

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NAME :

DATE :

DEDICATION

This humble work is dedicated to:

My supportive family, for the limitless love and sacrifices;

My dearest supervisor, for the never ending words of encouragement;

My greatest friends, for being who they are;

And above all

To Allah SWT, the Almighty and;

Muhammad SAW, the best teacher and messenger.

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ABSTRACT

Food wastage is almost being an untold issue in Malaysia that has been a barrier for Malaysia to achieve food and nutrition security as well as the sustainability of food systems. From the literature, it is known that households which is also the end part in the food supply chain are contributing to a significant amount of food wastage. This paper aims to identify the factors contributing to food wastage in household category. Subsequently, the level of awareness and understanding of food wastage in household category is analysed as well, through which Theory of Planned Behaviour was applied to enhance the awareness of the issue, and understanding of the factors to household food wastage. To strengthen the achievement of the objectives, a total of 325 completed responses were collected through a questionnaire-based survey; where responses were drawn using a random sampling population of household in Melaka Tengah district. Based on the findings, household in Melaka Tengah have a high level of awareness regarding the issue of food wastage, and understand the factors that aided to the generation of food wastage at home. The factors mentioned were change of lifestyle, behaviour of household, knowledge in managing and storing food at home, and purchasing of bulk or large packaged items. To reduce food wastage in Malaysia, it is necessary to set a strategy at all level of the food supply chain. This study provides an urgent need to gain households' and organizations awareness towards this issue and voice out the seriousness of the problem towards the environment and the economy.

Keywords: Household food wastage, Theory of Planned Behaviour, Factors of food wastage

ABSTRAK

Pembaziran makanan hampir menjadi isu yang tidak disuarakan di Malaysia yang menjadi halangan bagi Malaysia untuk mencapai keselamatan makanan dan nutrisi serta sistem makanan yang berterusan. Dari kesusasteraan, diketahui bahawa isi rumah yang juga bahagian akhir dalam rantaian bekalan makanan menyumbang kepada jumlah yang banyak kepada pembaziran makanan. Kajian ini bertujuan untuk mengenal pasti faktor yang menyumbang kepada pembaziran makanan dalam kategori isi rumah. Selanjutnya, tahap kesedaran dan pemahaman tentang pembaziran makanan dalam kategori isi rumah juga dianalisis, di mana Theory of Planned Behaviour digunakan untuk meningkatkan kesedaran mengenai isu ini, dan memahami faktor-faktor kepada pembaziran makanan isi rumah. Untuk mengukuhkan pencapaian objektif, sebanyak 325 maklum balas telah dikumpulkan melalui boring kaji selidik; di mana maklum balas telah diambil dari populasi isi rumah di daerah Melaka Tengah secara pensampelan secara rawak. Berdasarkan penemuan ini, isi rumah di Melaka Tengah mempunyai kesedaran yang tinggi mengenai isu pembaziran makanan dan memahami faktor-faktor yang membantu pembentukan pembaziran makanan di rumah. Faktor-faktor yang disebutkan adalah perubahan gaya hidup, tingkah laku isi rumah, pengetahuan dalam mengurus dan menyimpan makanan di rumah, dan membeli barangan secara borong atau makanan dibungkus di dalam pakej yang besar. Kajian ini memberikan desakan untuk menaikkan kesedaran isi rumah dan organisasi terhadap isu ini dan menyuarakan keburukan masalah pembaziran makanan terhadap alam sekitar dan ekonomi.

Kata kunci: *Pembaziran makanan isi rumah, Theory of Planned Behaviour, Faktor kepada pembaziran makanan*

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LIST OF ABBREVIATIONS

TRA	=	Model of Theory of Reasoned Action
TPB	=	Model of Theory of Planned Behaviour

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The first chapter of this research paper will discuss the background of study involved in this study along with problem statement that the researcher will discuss briefly throughout this whole research paper. Next, the aims or objectives that the researcher wanted to achieve at the end of this research as well as be able to answer the research questions listed. The scope, key assumptions and the significance of this research is also discussed in this chapter

1.2 Background of Study

Food wastage is a worldwide problem whether in developed or developing country which gives a negative impact on the country's economic and social industrial development and at the same time gives a negative thoughts about their citizen's bad manners towards food. Food wastage is food that is in good quality and qualified to be consumed by the consumer but does not being eat up because it is rejected either before or after it spoils (Lipinski *et al.*, 2013). Food wastage give a negative effects to the community health as it rot, giving out awful odour and attracts

any kinds of dangerous pests besides costly for the government to discard it (Diggelman and Ham, 2009). Food worth billions of dollars is wasted by the developed economies of the global development every single year. As food is wasted, problems started to arise which, more than 95% of the food waste will be piled up at landfill sites which then being converted to methane, carbon dioxide and other greenhouse gasses via the process of anaerobic digestion (Melikoglu, 2013).

Household represents the category that contributes the most of food wastage globally in most of the countries that are facing this problem such as Turkey, United Kingdom and not to forget, Malaysia. Everyday Malaysians waste about 15,000 tonnes of food and about 3,000 tonnes from the waste is actually food that is completely consumable by the people (The Star, 2016). A research done by Malaysian Agricultural Research and Development Institute (MARDI) shows that 28.4% rice and 20% to 50% of vegetables and fruits are wasted. Household food wastage can be defined as any sources of food and drinks that are consumed within the house including retails and contributions of food wastage from homemade and also takeaway food (Parfitt, Barthel and Macnaughton, 2010).

Factors to this obvious problem is less foresee by researchers which resulting to less information about factors contributing to the food wastage. Even though it can be think with the common sense in help, a proper research need to be done to clear the understanding of factors that contributing to food wastage. Household food wastage is mainly interrelated to three factors which are food that is bought not according to the consumer's needs, lack of knowledge of food storage management and food prepared in excessive portions compared to the portions that will be consumed (Diggelman and Ham, 2009). Some of the factors will be analysed thoroughly in this research paper alongside with other propose factors.

1.3 Problem Statement

The first research problem is the concern regarding the increasing number of household food wastage in Malaysia as according to Deputy Minister of Agriculture and Agro-Based Industry, Malaysians waste 15,000 tonnes of food daily including 3,000 tonnes of food that is still can be consumed (The Star, 2016). The problem rises up in the month of Ramadhan where every year, during the month of

Ramadhan, 270,000 tonnes of food that is still fit to be consumed and could have fed more than 180 million people is wasted (Malaysiakini, 2016). In Melaka where the research is conducted, Melaka household create an upsetting amount of waste in a day which is 1,000 tonnes with more than half of the waste consist of food and organic. The trends of discarding consumable food by Malaysians is a very major concern that could defamed the image of Malaysia as an Islamic Country which also will affect Malaysia's economic and social development to be better in the future.

Secondly, there is little to none research done focusing on the factors contributing to household food wastage, so this research can help other researchers to understand the factors that contribute to food wastage in household category. Most of the research on food wastage targeted on the creation of food wastage at the production and distribution level in the supply chain (Lanfranchi *et al.*, 2016). The previous studies had briefly explained the occurrence of food wastage at every stage; when the food is farmed or in its raw shape, when the food is being processed and the distribution of the food to the retailers or convenient stores but did not explain the food wastage that occurs at the end user or consumer stage. Therefore, this study is needed to complete the explanation of the factors that influenced food wastage to occur at the end user stage or for this research, food wastage from household perspective.

Thirdly, most consumers are found started practicing steps to prevent food wastage without fully understood the factors to the food wastage which can be more beneficial for them to curb the food wastage problem. Donating food is the most common practiced behaviour to prevent food wastage among household and major changes in consumer attitudes towards food is poorly practiced (Cox *et al.*, 2010). However, not all consumer are practicing the steps to prevent food wastage as according to (Cox *et al.*, 2010), prevention of food wastage is more common to certain characteristics of consumer such as older in age, has middle or high income, female, did not have children and environmentalist.

1.4 Research Questions

This research is conducted to answer the following questions:

- i. What are the factors contributing to food wastage in the household category?
- ii. What is the level of awareness and understanding of food wastage in household category?

1.5 Objectives of the Study

The research is done by giving out questionnaires to the selected household consumer in Melaka Tengah, to achieve these two objectives:

- i. To identify the factors contributing to food wastage in household category.
- ii. To analyse the awareness and understanding of food wastage in household category.

The information may provide a clear understanding about the factors that contribute to household food wastage and eventually be able to identify the most significant factor to household food wastage.

1.6 Research Scope and Key Assumptions

The researcher is determined to study about the factors that contributed to food wastage specifically in the household category. The scope of the research is the factors contributing to food wastage only in household category in the district of Melaka Tengah, Melaka as the district has the most dense population of household in Melaka.

Household category is one of the scope of this research, hence, researcher will only focus on household as the end user which is the last part in the supply chain. Besides, the end user is proved to be the most contributor of food wastage; therefore, other contributors of food wastage along the supply chain such as the supplier, manufacturer, distributor and retailer will not be discussed in this research.

Next, this research will only be limited in Melaka Tengah for the location of the data collection. This study is restricted to Melaka Tengah district due to the location having the highest population and covered about half of the overall population of Melaka; where the higher the population the higher the chances of food to be wasted as stated by (Lim *et al.*, 2016) . Therefore, the questionnaire will only be distributed to household of Melaka Tengah. A briefer explanation on the choosing of the research location will be done in methodological choice chapter which is Chapter 3.

In this research, key assumption that can be brought up is that the respondents that involved are honest and trustworthy when providing their answers in the questionnaire given. Besides that, the researcher assumed that the respondents involved possessed adequate knowledge on the issue of food wastage in general.

1.7 Significance of Study

The study will give insightful points to the interested parties such as the state of Melaka about the key factors that led to household food wastage and create ideas on how to implement more efficient food wastage managements as they will be able to identify those factors. Moreover, this study will help to reduce any literature gap in the study of factors of food wastage in household category.

1.8 Summary

Based on all of the sub-sections especially the aforementioned research questions and research objectives, this research will be focused on factors of food wastage in household category in Melaka Tengah District. The incoming section of this research paper will be the review of the previous academic literature in this field and the theories applied by the researchers.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The second chapter of this study is discussing in-depth about the focused topic in this research paper along with literatures from various sources in the same topic area with this research. Findings from previous research also is portrayed in this section as well as the theory used to prove the findings so that it can be adapted with this research. This section started with the same problem in a huge point of view of developed and developing country before being narrowed down to in Malaysia's point of view until it is fit with this research topic. Next is the research framework made by the researcher to list out the factors that contributing to food wastage in household category.

2.2 Food Wastage

For some, the terms food loss and food waste could be in the same perspective, but in fact, the two terms are very much different as in their respective definitions. Food loss refers to food that did not reach the final step in the food supply chain to be a consumable product because of its quality and condition is downgraded, the food is spilled, ruined or vanished before reaching the final product stage. The definition of food wastage is any food that has been through the food supply chain resulting a final product that is in a good quality and is consumable but still does not get fully consumed because of being wasted or disposed neither it is still in good condition to be eaten nor it is left to be spoiled (Bagherzadeh, Inamura and Jeong, 2014).

In food supply chain, food loss is commonly known to exist at production, postharvest, processing and distribution stages while food waste mostly created at retail and at the end user stages (Bagherzadeh, Inamura and Jeong, 2014). As according to Yildirim *et al.* (2016), the two terms can simply be compared as food that did not reach final consumer and lost along the supply chain is considered as food loss while food being waste by the final consumer is called food waste. According to Principato, Secondi and Pratesi (2015), because of lack of technical, economic and managerial resources, food loss typically happened at the early stages of food supply chain. Nonetheless, the piled up of food wastage created at the consumption stage is undoubtedly to be the prime contributor to the amount of food wastage in a country.

2.3 Food Wastage in Developed and Developing Country

Food wastage is a difficulty that is an exceptionally significant in the modernized twenty – first century world. Every year, 1.3 billion tonnes of food is wasted in the world which represents a one – third of the total world food production (Stepien and Polcyn, 2017). A research done by the Food and Agriculture Organization of the United Nations (FAO) clarifies that globally, along the food chain, one – third of eatable food is wasted that summed up of 1.3 billion tonnes of food wasted each year (Wahlen, 2016). This issue is also the obvious proof on how people awfully treated their own beloved planet by creating this never – ending piled

up food waste at the landfills which could harm planet Earth. The landfills piled up food waste will produce methane gas, a greenhouse gas that is more vital than carbon dioxide. Excessive greenhouse gasses such as methane, carbon dioxide and chlorofluorocarbon absorb infrared radiation and causing global warming as the Earth is being heated up and other climate changes will happen.

According to Melikoglu (2013), food wastage amount is universally stated in terms of billions of dollars. Three leading economies of the World or also called as developed countries; United States of America, United Kingdom and Japan are on the top of the food wastage list by countries. Developed countries or also known as industrialized countries wasted most of its consumable food at the ending stages of food supply chain which are retail and consumption stages. The factors of the food wastage in industrialized country includes the iniquitous attitudes of its people in general such as producing or purchasing food more than they can consume and little knowledge in storing food (Principato, Secondi and Pratesi, 2015).

United States that received massive amount of varieties food product available for them makes the Americans afford to spend more on food than other country's citizen which would create a big chance for them to make waste on food. Each year, Americans wasted approximately 35 million tonnes or 77 billion pounds of food that is worth 30 billion dollars (Melikoglu et al., 2013). It is stated that food wastage results negatively in economic growth of American as a family of four has wasted away a minimum of \$589.76 dollars of food per year and it is estimated that United States of America wasted about 90-100 billion annually with household as the top contributor with 48.3 billion of food being wasted (Parfitt, Barthel and Macnaughton, 2010).

In United Kingdom, one third of the food sold ends as waste and half of the amount is still edible. A survey done by Waste and Resources Action Programme (WRAP) shows that the UK household food wastage is at a serious state with every single year, about 8.3 metric tonnes of food and drink that worth 12.2 billion pound sterling is wasted and 25% by weight of the overall food purchased by UK household is wasted every year (Parfitt, Barthel and Macnaughton, 2010). British households wasted 7.2 million tonnes of food waste in 2010 which also according to a report WRAP of the UK government. Even though the food cost in UK has increased by

20% since 2007, food worth 12 billion dollars are still being wasted by the British households (Melikoglu et al., 2013).

In Japan, the people are wasting away corresponding amount of food as their country is producing (Kawashima, 2002). Japan as one of the most disciplined country and has the most polite people also cannot avoid the issue of food wastage. As according to Kawashima (2002), food wastage in Japan has been well used as animal feed, but it has been put down nowadays to protect the health of some exotic types of animals that was introduced in Japan, besides the low price of animal feed and products which had decreased the use of food wastage as animal feed. Eventually, emissions of threatening greenhouse gasses occurred in Japan as only 5 percent from 20 million tonnes of food wasted each year is used for animal feed while the rest of the waste is dumped into landfills and incinerated (Kawashima, 2002).

Under developed or developing countries are facing the same problem but a slightly less critical than the developed countries. Tunisia as one of the developing country is developing some approaches, investigations and interventions to curb the food wastage issue. Tunisia is included in the Near East and North Africa (NENA) region and although it is facing a food scarcity and depends on food imports that covered about 50% of its overall food supplies, Tunisian are still wasting away food with a staggering figure of 250kg of food per person annually (Sassi *et al.*, 2016) An online survey made by Sassi et al., (2016) had proven that about 50% of the survey respondents claimed that they discarded food that can still be eaten and most of the food wasted are fruits, vegetables, cereals and also bakery product. The scarcity of food had made the severe issue of food wastage in Tunisia to be immediately diminished because of the people relies on import food to consume in their daily lives.

Another developing country, Turkey is having its population growth and the people's diet changes has made a demand in food to increase as well as the increasing number food wastage. An online survey by Yildirim *et al.* (2016) shows a result of 95% from 150 respondents agreed that they are the contributors to food wastage and 90% of them assumed that during the month of Ramadhan, the amount of food being wasted becomes bigger. The Turkey Ministry of Food, Agriculture and