University of Reading

BIN IT OR BITE IT? AN INVESTIGATION INTO BRITISH AND THAI CONSUMER PLATE WASTE BEHAVIOUR

PhD in Agricultural and Food Economics

Department of Applied Economics and Marketing
School of Agriculture, Policy, and Development

Ponjan Pinpart

January 2020

Declaration

I confirm that this is my own work and the use of all material from other sources

has been properly and fully acknowledged.

Ponjan Pinpart

Abstract

To tackle a problem of food waste (FW), a better understanding of consumer food waste (CFW) behaviour is essential. This thesis aims to investigate CFW behaviour in meal settings by comparing British and Thai consumers with the focus on their decision to save leftover food. This thesis highlights five key factors; commensality, place of dining, food price, the amount of leftover food, and future meal planning. The research is based on three projects. First, we conducted in-depth interviews with 20 Thai food service providers to gain an understanding of the CFW situation in Thailand. Results from this study show that consumers left food uneaten in a restaurant due to demographic factors, food satisfaction, over-ordering, hunger status, and food safety concerns. However, some consumers adjusted their food (e.g. amount, taste, and ingredients added into dishes) and asked for leftovers food to be taken away to prevent plate waste. Second, an online survey provided quantitative data from 208 British participants and 209 Thai participants. The results show that cost is a significant factor affecting CFW decisions for both British and Thai consumers. While the place of dining is an important factor for the British, it is not for the Thais. The interaction effect between factors of commensality and amount of leftover has a significant effect on British consumers plate waste decision whereas it is the interaction between the commensality factor and the place of dining that significantly affect Thai consumers. Third, a qualitative method using focus group discussion technique was carried out to gain in-depth opinions and experience from consumers from both countries. The results proved that consumers tend to save more expensive food, British consumers have higher self-conscious when dining out in a restaurant and tend not to ask for a doggy bag for their leftovers but it would depend on the amount of the leftovers. Moreover, we also found a complex connection of factors affecting CFW decisions. This thesis concludes that food cost has a significant effect on all consumers whereas the place of dining only affects British consumers. The commensality is significant when being considered with the amount of food remaining for British and with the place of dining for Thai consumers. We hope to provide information for policymakers and stakeholders to solve the problems of CFW.

Acknowledgements

First, I would like to say a huge thank you to my supervisor, Dr Daniele Asioli. Thank you for taking me under your wing and revitalising my PhD life. Thank you for challenging me academically but also making me feel like I was not being abandoned. I would also like to thank my co-supervisor, Professor Kelvin Balcombe, for sharing his experience, expertise, and for always being there to help me whenever I struggled. Many obstacles I encountered would not have been overcome so easily without his guidance. I also had the support and encouragement in the first two years from my previous supervisors, Professor Nikos Georgantzis and Dr Nick Bardsley.

I want to thank the School of Agriculture, Policy, and Development for partially funding the online survey study. A special thanks to Professor Julian Park who makes every international student feel at home. I would like to express my sincere gratitude to my PhD progress monitor, Professor Chittur Srinivasan, for providing excellent support and constructive comments. I would also like to acknowledge our focus group discussion sponsors, The Graduate School Travel Support Scheme Committee, Bolan Thai restaurant in Reading, UK and Loving Hut, Rama III, Bangkok, Thailand, with special thanks to Khun Pradit Buradorn (P'Dizz) from Bolan and Khun Sonya Soraya Osonphasop from Loving Hut. I am particularly grateful for the assistance given by Agnese Rondoni, Erin Wallace, Mingpieng-or Pinpart (P'Ploy), Payuda Harnsoongnern (Kungwan), Atikrit Chanjavanakul (Doam) to facilitate focus group discussion sessions. Thanks to all participants and respondents who took part in this research.

I would like to express my gratitude to everyone at the Global Recruitment Team (International), the University of Reading who has contributed to the fun parts of my life in the UK while doing this PhD. Thank you to all my friends and my colleagues in office 304 and 2L04, with special thanks to Oana, N'View, P'Oh, N'Sai, Kostas, Nur, Neia, José, Toju, Tuyo, Krishnal, Harmi, Mahmood, Heather, Lydiah, Ding, N'Nat, N'Gig, Moe-chan, Am, Goi, Yee, Yod, Bia, N'Mai, Penny, Attasuda, and Monlapak, to name a few. Everyone has been part of my life-changing journey.

I would not have done this without Lee Walter. I might have packed my bags and given up a long time ago. To my beloved family, P'Ploy and N'May, thank you for being by my side and helping me in everything. Ultimately, I owe a significant debt to my mum, who has greatly supported me financially, mentally, spiritually, and physically when I was hospitalised. As an Asian person, filial piety virtue is still highly extolled. Seeing you happy because I have been doing this PhD makes me so happy as well.

Dedication

I would like to dedicate this thesis to my dad, Booncherd Pinpart, who passed away too soon to finish his PhD thesis in 2011.

“แด่พ่อเชิด”

I would also like to dedicate this thesis to Dr Duenden Nikomborirak, the former research director at Thailand Development Research Institute (TDRI) and the former leader of the food waste reduction project in Thailand. Sadly, Dr Duenden passed away in the tragic accident in Bangkok last year (2019) when projects about food waste in Thailand had started to take shape. May her soul rest in peace.

“ขอผลบุญจากความตั้งใจที่ดีในการทำงานวิจัยเพื่อประเทศชาติของข้าพเจ้า ช่วยส่งดวงวิญญาณของอาจารย์เดือนเด่นสู่สุขคติในสัมปรายภพ”

Table of Contents

List of Tables

List of Figures

List of Acronym

Acronyms	Definitions
APEC	Asia-Pacific Economic Cooperation
BHA	The British and Hospitality Association
CFW	Consumer food waste
EPA	The US Environmental Protection Agency
ERS	Economic Research Service
EU	The European Union
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus group discussion
FL	Food losses
FSP	Food service provider
FW	Food waste
GWP	Global warming potential
GHG	Greenhouse gas
NA&O	North America & Oceania
NHS	The National Health Service
PATA	Pacific Asia Travel Association Sustainability & Social Responsibility Department
PBC	Perceived behavioural control
PM	Projective mapping
ROL	Rank-ordered logit
ROML	Rank ordered mixed logit
SGDs	Sustainable Development Goals
S&SEA	South and South-East Asia
SRA	The UK's Sustainable Restaurant Association
SSA	Sub-Saharan Africa
TDRI	Thailand Development Research Institute

List of Acronym (continue)

Acronyms	Definitions
TH	Thailand
TPB	Theory of Planned Behaviour
UK	The United Kingdom
UN	The United Nations
UNEP	The United Nations Environment Programme
The US	The United States of America
USDA	United States Department of Agriculture
VE	Vignette experiment
WHO	World Health Organisation
WRAP	The Waste and Resources Action Programme (UK)

Chapter 1
Introduction

1.1 A problem of consumer food waste

Consumer food waste (CFW) is food waste (FW) generated by consumers at the retail, food service, and household levels. One of the targets in the UN Sustainable Development Goals (SDGs) is: “By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses” (Target 12.3) (UN, 2016). About one-third of food in this world is produced but not eaten (Parfitt et al., 2010; FAO, 2011)[1]. While food is abundant, there is another major issue of hunger or food insecurity in our planet (Ingram et al., 2010; FAO, 2015b). This has already put pressure on the food production and allocation of food. Wasting food also wastes agricultural inputs and resources used for producing food (Vandermeersch et al., 2014). Definitions of key terms, quantity of FW, and the impact of the problem will be presented in the following sections.

1.2 Definition of key terms: food loss and food waste

FL is a broad term for “reduction of food produced for human consumption” (FAO, 2011). FAO[2] defines FL as “the decrease in edible food mass throughout the food supply chain that specifically leads to edible food for human consumption” (FAO, 2011). In other words, it is the part of food that should be consumed by the end consumers but is not. This loss takes place during the production, transportation, food processing, and distribution and the causation includes mechanical damage, spillage, or sorting for suitable food processing (Parfitt et al., 2010; FAO, 2011; 2019). According to the latest report from FAO (2019), FL is the reduction of food quantity from farm to, but does not include, retailer. The term “postharvest loss” has also been used in a similar sense (Bourne, 1977). However, a team from USDA argued that “food loss is a subset of post-harvest loss, or excluding the production stage, and represents the edible amount of food available for human consumption but not consumed” (Buzby and Hyman, 2012). Put another way, the definition of FL by FAO highlights more aspects

[1] Up until December 2019, the study by FAO in 2011 is still the only study providing quantitative data of global FL and FW of the entire food supply chain (FAO, 2019).
[2] Food and Agriculture Organization of the United Nations

of the initial stages of the food production whereas the USDA emphasises more at the stages after primary producers. All in all, the term food loss covers food intended for human consumption, but is taken out of the food chain, particularly at the upstream. There is a second term, food waste (FW), which is often used at the downstream side of the food system.

The terms FW and FL are interconnected and have some repetition (FAO, 2014a). The USDA defines FW as "a subset of food loss" (Hodges et al., 2011). However, Parfitt et al. (2010), FAO (2011), researchers and experts in FAO (2019) clearly indicate that FW is a loss of food by retailers, food service providers (e.g., restaurants) and consumers. This explanation does not imply that FW is part of FL and it provides a clearer picture of where the waste takes place. FW occurs because of human behaviour and decisions at the retail and consumption level such as shopping for food with no plan, lack of knowledge about date labels, cooking too much food, and not reusing leftover food in other meals (Parfitt et al., 2010; FAO, 2011; Buzby et al., 2013; FAO, 2019).

Furthermore, there are two types of FW: 1) the waste that could have been prevented and 2) food that is inedible and inevitably has to be thrown away such as bones, fruit peels, and stones. WRAP, a key charitable organisation in the UK for sustainable use of resources, calls these two FW categories avoidable and unavoidable FW, respectively (Quested, Ingle, et al., 2013). FW context adopted by ERS[3] from USDA includes the edible part of food that is not consumed and discarded by retailers and consumers. Therefore, all core organisations define FW as the loss of food taking place at the downstream side of the food chain nearer to the final consumption. The FAO and WRAP definition involves more of the behavioural aspects of FW generators whereas USDA focuses more on the edibility of the FW. Nonetheless, the conclusion in these definitions is still unclear because what is edible could be varied in different communities. Food consumed in one ethnic group might be "waste" in others (e.g., offal or chicken feet) (Tucker, 2013).

Due to the availability of data in the real world and limitation in conducting research (Parfitt et al., 2010; FAO, 2019), not every study can be carried out to be in line with the above definitions. For example, Beretta et al. (2013) quantified FL and FW in the Swiss food supply chain. Both avoidable (e.g., waste from leftover food) and unavoidable (e.g., bones and peels) FW were combined together as a single unit.

[3] Economic Research Service

Katajajuuri et al. (2014) and Stancu et al. (2016) examined only the volume of avoidable FW in Finland and Denmark, respectively. Therefore, comparing results between those works would be challenging due to the different boundary of the terms. Setting a specific framework of FL and FW in a study will, therefore, depend on the nature of the research, objectives, and the ability to get access to the data. Defining the key terms will enable researchers to compare results with other studies.

1.2.1 Food loss and food waste definitions and boundary in this thesis

This thesis focuses on FW generated by consumers because of their behaviour. Therefore, the term FW will be used and this is based on the definition by FAO (FAO, 2011; FAO, 2019). In particular, "consumer food waste (CFW)" will reflect more in the specific context of this thesis to emphasise FW that occurred by consumers (i.e., not by the retailer's decisions or by restaurant staff). Some proportion of food will be inevitably thrown away in practical occasions, and only edible parts in the total sum of FW would be difficult to observe.

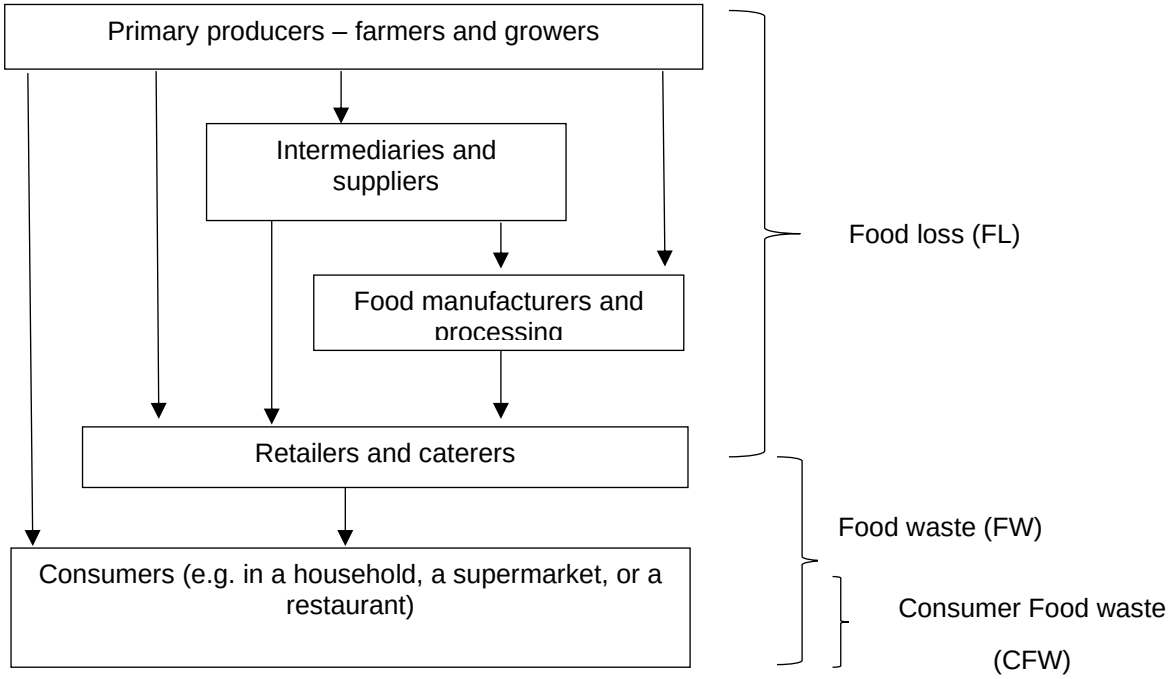


Figure 1 Indication of FL, FW, and CFW in a linear food supply chain (adapted from Knight et al. 2002))

This research uses CFW to refer to food that is produced for human consumption but has left the food value chain at the consumption stage due to the consumer's

behaviour. Basically, throughout this thesis, CFW will refer to both unavoidable and avoidable FW. Where appropriate, when a general situation of loss of food in the supply chain and waste of food at the downstream of the supply chain is referred to, FL and FW will also be used, respectively. Figure 1 shows the framework of FL and FW in this thesis, as adapted from Knight et al. (2002).

1.3 Quantification

The magnitude of the problem varies in different parts of the world. The only global estimates to date by Swedish Institute for Food and Biotechnology (SIK) and FAO using mathematical conversion of input and output of the food (i.e., extrapolation) show that one-third of global food is lost and wasted (FAO, 2011; 2019). In the FAO 2019 report, Food Loss Index (FLI) and Food Waste Index (FWI) are two key indicators to measure progress in achieving the SDG target 12.3 (FAO, 2019). The work on the former index is more advanced than the latter (i.e., more data) (FAO, 2019). Therefore, the report has recently indicated that around 13.8% of food is lost (food loss; FL) globally from farm to distributors (FAO, 2019). The measurement of FW quantity is more challenging (Bellemare et al., 2017). For the rough estimates of FL and FW in the whole supply chain, FAO (2011) reported that North America & Oceania (NA&O) and Europe are the top two regions who generated the most FL and FW (FAO, 2011). On the other hand, Sub-Saharan Africa (SSA) and South & South-East Asia (S&SEA)[4] are the least (Parfitt et al., 2010; FAO, 2011; 2014b). In Europe and NA&O regions, 95-115 kg/year of food are wasted per person at the consumption stage (FAO, 2011). For SSA and S&SEA regions, approximately 6-11 kg/year do not reach the end consumers (FAO, 2011). Dung et al. (2014) reported the global estimate and found that FW per capita on average in developed and developing countries is 107 kg/year and 56 kg/year, respectively. If considering commodity types, the magnitude of the problem is varied in different food groups as well as in different parts of the world. Figure 2 and Figure 3 show a comparison of FL and FW for each type of food between four regions. At the consumption stage, cereal, roots and tubers, and fruits and vegetables are highly wasted particularly in Europe and NA&O(FAO, 2011). One of the

[4] In the FAO 2011 report, South-East Asian countries were grouped with South Asian countries. However, in the latest report (FAO, 2019), South-East Asia is grouped with Eastern Asian countries. Some countries in South-East Asia are also missing from these reports, such as Singapore. Therefore, the estimates would be considered as a very rough approximation.

reasons for this large waste volume of these commodity groups could be its high perishability that requires shelf-life controlling (Osagie, 1995; FAO, 2019).

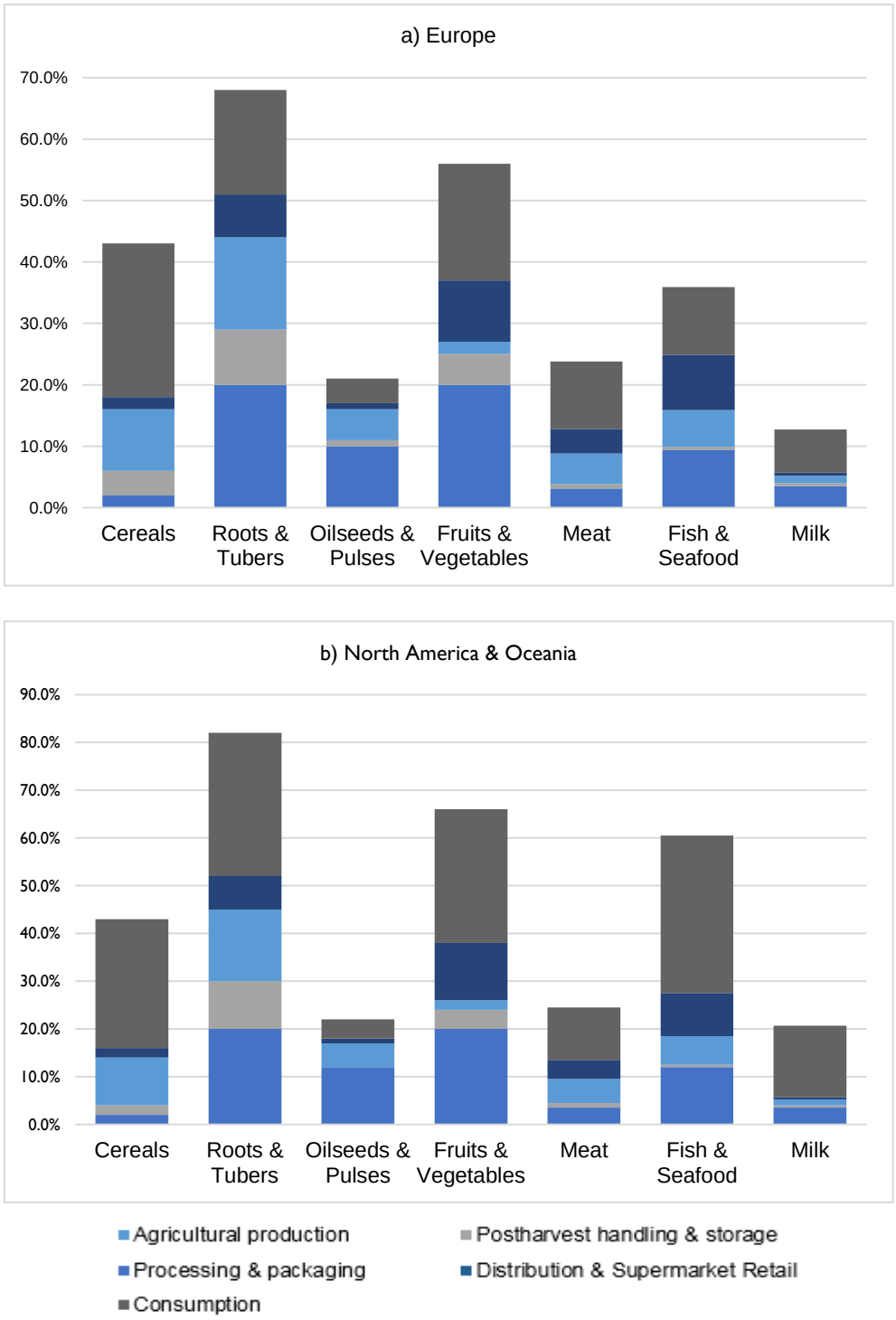


Figure 2 Proportion of food loss and waste at different supply chain stages in a) Europe and b) North America and Oceania (FAO, 2011)

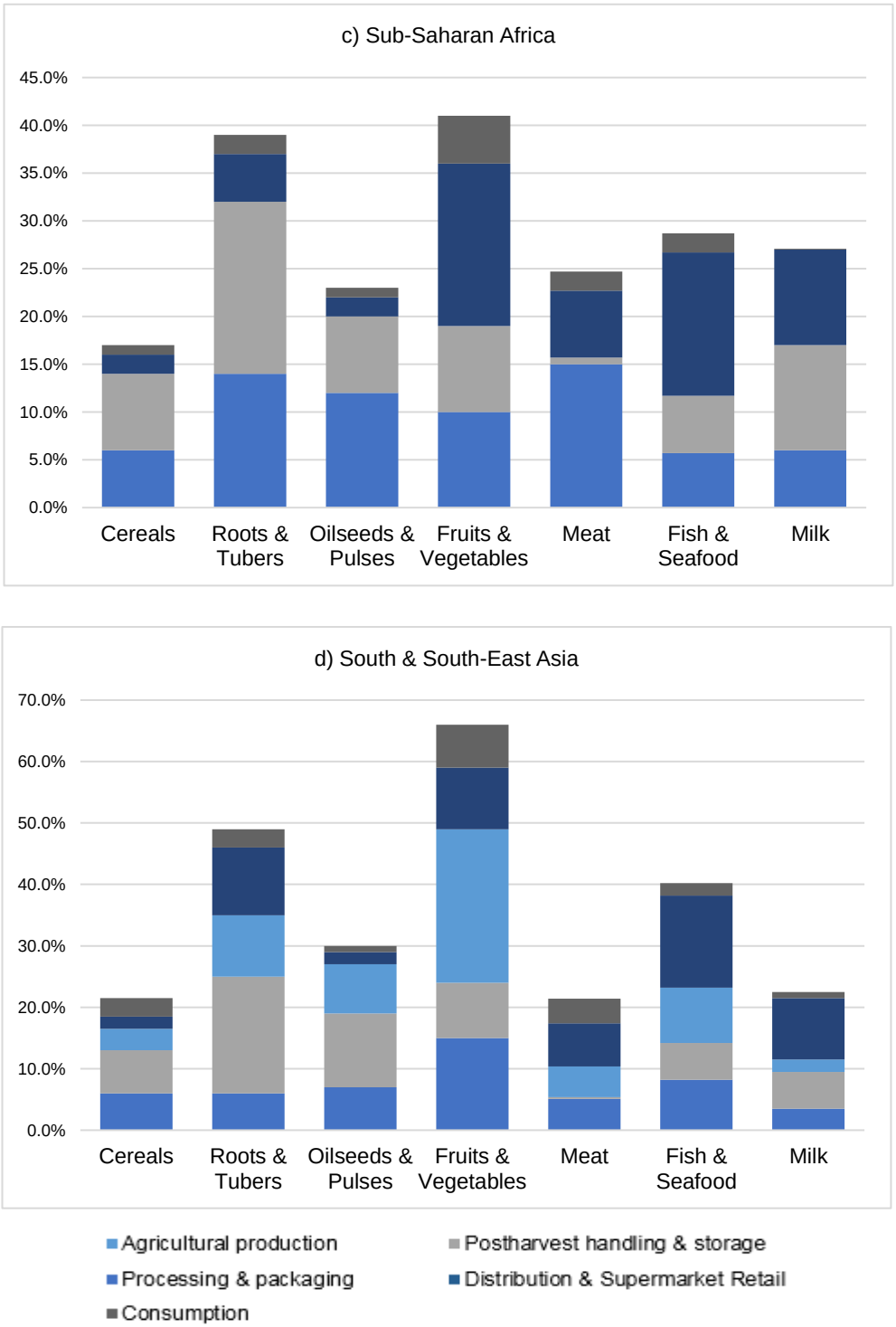


Figure 3 Proportion of food loss and waste at different supply chain stages in c) Sub-Saharan Africa and d) South and South-East Asia (FAO, 2011)

Evaluation of the magnitude of FW quantity should be investigated in a specific context. In other words, the measurement should be done in particular food categories and sectors to gain insights into the problem (Beretta et al., 2013; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015). However, comparison between studies can be difficult because of different sample sizes, observation units (weight, nutritional value, or monetary value), and definition of key terms (Møller et al., 2014; FAO, 2019).

After the initial statistical estimation of FL and FW quantity from FAO, many scholars have conducted studies in order to shed light on the volume of FL and FW. Beretta et al. (2013) used mass and energy analysis (i.e., calories) to quantify FL and FW of twenty-two food types[5] in Switzerland based on details reported by food companies, public organisations, and literature. The results from this study show that the main contributor is household consumer where 23% of calorific content of food is wasted, and 16% of this amount could have been avoided (i.e. should not be wasted or should have been consumed) (Beretta et al., 2013). Williams et al. (2012) attempted to evaluate the amount of FW by using a food diary method with Swedish families. In one week, they wasted approximately 1.7 kg of avoidable FW per household (Williams et al., 2012). The figure is not much different from Joerissen et al. (2015) who investigated the amount of CFW *per household* among consumers in Italy and Germany using an online survey and found that each household wasted food 2.0 kg/ week.

However, empirical studies can also be subject to consumer bias since it is mostly based on self-report data. Parfitt et al. (2010) and Quested, Marsh, et al. (2013) pointed out that the volume of FL and FW from mathematical conversion (i.e., from FAO 2011 report) could be overestimated whereas the weight of FW in the real-world could be underestimated. FW generated by the food service sector (e.g., a restaurant, a café, or a canteen) has also been addressed in the literature even though it has not gained attention widely. There is an estimated amount of FW that occurs at this level such as in Germany (Kranert et al., 2012), and Finland (Katajajuuri et al., 2014). We can see that attention has been drawn to FW in the developed countries more than in developing countries. According to Minor et al. (2019), quantifying the volume of FL and FW is less important than gaining insight into the causes of the problems. Because

[5] Twenty-two food categories are apples, fresh fruits excluding apples and berries, berries, canned fruits, potatoes, fresh vegetables, storable vegetables, processed vegetables, bread and pastries, wheat and pasta, rice, maize, sugar, oils and fats, milk and other dairy products excluding cheese and butter, cheese, butter, eggs, pork, poultry, beef and other meat/offal, and fish.

the food supply chain is a complex system, reducing the quantity of the wastage at one level could simply mean a change in where it is taking place (Minor et al., 2019). FAO (2019) also mentioned that it is time to move forward beyond quantifying the amount. In other words, we should gain better understanding of why and how FL and FW occur. The reduction of FL and FW at one point in the supply chain might mean pushing that quantity from one sector to others, which is not a sustainable way of tackling the problem.

1.4 Impacts of food loss and waste problem

1.4.1 Economy

There has been an increase in the world population, and therefore, the demand for food has increased (UN Department of Economic and Social Affairs Population Division, 2019; FAO, 2015b; Martindale, 2015). With a higher level of FL and FW, producers can be challenged to supply more food to meet the higher demand and consumers could face higher costs of food (Britz et al., 2014; FAO, 2019). Globalisation has connected producers, buyers, and consumers in an economy which allows food to be traded on the international market (Young, 2012; FAO, 2015a). Therefore, wasting food in one part of the world would affect the availability and price of food globally (FAO, 2015a).

The loss of economic value from losing and wasting food at the global level was estimated at US$ 1 trillion (FAO, 2015a). In the US, Buzby and Hyman (2012) highlighted that FW at the consumption level was equal to the loss of 165.6 billion US dollars in 2008 and approximately 936 US dollars per year per household (average two to three people per household). In the UK, retail prices of avoidable food and drink waste at the household level is equivalent to £12 billion (Quested et al., 2011). However, some sectors in the economy (e.g., business) could exploit this situation such as to sell more food products due to more food shopping trips from consumers (Rutten, 2013) and saving production cost because of using by-products to create new food products (Iriondo-DeHond et al., 2018; Grasso et al., 2019). Nonetheless, these examples provide a single perspective of a loser and winner (i.e., consumers and producers) in the economy. In the real situation, there are more players and therefore more costs and benefits to consider (Britz et al., 2014).

FW reduction will result in losses and gains in the economy particularly among private sectors (Rutten, 2013; Britz et al., 2014; FAO, 2019). Actors in the food supply chain would likely adopt FL and FW reduction measures as long as they are cost effective or profitable (FAO, 2015a; 2019). If it is, they would potentially take actions toward that goal. FAO (2019) stated that reducing FL and FW would potentially increase business profits and reduce consumers' food costs. Productivity gains from FL and FW reduction are due to improved efficiency of input utilisation (FAO, 2019). The UK's Sustainable Restaurant Association (SRA) found that avoidable FW on restaurants' customers' plates cost approximately £0.97 per plate (The Sustainable Restaurant Association, 2019). For every £1 cost of investment in FW prevention, the sector would be able to save around £7 (The Sustainable Restaurant Association, 2019). From a business perspective, seeing higher profits would encourage the actor, a restaurant in this case, to reduce FW and allow them to sell food at a more reasonable price (FAO, 2015a; Burton et al., 2016). Consumers would benefit from lower food prices accordingly. At the household level, consumers would require less food after the FW reduction practice and they would gain from less spending on food (Canali et al., 2017). One of the consumers who participated in the "Love Food Champions", a FW reduction project in the UK by The Waste and Resources Action Programme (WRAP), could save approximately 30-40% of her usual weekly food shopping expense from adopting a food-saving measure at home (Falcon et al., 2008).

The US Environmental Protection Agency (EPA), as well as the UN Environment Programme (UNEP), have been trying to promote cost-saving as economic benefits from FL and FW reduction across the whole food supply chain sectors (UNEP, 2011; United States Environmental Protection Agency, 2012). Those benefits are, for example, the decrease of disposal fees and lower tax from participating in donating food to charities (in the US) (United States Environmental Protection Agency, 2012). However, there could be a downside of the effort to reduce FL and FW. Britz et al. (2014) pointed out that there are associated costs to reduce FW, which also affects the economy and should not be neglected. For example, the household might have to spend more money on cold storage facility (e.g., increase the size of their refrigerator) or spend more time preparing better food because food that is not tasty or not well prepared could likely and easily be wasted. Therefore, with all these arguments, it is important for policymakers to consider all costs and benefits and factors affecting the economy from FL and FW as well as the cost of FL and FW reduction which can be varied in different parts of the world (Britz et al., 2014).

In addition, there are external and indirect costs incurred due to CFW. For example, FW from household might create extra waste handling costs and pollution in a community who live in proximity (Rispo et al., 2015). Moreover, consumers may have to trade-off between costs occurred from leaving the food uneaten after a current meal and opportunity costs that may be occurred due to more cooking or preparing time needed if the leftover food is not saved for later meals (Ellison and Lusk, 2018). The background idea is based on household utility maximisation, and it is a function of costs (such as food ingredients and opportunity cost to forgo) to prepare a new meal (Becker, 1965; Chin, 2008; Ellison and Lusk, 2018). Moreover, even though consumers do not cook but eat out, time spent in a restaurant would account for the total cost of that meal (Atkinson and Deeming, 2015). Therefore, the decision to save or not to save leftover food lies on the assumption that consumers would or would not want to forgo the costs for the food preparation to maximise the utility (Lusk and Ellison, 2017; Clark and Manning, 2018; Ellison and Lusk, 2018).

1.4.2 Environment

A rise in demand of food means more resources need to be acquired and will be used up; e.g., land, water, fertilisers, energy, and labour (Hall et al., 2009; FAO, 2015a; Tonini et al., 2018). The extra acquisition poses a threat to nature due to the insufficiency of natural resources, loss of biodiversity, and pollution (Pinstrup-Andersen and Watson II, 2011; Pullman and Wu, 2012; Young, 2012; FAO, 2013). Most researchers investigating the environmental impact of FL and FW use Global Warming Potential (GWP), Green House Gas (GHG) emission and water usage as tools to present evidence of the problem (Takata et al., 2012; Liu et al., 2013; Vandermeersch et al., 2014; Eriksson et al., 2015; Reutter et al., 2017; Hall et al., 2009). For example, loss of food grain in China is 13.2%-24.8%, and it requires 95 billion m^3 of water to produce this amount of produce (Liu et al., 2013). This water footprint is virtually equal to the total volume of river flow and groundwater in Mozambique (World Bank, 2016). In the US, around one-quarter of freshwater used to produce food that is wasted (Hall et al., 2009).

In Europe, Scherhaufer et al. (2018) found that the GWP of FL and FW is accounted for 15-16% of the total impact of the entire food supply chain. Katajajuuri et al. (2014) highlighted that the environmental impact of household FW in Finland per year is as high as GHGs emitted by 100,000 cars. In Asia, according to Arunrat and

Pumijumnong (2017), the GWP of rice production in Thailand is equal to 3,090 kg CO_2 eq.ha^{-1}.$year^{-1}$. A high volume, as many as 600 million tonnes, of cereals is produced in South-East Asia (FAO, 2014b). If we can avoid producing food that would end up being wasted, we can prevent the emission of GHG which can damage our ozone. Moreover, we could also utilise land more efficiently. Yukalang et al. (2018) stated that if urban people in Thailand reduce or recycle organic waste (60% of which is FW), the government would no longer need the landfill dumping which causes problems such as environmental pollution (e.g., smell) and health related issues.

Therefore, the problem of FL and FW is significant. It is a waste of resources that could have been used sustainably for our well-being. Many countries around the world have been called for urgent action to mitigate global warming and climate change, as shown in Paris Agreement (UN, 2015), and prevention of FW can play an important role.

1.4.3 Society

Apart from the economic case and environmental sustainability, FAO (2019) emphasises the impact of FL and FW on food security and nutrition in our society. Food security has been a critical topic particularly within the past decade after food prices soared in 2008 (Pinstrup-Andersen and Watson II, 2011; Young, 2012). While there are people who are desperately in need of food, food is easily accessed, highly available, and affordable for some people such as the wealthy group (Young, 2012). According to World Health Organisation (WHO), while some people have too many nutrients per day, nearly half of a billion people in our world are underweight and 45% of our children under five years old die because of malnutrition (WHO, 2017). Thus, there is an imbalance of food access around the globe. Minimising FL and FW would be one of the works that require more attention because the leftovers could have fed the others (FAO, 2019). However, interestingly, FW reduction at the consumption level may create more food insecurity for producers due to lower food demand (FAO, 2019). In other words, farmers will be able to sell less produce if consumers save more food at home and have enough to consume.

Management of waste such as reducing FL and FW would therefore help increase the level of food security in our society. A waste management concept from prevention to disposal shown in the EU Waste Framework Directive (European Union, 2008) has been used as a framework for FW management by many organisations. The United States Environmental Protection Agency (2017b) or EPA prioritised six actions based

on their priority that can sustain the society, environment and economy (see Figure 4). Giving food to people in need has been shown as the second most prioritised approach after reducing food surplus at the producing sources in this waste management framework (United States Environmental Protection Agency, 2017b). Therefore, food waste prevention and minimisation would sustain the environment and improve our society.

While CFW prevention has been actively focused in developed countries, consumption patterns in developing countries are getting more similar to developed countries and should not be underestimated. FAO (2019) reported that there have been changes in eating habits due to growing incomes in emerging economies, demographic and cultural changes over the past decades. Developing countries are rapidly growing their population, adopting higher living standards as well as adopting food consumption trends typical of western countries (e.g. fast-food chains) which likely raise the level of CFW (Bagozzi et al., 2000; Pinstrup-Andersen and Watson II, 2011; Young, 2012; Pan et al., 2012; Aschemann-Witzel, Giménez, et al., 2018). There is a lack of empirical evidence to investigate the problem in developing countries. Therefore, there is a need to investigate the problem in the region particularly when being compared with developed countries in order for decision-makers to adapt and adopt relevant measures.

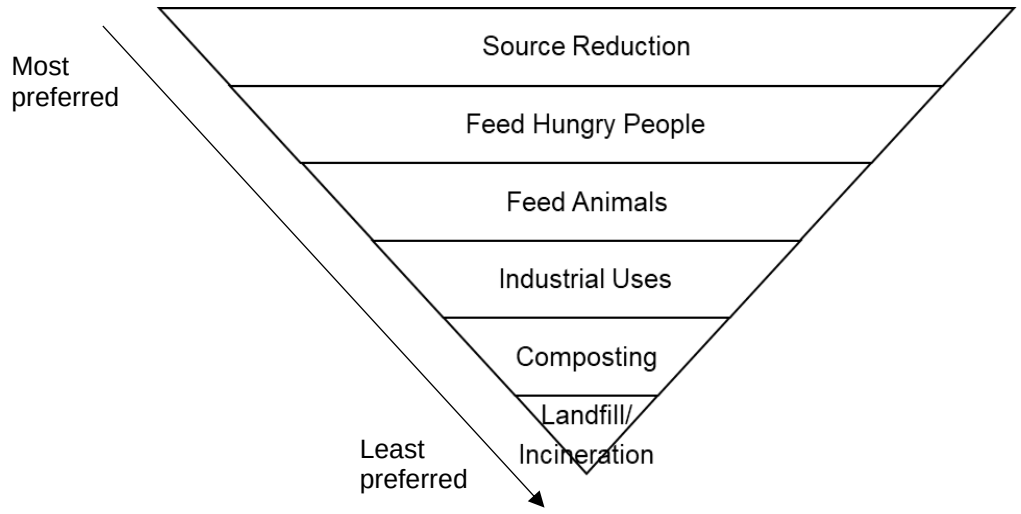


Figure 4 Recovery hierarchy for sustainable management of food and FW (United States Environmental Protection Agency, 2017b)

1.5 Motivation of the research

FW adds further challenges for our society to overcome, such as poverty, climate change (e.g. GHG emissions), imbalances of food supplies, municipal waste handling costs (FAO, 2011; Takata et al., 2012; Rutten, 2013; Reutter et al., 2017) and externality costs among proximity neighbours (Ahamed et al., 2016; Xiao and Siu, 2018). In addition to the classical view of increasing food supply, the unconventional view in the latest decade shows that there is a need to prevent food from being wasted at the consumption level in order to increase food availability (Buzby et al., 2014b). The topic of FW has gained a great deal of interest in developed countries (Parfitt et al., 2010; Hodges et al., 2011). By contrast, it is more about the FL situation at the production level that developing countries have been told to improve (Hodges et al., 2011; FAO, 2014b). This is mostly due to the estimates of FW in the FAO 2011 document are per capita which suggests the problem of FW in developed countries is more severe than in developing countries (FAO, 2011). However, there is a large number of population in developing countries (United Nations Population Division, 1999; World Bank, 2018a). Therefore, the magnitude of the problem in these nations should not be overlooked. In this respect, it is largely accepted by a number of governments and their agencies to seek FW reduction strategies (Rolle, 2014; APEC, 2014; Nikolaus et al., 2018) and to intervene at suitable points along the food supply chain (see Iacovidou et al. (2012) and Bellemare et al. (2017)).

From global estimates, FW occurred significantly at the consumption level in the US, the UK, and Europe (FAO, 2011; Buzby et al., 2014b)[6]. Despite a lack of quantitative data from developing countries due to the difficulties in measurement and accessibility of data on the consumption side (Quested, Marsh, et al., 2013; Dow, 2015; Soma and Lee, 2016; Aamir et al., 2018; FAO, 2019), global mission to find solutions to reduce FW has to move forward (Dow, 2015; FAO, 2019). In Thailand, the only available numeric data indicate that there are 27.8 million tonnes of municipal solid waste in 2018, which has increased 1.64% from the previous year because of the increase of population, consumption, urbanisation, and tourism promotion (Pollution Control Department, 2019). Around 60-64% of this waste is organic waste (Nikomborirak et al., 2019; Thanawat, 2019) and around 60% of percentage is FW (Yukalang et al., 2018).

[6] Committees in the 2019 FAO FL and FW report admitted that there is a lack of data for the FW in developing countries. The fact that the literature does not mention the significance of FW at the consumption level in some countries or regions does not mean the problem does not exist in those countries (Parfitt et al., 2010; FAO, 2019). The focus of the problem could be misled by this lack of data.

This figure only includes the waste that the government is responsible for. It has not included the garbage taken care of by private suppliers.[7]

Parfitt et al. (2010) pointed out that one of the key methods is that people need to change their behaviour. It is the top level of priority to investigate how consumer-specific factors influence consumer decisions that cause FW (Yu and Jaenicke, 2018). The decision to save or waste food could be framed as an economic decision depending on consumers' incentives, preferences, attitudes, habits and resource constraints (Ellison and Lusk, 2018). Thus, FW decisions can be considered as the outcome of a trade-off between various factors such as direct costs of FW (e.g. discarded food inputs) and costs of extra resources or efforts to avoid having FW (e.g. time spent going to the supermarket) (Clark and Manning, 2018). Yet, economic analyses providing empirical evidence of the impacts of potential FW, mitigation measures, costs and benefits, are scarce (Ellison and Lusk, 2018; Diaz-Ruiz et al., 2018). Recent studies, for example Diaz-Ruiz et al. (2018), Lorenz, Hartmann and Langen (2017), and Hebrok and Boks (2017), have shown that there is a need for more socioeconomic research to provide suggestions and recommendations to policymakers and other stakeholders about FW reduction strategies (Jensen and Teuber, 2018). Quested et al. (2011) and Scherhaufer et al. (2018) also pointed out that there is need to further investigate consumer behaviour that relates to FW in specific areas. This is due to the fact that CFW behaviour is complex and connected with other related behaviour such as cooking and shopping and requires in-depth information in order to gain more understanding about the behaviour (Quested et al., 2011).

Reusing leftover food has shown a great impact on FW reduction (Stefan et al., 2013; Secondi et al., 2015; Stancu et al., 2016). It is worth to highlight that saving leftover food does not mean the food will not be wasted. It is rather a concept of FW minimisation. FW from meals (plate waste) is another specific area which is also influenced by the behaviour of consumers and their decisions (Longo-Silva et al., 2013; Aschemann-Witzel, de Hooge, et al., 2018; Ellison and Lusk, 2018). For example, Ellison and Lusk (2018) pointed out that consumers could make different FW decisions

[7] The reported percentages were recorded by Thai governmental units. However, depending on each local areas around the country, there are trash that was handled locally and is not recorded such as by local people in a village in rural areas where the government service has not reached and therefore the amount of this waste is not recorded with the government data (Yukalang et al., 2018).

about meals at home versus out-of-home. FUSIONS[8] estimated that around 12% of food is wasted in the catering service sector in the EU (Tostivint et al., 2016). Katajajuuri et al. (2014) estimated that cooked food is 7%-28% wasted in Finnish food service sector which accounts for 75-85 million kilograms per year depending on types of restaurant. Although the attempt to quantify this type of FW in Asia is still in the initial stages (Wang et al., 2017; Aamir et al., 2018), FW from eating out behaviour in this region, particularly Thailand, is not to be underestimated because of the high availability of small-scale street food vendors (Bender, 2012; Khongtong et al., 2014) and the growing number of fast food chains which are becoming similar to developed countries due to urbanisation (Pinstrup-Andersen and Watson II, 2011; Young, 2012). This would increase the level of CFW in this part of the globe.

Previous studies have investigated CFW behaviour in a meal setting at the household level (Joerissen et al., 2015; Mallinson et al., 2016; Abeliotis et al., 2016; Richter and Bokelmann, 2017; Aschemann-Witzel, de Hooge, et al., 2018; Aschemann-Witzel et al., 2019). On the other hand, FW literature about the food service industry is more based on management of a restaurant and kitchen waste (BSR, 2013; Pirani and Arafat, 2016; Aamir et al., 2018; Filimonau et al., 2019). In other words, these studies were mainly based on FW as a result of their business decision not consumers. CFW behaviour in a restaurant setting has been understudied, particularly in developing countries. Despite a lack of research on CFW in Thailand and in developing countries, there has already been a campaign, “Save Food Asia-Pacific”, since 2013 to minimise and raise awareness of the FW problem in the Asia-Pacific region (FAO, 2012). In 2014, Asia-Pacific Economic Cooperation (APEC) developed “APEC Reduce Food Loss and Waste Action Plan” in order to improve food security in the Asia-Pacific region (APEC, 2014). There is a question of how successful the campaign could be when the understanding of CFW behaviour in the regions is still low.

Since FW reduction is a global campaign, decision makers and government bodies can learn from each other. For example, Thailand can learn from the Love Food Hate Waste campaign in the UK (WRAP, 2018a). However, Britz et al. (2014) emphasised that differences between regions should be taken into account in order to design a policy. A thorough search by the researcher of this thesis has revealed there is a lack of research studies which compare CFW behaviour and decision between developed and developing countries. Gaining insights into CFW behaviour from a comparison

[8] Food Use for Social Innovation by Optimising Waste Prevention Strategies which is an EU project in FW reduction (EU FUSIONS, 2016)

would provide policymakers with more specific characteristics of people at whom the campaigns are targeted, to develop policy and promote activities of CFW reduction (Diaz-Ruiz et al., 2018). To fill this void, we investigated and compared CFW decisions in a meal setting particularly when there are leftovers. We conducted in-depth interview in Thailand first because of a lack of information from the country. Then, we conducted an online survey using the experimental vignette methodology (VE) in the United Kingdom and Thailand. Finally, focus group discussion (FGD) in both countries was conducted in order to gain in-depth understanding of CFW behaviour and their decisions in relation to saving leftover food. Our first contribution to the literature is to systematically determine how the decisions to save leftover food were affected by social, economic, and practical factors such as the presence/absence of other people during eating, place of eating, cost of the meal, amount of leftover food, and future meal planning. Last, we compared CFW decisions between developed and developing countries.

1.6 The rationale behind the comparison between the UK and Thailand

We compare CFW behaviour between British and Thai consumers to discover factors driven their behaviour which could be similar or different. This comparison would hopefully provide information for decision-makers to learn from each country, inspire relevant sectors to solve FW problem, and eventually help each other to tackle the problem.

The current food market and logistics in this century are linked globally beyond one country's border (Pinstrup-Andersen and Watson II, 2011; FAO, 2019). The existence or changes of economic players' behaviour in one country (e.g. consumers' behaviour) could influence how other players (e.g. government bodies or manufacturers) in other countries react (Rutten, 2013). Public policies, measures, and economic agendas within a food supply chain such as FW reduction, plastic usage minimisation, or nutritional-related policies, therefore, also involve multinational parties more than in the previous centuries (APEC, 2014; Thyberg and Tonjes, 2016).

There have been much information and many projects about FW in the UK and other developed countries (see Quested, Ingle, et al. (2013), (Soma and Lee, 2016) and Roodhuyzen et al. (2017)). Notably, the UK has enriched data relevant with FW and CFW matters (Quested et al., 2011; Iacovidou et al., 2012; Quested, Ingle, et al., 2013; Nikomborirak et al., 2019). They can be examples from which other countries to learn.

For example, Australia and New Zealand are adopting the UK Love Food Hate Waste campaign (Commonwealth of Australia, 2017; Love Food Hate Waste NZ, 2020). On the other hand, there has been a lack of data and public movement about this matter in developing countries such as Thailand while FAO has already started to urge Thailand to tackle the problem (FAO, 2014b; Rolle, 2014; Soma and Lee, 2016; FAO, 2019). Discovering CFW behaviour of people in one developing country, i.e., Thailand in this context, to fill this gap could provide researchers and readers insights about CFW behaviour in that country. However, policies about FW reduction involving the encouragement of consumer behaviour changes have rather been discussed at the international level in order to solve the problem in a broad picture (see FAO (2011)).

Additionally, the policies or methods used to eliminate some problems in developing countries are often adopted from those policies implemented in developed countries. According to Srisuwannaket and Liumpetch (2019), leading researchers about FW from Thailand Development Research Institute (TDRI), “waste sorting and recycling system in Thailand is neither well planned nor efficient. There is a need for the country to look at alternative methods implemented overseas to manage FW and FL”. Moreover, because there is a lack of experience in this agenda among Thai researchers and government units, Thailand is obtaining assistance and collaborations from international researchers particularly from European countries (Mungkung and Busch, 2017; GIZ, 2018). Results from studies of consumer behaviour by comparing between countries provide societies with differences and similarities of different groups of people. The findings will shed light on how to achieve the goal of CFW reduction and how to adapt policies in each country to suit the people’s behaviour the best. Researcher and working groups from abroad would understand more about Thai CFW behaviour in order to suggest any further FW reduction strategies. In the century when people’s behaviour, attitudes, and norms changed rapidly, having this information in hands would enable policy makers, government body, or campaigners to response to those changes quicker than having less knowledge about it. In this regard, we compare consumers from two countries, the UK and Thailand to gain more insights about their CFW behaviour.

1.6.1 Cross-cultural comparison: Individualism VS Collectivism

Policymakers and public movement in one country are often inspired by what is being done or has been done in other countries and, therefore, compare themselves with the

others in order to adopt policies (Pinstrup-Andersen and Watson II, 2011; FAO, 2014b). In terms of FL and FW reduction, Thailand, among other S&SEA countries, has shown its interests in this issue and FAO movement for CFW reduction in the country has gained more attention from the Thai government and people (FAO, 2014b; Rolle, 2014). Researchers and decision-makers in Thailand have been looking at countries like the UK and countries in Europe in order to learn from them (Nikomborirak et al., 2019). However, people and culture are different. Adopting policies and management technologies should be done carefully because CFW behaviour in different regions could be driven by different sets of drivers (Benyam et al., 2018). Therefore, comparing between groups of people about CFW behaviour (e.g. between Thai and British consumers) would enable us to change or design CFW policies accordingly to suit each group or culture.

From the traditional view about “culture” at the country level, Thailand is considered as a collectivist country, whereas the UK is an individualistic country (Hofstede et al., 2010). People from collectivist and individualist communities were assumed to behave and think differently and have a different set of attitudes about group’s or self-benefits (Singelis et al., 1995; Triandis and Gelfand, 1998; Sivadas et al., 2008; Edirisingha et al., 2015). While an individualist person may be more independent emotionally and physically, a collectivist person may rely on other people in their network more than the former and would prioritise group’s benefits (Sinha et al., 2002). Research evidence has shown that some consumers care about their societies and not wasting food (e.g., it is a waste of resources or it damages the environment) while this is not important for some consumers because they perceive this matter as a personal issue (Stancu et al., 2016; Qi and Roe, 2016). The difference concerns show elements of individualism and collectivism. Decision-makers could design a policy to minimise the problem of CFW based on characteristics of people in a country while being aware that policies from abroad can be adapt to be suitable with a specific culture. The policy design requires a greater understanding of the target population of the policy (Pierce et al., 2014).

1.7 Aim, objectives, and research questions of the thesis

The main aim of this thesis is to discover CFW behaviour in meal settings by comparing developed and developing countries. We also aim to give empirical evidence of British

and Thai people CFW behaviour. Specifically, we aim to achieve three specific objectives:

1. To identify factors affecting CFW behaviour in meal settings.

    RQ. 1.1: What factors affect CFW behaviour in meal settings?

2. To compare CFW behaviour in meal settings between a developed country (the UK) and a developing country (Thailand).

    RQ. 2.1: What are the similarities in CFW behaviour between British and Thai consumers?

    RQ. 2.2: What are the differences in CFW behaviour between British and Thai consumers?

3. To discover consumers' in-depth experience, expectations, and opinions about CFW behaviour in meal settings.

    RQ. 3.1: What are in-depth reasons and motivations that explain CFW behaviour in meal settings?

    RQ. 3.2: Are reasons and motivations about CFW behaviour different between British and Thai consumers?

1.8 Contributions

This thesis hopes to contribute to an on-going discussion about CFW by providing empirical evidence about CFW behaviour of British and Thai consumers. First, there is a lack of data and research studies about FW in the context of developing countries, whereas there has been more pressure from communities around the globe to reduce FW. Therefore, results from this thesis hope to fill this gap. Second, looking at FW mitigation policies implemented in one country could be a good starting point for other countries to adopt. However, since consumers are culturally different, such as in terms of collectivism or individualism, the policies may need to be adapted to suit consumer's behaviour in specific cultures or countries. The comparison of CFW behaviour between consumers in the UK and Thailand in this thesis will highlight differences and similarities of people from both counties, their behaviour, and factors affecting their FW decisions. Therefore, it aims to provide useful information for decision-makers or policymakers in both the UK and Thailand about CFW decisions and behaviour.

1.9 Outline of the thesis

In addition to Chapter 1 Introduction, this thesis consists of five other chapters. Chapter 2 presents results from a literature review based on FW and CFW behaviour focusing on drivers. After that, the conceptual framework is outlined. Chapter 3 touches upon acquisition of qualitative data as empirical background knowledge in the context of Thailand. Chapter 4 is a study based on quantitative analysis in finding factors affecting CFW behaviour, comparing between Thailand and the UK. Chapter 5 presents a qualitative explanation from the consumer's point of view to clarify the quantitative results from Chapter 4. Chapter 6 discusses the main findings of the thesis. The implications of the results from this thesis are presented particularly for policymakers or decision-makers to utilise. At the end of this thesis, we explain the limitations of our research and recommend directions for future studies.

Chapter 2
Consumer Food Waste Behaviour: A Review

2.1 Introduction

The analysis of literature regarding CFW focusing on drivers of behaviour will be presented in this chapter. The body of literature on FW at the consumption stage has been collected electronically from key databases such as the Web of Science, ScienceDirect, CABI: CAB Abstracts and Global Health, AgEcon Search, Business Source Complete, and Scopus. The selected materials include peer-reviewed articles in academic journals and conference reports in English. The keywords were “consumer”, “food waste”, “consumer food waste”, “household”, “consumption”, “eating”, “leftovers, “food”, and “waste” which were researched in the title and the abstract. The three boundaries of the search were established. First, this review captured FW from the consumer’s point of view. This means that the focus was on FW occurring at the consumption level, e.g., home and out-of-home settings. Second, the categories for the materials were the environment, agriculture, economics, social sciences, psychology, management, and consumer behaviour. Third, the years of publication were from 2008 to 2019. After the elimination of repeated items, a total of 186 peer-reviewed articles, papers, and conference reports were selected for further review based on their abstract. After further screening, 55 studies investigating factors or determinants on FW behaviour at the consumption level were included in the review.

2.2 Conceptual framework of consumer food waste behaviour

CFW behaviour is a complex system (FAO, 2011; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015; Stancu et al., 2016). Therefore, it is not straightforward to use a lens from one field of study to look at this problem and should not be attributed to a single factor (Secondi et al., 2015; Schanes et al., 2018). In other words, it would be more helpful to investigate CFW behaviour based on multidimensional areas such as psychology, food science, marketing and the environment. This is because a lack of diversity from relying on one aspect will fail to capture the various drivers of consumer food choice (Furst et al., 1996; Köster, 2009).

This research will draw upon a combination of multidisciplinary factors by Köster (2009) and a FW framework by Roodhuyzen et al. (2017).

One dominant group of researchers (e.g., Stefan et al. (2013), Graham-Rowe et al. (2015), and Stancu et al. (2016)), relied on the Theory of Planned Behaviour (TPB) by Ajzen (1991) as a conceptual framework. The TPB focuses on “intention” as a predictor of behaviour and is influenced by attitudes, norms, and beliefs (Ajzen, 1991). However, this psychological construct is not adequate in providing insights into the impacts of other factors, such as knowledge or skills (Farr-Wharton et al., 2014) or food attributes (Köster, 2009). Armitage and Conner (2001) and Köster (2009) pointed out that the TPB is not sufficient to fully understand consumer food behaviour. Block et al. (2016) added that TPB only captures the influence of behaviour based on conscious awareness, whereas CFW behaviour also involves “unintended behaviour” and subconsciousness. For example, Stefan et al. (2013), pointed out that there was no significant influence of consumer intention on consumer behaviour to prevent FW. Graham-Rowe et al. (2015), therefore, predicted FW reduction behaviour by adding other indicators to the TPB model (e.g. moral norm and anticipated regret). Still, the significance of non-psychological factors such as food attributes (e.g., cost or taste) have not been taken into account. On the other hand, concepts in food sciences, sensory science, and consumer behaviour consider these factors but lack the insights of the social sciences and psychology (Köster, 2009; Tuorila and Monteleone, 2009). The food sciences and sensory field focuses on investigating food properties and the roles of sensory perception more than the effects of the sensory attributes on consumer behaviour (Köster, 2009).

Factors from a range of disciplines need to be taken into account in order to be able to understand CFW (Furst et al., 1996; Köster, 2009). Figure 5 shows the conceptual framework of CFW behaviour consisting of five main factors; personal, product, behavioural, situational, and socio-cultural. This diagram was initially identified by Köster (2009) who laid out factors of consumer food choice from interconnected areas of studies and was adapted to comply with the concept of FW based on Roodhuyzen et al. (2017). This overview accommodates multidisciplinary drivers to explain consumer behaviour in eating and drinking rather than focusing on a linear direction from a single perspective. However, looking at broad aspects like this might not enable a detailed examination of the causes and effects of one factor.

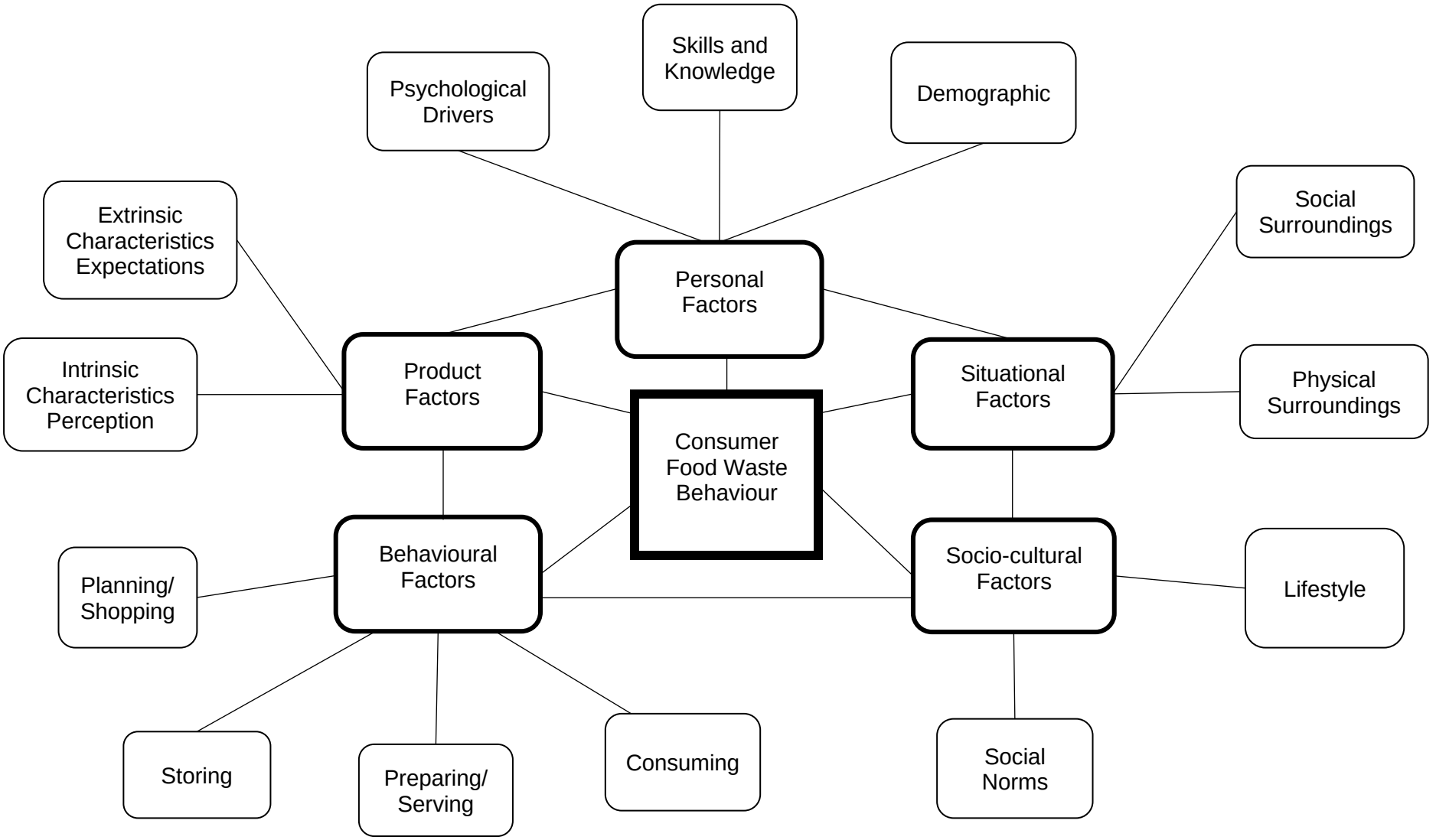


Figure 5 Conceptual framework of consumer food waste drivers (adapted from Köster (2009) and Roodhuyzen et al. (2017))

2.3 Drivers of consumer food waste behaviour

In order to gain an understanding of CFW behaviour, factors that drive consumer behaviour are key (Furst et al., 1996; Köster, 2009; Stancu et al., 2016). One main reason for this is that policymakers, stakeholders, and government bodies can utilise the information for their future works on FW prevention measures (Ishangulyyev et al., 2019). The discussion is based on a systematic literature review. The five key drivers will be presented in this order; 1) personal factors, 2) socio-cultural factors, 3) food-related behavioural factors, 4) situational factors, and 5) product characteristics.

2.3.1 Personal Factors

Personal factors are sometimes called internal drivers. They derive from demographic characteristics, skills and knowledge, and psychological factors (Köster, 2009; Solomon, 2015; Hebrok and Boks, 2017). For example, young people who lack food handling knowledge, are from a high-income family, and are not aware of FW problems might produce more FW than older consumers from a lower income group who may have better knowledge on how to prepare a meal and handle leftover food (Quested, Marsh, et al., 2013; Fonseca, 2013; Mallinson et al., 2016).

2.3.1.1 Demographics

At an individual level, demographic characteristics are important factors influencing FW decisions. Thyberg and Tonjes (2016) and Ellison and Lusk (2018) emphasised that the demographic characteristics of people significantly influence CFW behaviour. The main socio-demographic drivers which will be presented are age, gender, household characteristics, income, education, areas of residence, physical conditions, and diet preference.

Age

Age is an important factor affecting CFW behaviour. However, different studies show different outcomes. Some found that older people waste food less than younger consumers (Fonseca, 2013; Stefan et al., 2013; Quested, Marsh, et al., 2013; Secondi et al., 2015; Lazell, 2016; Mallinson et al., 2016; Stancu et al., 2016; Tucker and Farrelly, 2016) because the former have more skills, knowledge and experience such as reusing leftover food and correctly storing food to prolong shelf-life (Quested,

Marsh, et al., 2013). They may also be aware of the environmental consequences of wasting food (Tucker and Farrelly, 2016). Younger consumers such as university students, however, are likely to waste more food because of mismanagement and a lack of food knowledge (Fonseca, 2013; Lazell, 2016; Ghinea et al., 2019). They may have limited experience in controlling a food budget and stock (Lazell, 2016), they may often go shopping without a plan, or they may buy promotional food products in higher volume (Fonseca, 2013; Ghinea et al., 2019). Previous studies found that the latter behaviour may lead to FW. One explanation for the possibility of bulk-buying resulting in FW is the difficulty for the purchaser to finish the food they have stocked up on before the expiry dates shown on the food label (Ghinea et al., 2019).

In contrast, another group of research studies showed that it was old people who wasted more food because they were pickier in their food choices, resulting in wasting the food they do not prefer (Delley and Brunner, 2017; Rohm et al., 2017; Aschemann-Witzel, 2018). Rohm et al. (2017) and Aschemann-Witzel (2018) found that young people were willing to consume and buy less “perfect” food more than older people. Those foods might have a lower quality than normal (e.g., food products that have a few days left before the ‘best before’ date or products which may have cosmetic defects) and would otherwise potentially end up as discarded products (de Hooge et al., 2017). Thus, consumer willingness to consume “ugly” food can also help to reduce FW. While most of the literature points out that young consumers are a predominant group of FW producers, it seems that older people also produce a lot of FW resulting from their food choices. Nonetheless, there is evidence showing that CFW behaviour has no significant difference between age groups. (Neff et al., 2015; Richter and Bokelmann, 2017; Russell et al., 2017). Moreover, Aschemann-Witzel et al. (2019) found an unclear effect of age on FW depending on situations. In Uruguay, while younger people would be more likely to waste food than older people, the older people would likely offer too much food in social dining situations to show generosity to their guests resulting in more FW (Aschemann-Witzel et al., 2019).

Gender

Both women and men can be key FW producers. Other related issues such as their roles in a household also have an impact on CFW. However, if we look into, for example, a specific country or a local area, we might be able to find differences in trends in CFW behaviour between male and female consumers.

As is the case with age, numerous scholars have found contradictory findings on the effect of gender on CFW. First, CFW behaviour is different between male and female (Koivupuro et al., 2012; Fonseca, 2013; Neff et al., 2015; Secondi et al., 2015; Mallinson et al., 2016; Delley and Brunner, 2017; Lorenz, Hartmann and Langen, 2017; Aschemann-Witzel, 2018; Ellison and Lusk, 2018). Second, gender is not an influential driver of CFW behaviour (Principato et al., 2015; Richter and Bokelmann, 2017; Russell et al., 2017).

Among the first group, some studies indicate that women have a higher tendency to be a main food waster when compared with men (Koivupuro et al., 2012; Mallinson et al., 2016; Lorenz, Hartmann and Langen, 2017). Koivupuro et al. (2012) conducted a large-scale questionnaire survey and considered participants' FW diaries among 380 households. It was found that if a woman was a leading person in food shopping, the amount of FW was considerably more than that of a family in which a man or both a man and a woman took this responsibility. Moreover, single women wasted food more than single men (Koivupuro et al., 2012). Mallinson et al. (2016) also found the same trend among 928 young UK citizens. Most FW contributors were women who lived with at least two other people who are difficult to please (Mallinson et al., 2016). The rationale behind could be that because these women wanted to be seen as a "good" food provider for their family by serving an abundance of food, this resulted in an excessive amount of food and FW (Graham-Rowe et al., 2014). Additionally, Lorenz, Hartmann and Langen (2017) found that female German students left food on their plates more than male friends because the portion size was perceived as too large for them. This perception could be influenced by the size of serving plates - a visual factor that triggers the different perception of food amount (Wansink and van Ittersum, 2013). Another possible reason could be a difference in physical conditions, e.g., body size, between men and women (Krassner et al., 1979).

By contrast, women in some studies (e.g., from Portugal, Switzerland, and the US) wasted less than men (Fonseca, 2013; Secondi et al., 2015; Delley and Brunner, 2017; Ellison and Lusk, 2018). According to Fonseca (2013) and Secondi et al. (2015), consumers, who were not aware of a FW problem, were mostly men and also did not like to separate kitchen waste. Delley and Brunner (2017) also described a group of male respondents in Switzerland who were highly educated and living in urban areas but had a low level of awareness about FW. Therefore, food was wasted more, particularly among male consumers who were not aware of the level of FW they generated (Fonseca, 2013; Secondi et al., 2015). However, Ellison and Lusk (2018)

argue that even though women tended to waste less than men in general, this depended on places of consumption and the conditions of the food. The amount of CFW might also vary according to skills in food preparation (Ellison and Lusk, 2018). Therefore, Principato et al. (2015), Richter and Bokelmann (2017), and Russell et al. (2017) point out that gender was not a significant determinant of CFW behaviour.

Household

There are two main patterns of CFW behaviour depending on the different household characteristics; there can be either a negative or a positive relationship between the number of household occupants and the amount of FW. However, most of the works carried out have a lack of clarity regarding a comparison between a different number of household members within the same income group.

Following the discussion about gender, household characteristics, e.g., a family or a single-person household, are also an underlying factor for CFW behaviour. Different attributes of the household could show different CFW behaviour. Studies from large (Koivupuro et al., 2012; Mallinson et al., 2016; Tucker and Farrelly, 2016) and small (Richter and Bokelmann, 2017) scale surveys show that household size has a positive relationship with the amount of FW. Specifically, Tucker and Farrelly (2016) highlight that the proportion of CFW increased with the increased numbers of young family members aged under 18 years old which is contradict with Aschemann-Witzel et al. (2019) who found no effect of this factor on the likelihood of having FW. Richter and Bokelmann (2017) conducted a small-scale survey among 25 German households and found that families with high food expenditures wasted more food than a household of a single person.

However, some studies argued that a household of a single person created more FW (Fonseca, 2013; Joerissen et al., 2015; Priefer et al., 2016). A literature review of FW drivers in Europe by Priefer et al. (2016) has shown that higher levels of single person households result in a higher level of CFW. There is empirical evidence to back this argument in Portugal (Fonseca, 2013), Italy and Germany (Joerissen et al., 2015). Fonseca (2013) surveyed 542 Portuguese people and conducted an in-depth interview with 18 individuals. It was found that single Portuguese male households were the main FW contributors. Joerissen et al. (2015) used an online platform to investigate CFW behaviour of 857 Italian and German scientists. The paper shows the smaller the number of household members, the more FW per capita, particularly among the high-

income group. Clark and Manning (2018) explained that cooking as a family as opposed to cooking for oneself allows better management and utilisation of food. Thus, a family can minimise the amount of FW more efficiently than an individual.

There might be similar patterns of CFW behaviour among people who have similar income regardless of the number of family members. This will be discussed in the next section.

Income

Income has gained much attention as a significant CFW driver (FAO, 2011; Buzby and Hyman, 2012; Buzby et al., 2014a). At the consumer level, there is a conflict in the research about which income group of consumers is a primary FW producer. Much of the literature argues that there is a positive relationship between income and the volume of FW (Parfitt et al., 2010; Stefan et al., 2013; Tokareva and Eglite, 2014; Neff et al., 2015; Joerissen et al., 2015; Ellison and Lusk, 2018). By contrast, there is also evidence showing that lower-income consumers waste a lot of food (Porpino et al., 2015; Setti et al., 2016). The majority of the research studies presented here provide evidence that high-income household waste more food than the lower-income group. However, this will also depend on how the income level is reported; whether it is a household or an individual income.

For the former group of research studies, income appears to be positively related to CFW behaviour (Stefan et al., 2013; Tokareva and Eglite, 2014; Neff et al., 2015; Ellison and Lusk, 2018). Indeed, an investigation into drivers of CFW among 610 Latvian consumers by Tokareva and Eglite (2014) shows that the high-income households cared less about the cost of wasting food. On the other hand, low-income households wasted less food because they were concerned about the cost (Tokareva and Eglite, 2014). Neff et al. (2015) focused on an individual level of income and pointed out that low-income people wasted less food. According to Connell et al. (2016), low-income families in their study in the US were trying to reduce the amount of household FW to save their food expenses. Qi and Roe (2016) surveyed in the US as well and argued that rich people wasted food because of risk aversion to foodborne illness rather than monetary value. This behaviour might be explained by Lusk and Ellison (2017) who stated that the opportunity cost of time for high-income consumers was higher than the cost of keeping and preparing food. Therefore, they would simply throw away food instead of spending time on handling food. While these studies

showed a higher likelihood of CFW behaviour among high-income consumers, they ignored other groups of people who have no fixed income such as students who are financially supported by their family. These consumers might have different patterns of CFW behaviour.

In contrast to the previous results, Setti et al. (2016) investigated the relationship between consumer's income and CFW behaviour for five food categories; bread, cheese, yoghurt, and fresh fruits and vegetables among 1,403 Italian consumers. They argued that people who wasted more food were those from lower- and middle-income groups. This was because they often purchased a large amount of lower quality and cheap food products (Setti et al., 2016) and these products tend to cause FW in a lower income group. One possible explanation for this could be because of the product's high availability and lower prices for some food types such as bread (Rutten, 2013). Some consumers may prefer to buy fresher food and may throw away the old one they have kept because the food may be no longer fresh (Mallinson et al., 2016). Moreover, Porpino et al. (2015) conducted qualitative research with 14 lower- and middle-income households in Brazil. The results show that these families wanted to be perceived as "wealthy" by other people. Therefore, their CFW behaviour was discarding leftover foods, consuming only fresh meals, excessive purchasing, and providing an abundance of food for their family (Porpino et al., 2015).

Education

A few studies have investigated the effect of education on CFW behaviour and found that more highly educated people waste more food (Secondi et al., 2015; Delley and Brunner, 2017). Secondi et al. (2015) investigated the correlation between the level of education and the level of FW in a large-scale study covering 27 European countries[9]. The results show that the higher the education level, the higher the likelihood that these people will waste food. This relationship was also found among 681 Swiss residents in Delley and Brunner (2017). However, in the US, Ellison and Lusk (2018) found that people without a degree from a college and older than 65 years old are likely to throw away more of their leftover meal. This shows contradictory evidence from Secondi et al. (2015) and Delley and Brunner (2017). These educated consumers might have more knowledge about food such as about best before date or how to preserve food

[9] EU-27 countries are Hungary, UK, Ireland, Sweden, Slovakia, Portugal, Denmark, Romania, Latvia, Luxembourg, Greece, Germany, Spain, Finland, Poland, France, The Netherlands, Bulgaria, Malta, Cyprus, Slovenia, Italy, Estonia, Austria, Lithuania, Czech Republic, and Belgium

and therefore waste less as also shown in Abeliotis et al. (2014). They provided evidence that there was less confusion among educated people about food labelling. Therefore, they could save more food, especially products with a shelf-life date (Abeliotis et al., 2014). Nonetheless, it is questionable if the educational effect on CFW simply relates to the income level.

Areas of residence

Another socio-demographic characteristic that affects CFW behaviour is the place where consumers live. Surprisingly, there are only a few research studies investigating this issue (e.g., Secondi et al. (2015), Canali et al. (2017), and Chakona and Shackleton (2017)). One of the main findings from these studies suggests that people who live in the city or an urban area generated more FW than others. An alternative interpretation of this factor can be found in Delley and Brunner (2017). In Switzerland, women, who lived alone in the countryside, were among those who generated the lowest amount of FW. A systematic review of the literature on drivers of FW highlighted that economic growth and urbanisation are among the crucial factors that contribute to FW issues. However, Tucker and Farrelly (2016) point out that examination of CFW situations in less-developed areas or rural areas should be investigated more because of a lack of inclusion in the research.

Physical conditions and diet preference

There is a current paucity of studies investigating the relationship between CFW behaviour and consumer physical conditions or diet preferences. Very few studies explored specific types of food (e.g., organic or vegan) as well as biological factors. For example, one might assume people who are thin might not be able to consume as much as overweight consumers, and that they might therefore generate a greater amount of FW (Robinson and Hardman, 2016). Krassner et al. (1979) and Robinson and Hardman (2016) found a positive correlation between BMI (body mass index) and the ability to finish a meal. Block et al. (2016) stated that consumer food choice concerning FW behaviour also depended on personal goals to control the amount of food intake. Only one study in Australia, conducted by McCarthy and Liu (2017), reported FW attitudes and CFW behaviour among consumers who preferred organic or vegetarian food products. When compared to consumers with no particular preferences, these people who have special dietary requirements contributed a higher

volume of FW (McCarthy and Liu, 2017). This may be because there are more conditions for their choices (Hoek et al., 2004) or it may be due to the demographic characteristics of the organic enthusiasts. People who usually buy organic food products are likely to be highly educated, have higher disposable income, have children at home, and are older than other types of consumers (Xie et al., 2015; Sultan et al., 2018). The evidence presented in earlier sections supports that these are characteristics of main FW generators.

2.3.1.2 Skills and Knowledge

Consumer skills and knowledge about food, food handling, and preservation can affect CFW behaviour (Quested, Marsh, et al., 2013; Farr-Wharton et al., 2014; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Jenny, 2015; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015; Lazell, 2016; Priefer et al., 2016; Lusk and Ellison, 2017; Aschemann-Witzel et al., 2019). Specifically, cooking skills and food storing knowledge had a negative correlation with the amount of CFW (Mallinson et al., 2016; Delley and Brunner, 2017; Rohm et al., 2017). In the UK, Quested, Marsh, et al. (2013) mentioned that consumers who know about appropriate portioning for rice and pasta and who have knowledge about food shelf-life are able to minimise FW. According to the FAO statistical database of FL and FW by FAO (2011), approximately 25% of cereal is wasted at the consumption stage in the EU, and it is the most significant volume of FW compared to other food categories. Reducing cereal waste in households would, therefore, significantly reduce the level of FW in the EU. The impact of food knowledge on CFW is also shown in empirical studies in the UK (Mallinson et al., 2016), in Switzerland (Delley and Brunner, 2017), other western European countries (Rohm et al., 2017), Brazil (Porpino et al., 2015), and Australia (Farr-Wharton et al., 2014). Porpino et al. (2015) added that food spoils early if it is not prepared or kept under suitable conditions because of lack of knowledge. Food knowledge also includes knowing stock level and where food is kept at home to avoid food being thrown away (Farr-Wharton et al., 2014). Therefore, having skills and knowledge about food will help to minimise domestic FW. However, Joerissen et al. (2015) investigated consumers who are scientists and argued a contradictory point. Cooking skills had less influence on CFW than other factors such as food storage and intrinsic characteristics of the food (e.g., smell and taste). The participants in their study might share a similar level of food knowledge and, therefore, its impact on CFW behaviour was not significantly different.

Even though food literacy is an essential influencer of CFW behaviour, this could conflict with a consumer's unfavourable experience. Farr-Wharton et al. (2014) mentioned that, regardless of consumer food knowledge, they would be reluctant to consume food of which the date has passed because of risk perception such as foodborne illness. All in all, much literature and many empirical works have shown that food knowledge and skills are essential determinants of CFW. However, its impact could be outweighed by other factors such as consumer preference of specific food attributes or risk aversion.

2.3.1.3 Psychological Drivers

At the consumption level, there is a growing body of literature that recognises a set of psychological constructs as crucial determinants of CFW behaviour. Over the past decade, most research in CFW has emphasised the significance of consumer awareness regarding FW problem such as Fonseca (2013), Stefan et al. (2013), Graham-Rowe et al. (2014), Porpino et al. (2015), Canali et al. (2017), and Diaz-Ruiz et al. (2018). Moreover, research in this area has used the Theory of Planned Behaviour (TPB) by Ajzen (1991) as a lens to determine CFW behaviour which is assumed to be driven by an intention to reduce FW (Graham-Rowe et al., 2015; Stancu et al., 2016). In this model (see Figure 6), the behaviour is a consequence of individual intention, and there are three main factors that influence the intention; attitudes, perceived behavioural control (PBC), and subjective norms (Ajzen, 1991). Since normative perception is discussed as part of the socio-cultural factors, norms will be presented in the next section 2.3.2.1 Social norms and perception of others' expectation. Therefore, the main variables found in the literature that will be discussed here are intention, attitudes, PBC, awareness and concerns about FW.

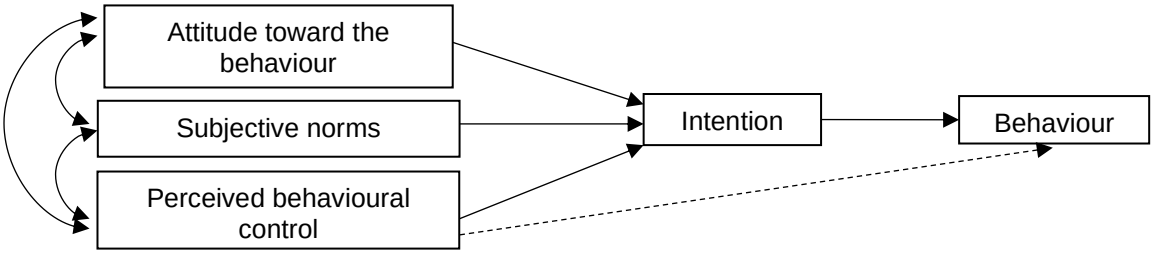


Figure 6: The Theory of Planned Behaviour Model (modified from Ajzen (1991))

According to Ajzen (1991), attitude toward the behaviour is the individual's perception of the behaviour and whether it is pleasant to perform the behaviour whereas

subjective norms refer to the perception of others' opinion. The behaviour is also based on the level of the perceived difficulty in performing an action (PBC) (Ajzen, 1991). The target behaviour is performed if the intention is strong. Fishbein and Ajzen (1975) argued that attitude is a function of a person's beliefs about the object and implicit evaluation results associated with the belief he or she has.

Intention, attitudes, and perceived behavioural control

There is a large number of research studies examining the relationship between people's intentions and CFW behaviour that relies on TPB (Stefan et al., 2013; Graham-Rowe et al., 2015; Russell et al., 2017; Lorenz, Hartmann and Langen, 2017; Lorenz, Hartmann, Hirsch, et al., 2017). Both Graham-Rowe et al. (2015) and Russell et al. (2017) conducted a survey in the UK. They found that if an individual intended to reduce FW, they would significantly behave in a way that would reduce the amount of FW. Lorenz, Hartmann and Langen (2017) and Lorenz, Hartmann, Hirsch, et al. (2017) also investigated a similar relationship in Germany. The results show that a strong intention not to leave food in a canteen resulted in a significantly lower amount of plate waste.

By contrast, Stefan et al. (2013), who conducted a survey with 244 Romanian consumers, found no significant influence of intention on consumer's reported amount of FW. While researchers attempted to evaluate the impact of consumer intention on CFW under the TPB framework, Block et al. (2016) claimed that the TPB is insufficient to explain the CFW behaviour (see section 2.2 for this discussion of CFW framework). Graham-Rowe et al. (2015) highlighted that the variance of explaining the intention as a predictor of CFW is increased by adding other CFW drivers which are not shown in the TPB model. Therefore, some scholars have included more variables into the TPB model such as personal norms (Lorenz, Hartmann, Hirsch, et al., 2017), negative emotions, habits (Russell et al., 2017), and food-related behaviour (Qi and Roe, 2016). Moreover, Stancu et al. (2016) argued that "intention is not a good predictor of FW behaviour and self-reporting of FW is often biased".

When considering the significance of factors affecting intention and particularly those that are highly based on TPB, few studies stated that attitudes, perceived difficulty in reducing waste, and norms drive the intention to reduce FW or to finish all food (Graham-Rowe et al., 2015; Lorenz, Hartmann and Langen, 2017). However, Russell et al. (2017) found that only PBC and subjective norms had a positive effect on the

intention to reduce FW. In their study, other factors from the theory of interpersonal behaviour, a model of comprehensive environmental behaviour and emotion were added into the TPB model. Additionally, if the scenario of the survey was a negative statement (e.g., intention not to waste food), contradictory results were found in Stancu et al. (2016) and Lorenz, Hartmann, Hirsch, et al. (2017). The survey results from 1,062 Danish consumers who show no significant contribution of PBC and moral norms on the intention not to waste food (Stancu et al., 2016). From a smaller scale survey (156 respondents), Lorenz, Hartmann, Hirsch, et al. (2017) also highlighted that subjective norms and PBC had a lesser effect on consumer's intention not to leave food on their plate in a catering environment. Stefan et al. (2013) pointed out that the way researchers design their survey questions has a crucial impact on the results. Therefore, careful and specific identification of "intention" and "behaviour" is necessary.

Studies about attitudes toward FW in western countries have been conducted by using both qualitative and quantitative methods (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Jenny, 2015). Qi and Roe (2016) identified three main categories of attitudes towards household FW by American consumers; perceived benefits from saving food, perceived difficulty in reducing FW, and guilt. In Russell et al. (2017), guilt was considered as a negative attitude and had a direct positive impact on CFW behaviour. Koivupuro et al. (2012) pointed out that consumers who thought they could reduce more FW were those who significantly wasted more than others. On the other hand, there were consumers who find it difficult to reduce FW because they have already thrown away a little amount of food. Therefore, it is arguable if the actual behaviour of CFW, particularly in a quantitative sense, could be explained by those psychological constructs.

Awareness and concerns about FW

Awareness is another key driver of CFW (Tokareva and Eglite, 2014; Principato et al., 2015; Qi and Roe, 2016; Delley and Brunner, 2017). The minimisation of CFW could be enhanced by raising the awareness of the problem and media could be an influential source of information (Principato et al., 2015). There is evidence showing that consumers with different levels of FW awareness behave differently. Tokareva and Eglite (2014), Principato et al. (2015), Qi and Roe (2016) and Delley and Brunner (2017) highlighted the point that consumers tend to waste less food if they view FW as

an economic problem rather than an environmental problem. Therefore, they saved food to save money (Delley and Brunner, 2017). In other words, this monetary value motivates consumers to generate a lower amount of FW. Fonseca (2013) found a slightly different outcome among 542 people in Portugal. People, who generated a low level of FW, were aware that FW was an environmental problem (e.g., contributes to global warming). However, this study did not investigate other aspects of the awareness, such as the economic impact of FW.

On the other hand, some consumers would not waste less food even if there was an effort in raising the awareness of FW problem by policymakers (Principato et al., 2015; Clark and Manning, 2018). Secondi et al. (2015) stated that awareness about the FW problem and its impact on the economy and the environment in various countries across Europe is low. The awareness of the majority of students in Clark and Manning (2018) (UK) and Principato et al. (2015) (Italy) showed that food packaging was more harmful to the environment than the FW. Therefore, Canali et al. (2017) pointed out that lack of awareness is one of the central problems of FW in Europe and needs governmental interventions. Tokareva and Eglite (2014) suggested that consumers in Latvia should be informed more about FW problems and how saving food can help them to save money. Principato et al. (2015) stated that students in Italy are aware of the FW problem from television programmes. Therefore, the media can be a crucial source in raising consumer awareness.

2.3.2 Socio-cultural Factors

Previous studies suggest that social and cultural factors have an impact on CFW behaviour in terms of normative beliefs in society and changes of the consumer lifestyle (Porpino et al., 2015; Secondi et al., 2015; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015; Thyberg and Tonjes, 2016; Roodhuyzen et al., 2017; Hebrok and Boks, 2017; Canali et al., 2017).

2.3.2.1 Social norms and perception of others' expectation

Social norms refer to people's behaviours that meet social expectations and are perceived as "normal" by society (Elster, 1989; Hechter and Opp, 2001; Sun et al., 2014). Descriptive norms are a perceived behaviour in a society whereas injunctive norms are what one ought to do or not to do (Elster, 1989; Ajzen, 1991; Casson, 1997; Brennan et al., 2013) which is similar to the subjective norm in TPB by Ajzen (1991).

A person behaves to comply with social norms in order to fit into a group and to avoid punishment (e.g. feeling guilty) but that behaviour might not converge with attitudes or personal normative attitudes (Elster, 1989). For example, consumers might not like the idea of organic products (i.e., attitudes) but will be willing to buy them because these products are socially approved as environmentally friendly by others (i.e., social norms) (Loebnitz et al., 2015).

Some previous studies have attempted to evaluate the impact of social pressure on CFW. Delley and Brunner (2017) stated that social norms and their influence on CFW could distinguish between those people who waste less and those who generate more FW. Qualitative research conducted by Farr-Wharton et al. (2014) in Australia, Graham-Rowe et al. (2014) in the UK, and Aschemann-Witzel et al. (2019) with Uruguayan respondents shows that consumers were willing to comply with norms. This was reflected in their attitude that an individual providing an abundance of food would be perceived as a “good” host.

It was found in Qi and Roe (2016) that social norms drive CFW, particularly among an Asian group of participants in a study conducted in the US. However, it was not confirmed which types of norms were playing an important role. Some other studies found that injunctive norms (Stancu et al., 2016) and moral norms (e.g., feeling guilt when wasting food) (Stefan et al., 2013) had a significant influence on a consumer’s intention not to waste food. In the UK, Graham-Rowe et al. (2015) and Russell et al. (2017) highlighted that subjective norms had a positive relationship with the intention to reduce food waste. However, Graham-Rowe et al. (2015) did not find significant impact from descriptive norms. This might be because there is a lack of transparency about how much other people waste (Quested, Marsh, et al., 2013). Among students in Germany, personal norms affect attitudes about FW which in turn influence intention to prevent leftover food (Lorenz, Hartmann, Hirsch, et al., 2017). This means this group of German students wasted or did not waste food based on their own opinion rather than others’ opinions.

Cultural dimensions could explain these different levels of norm impact between societies (Hofstede et al., 2010). Individualism-Collectivism is an explanation used by Hofstede et al. (2010) to describe a community. There are different patterns of norms among individualist societies (e.g., the US and the UK) and collectivist societies (e.g., Japan, China, and Thailand). Behaviour of people in the collectivist culture is motivated by group norms more than in the individualist society (Brewer and Gardner, 1996). The

relationship between family members in the collectivist community is more close-knit (Hofstede et al., 2010). According to Hemar-Nicolas et al. (2013), food consumption patterns are constructed and guided, starting from a family level. Therefore, there is a potential that social norms regarding CFW would play a more important role in this type of culture which is highly represented by Asian countries (Hofstede et al., 2010).

2.3.2.2 Lifestyle and emergence of convenience products

Change of lifestyle has a great impact on food consumption (Parfitt et al., 2010; Young, 2012). Few published studies have examined the consequences of consumerism and urban lifestyle, resulting in CFW (Mallinson et al., 2016; Delley and Brunner, 2017). FW experts in Europe pointed out that the culture of consumerism is another critical area to examine in more detail in an attempt to mitigate FW problems (Canali et al., 2014; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015). Secondi et al. (2015) highlighted that the effect of urbanisation is a key societal driver to CFW. More convenient food and shops are available in the cities, and people have less opportunity to interact with food production activities at the agricultural level (Ellison and Lusk, 2018; Lazell, 2016). Therefore, consumers waste food easily because they are not aware about difficulties in food production (Lazell, 2016).

Having a convenient lifestyle, including a preference for ready-to-eat food and owning a microwave, has a positive relationship with CFW behaviour and there is empirical evidence for this from a study conducted in Switzerland by Delley and Brunner (2017). The consumerist, 14.1% of their participants, were described as those who generated the highest amount of FW and often shopped at a convenience store. People who wasted more food, in a survey conducted in the UK by Mallinson et al. (2016), reported their preference for convenient food (e.g., ready-to-eat food). It was the group of consumers that most likely had a microwave which was opposite to those who wasted the least. Modernisation and CFW also involve time constraint in daily life. Lazell (2016) reported that people feel the pressure from lack of time when dining in a canteen, and therefore they sometimes had to leave food on their plates.

2.3.3 Food-related behavioural factors

Thus far, we have seen that personal factors and lifestyle drive CFW behaviours. However, food-related habits are another large group of factors that causes CFW (Parfitt et al., 2010; Quested, Marsh, et al., 2013; Roodhuyzen et al., 2017). Recent

evidence shows that behavioural factors from acquiring, storing, preparing, and consuming food correlated with why consumers generate FW (Canali et al., 2014; Canali et al., 2017; Delley and Brunner, 2017; Hebrok and Boks, 2017; Russell et al., 2017; Diaz-Ruiz et al., 2018). In European countries, Secondi et al. (2015) and Diaz-Ruiz et al. (2018) highlighted the observation that habits of citizens in dealing with household waste and FW can significantly determine the amount of FW. An extensive review of the literature by Priefer et al. (2016) shows that a lack of food planning, buying too much of food, poor food storage management and leftover handling had an impact on CFW (Priefer et al., 2016). These behaviours and their effects on CFW behaviour will be discussed in the following sections.

2.3.3.1 Food planning and shopping pattern

According to the Food Recovery Hierarchy by the United States Environmental Protection Agency (2017b), reducing FW from the beginning of the food source is highly prioritised. For consumers, this could mean preventing FW at the food acquisition point. Many recent studies (e.g., Fonseca (2013), Stefan et al. (2013), Stancu et al. (2016), and Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer (2015)) have shown that food planning and shopping patterns are significant drivers of CFW behaviour. Understanding these factors would, therefore, show who the main FW contributors are.

Making a shopping list is a simple yet effective method of CFW minimisation (Quested, Marsh, et al., 2013; Ponis et al., 2017). Planning food purchases allows people to manage food stock more effectively (Beretta et al., 2013; Koivupuro et al., 2012; Stefan et al., 2013; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015). However, experts in CFW pointed out that consumers are less likely to plan for their food shopping (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015). From empirical studies, it was also found that people, who were primary food waste contributors, were those who did not like to make a shopping list (Fonseca, 2013; Tokareva and Eglite, 2014; Clark and Manning, 2018; Diaz-Ruiz et al., 2018), and did not plan ahead for their meal (Tokareva and Eglite, 2014; Mallinson et al., 2016). However, even though there is a list, some might fail to stick with the plan.

Shopping patterns, overstock, spontaneous purchase, and place of food shopping are the top primary reasons for CFW. Results from an in-depth study among low-income families in Porpino et al. (2015) and household food diaries in Richter and Bokelmann

(2017) show that purchasing too much and accumulating excessive food stock were the most important causes of FW. Ponis et al. (2017) investigated the effects of the shopping habits on CFW by using a questionnaire survey. It was found that having no shopping list and making an impulsive purchase had a positive relationship with preparing and serving a large portion of food, and this significantly affected the level of FW. It is believed that this method helps them to budget because of, for example, the lower prices per unit and the fewer shopping trips (Porpino et al., 2015; Setti et al., 2016). Buying large quantities and stocking up on food might be encouraged by shop offers, e.g., promotional discount.

Consumers who buy discount products might be the kind of consumer who wants to save their budget and therefore does not want to waste food (Connell et al., 2016; Delley and Brunner, 2017). Evidence can be found in Finland by Koivupuro et al. (2012). It was found that consumers who were not interested in buying discount food produced more waste food than those who were enthusiastic about it. By contrast, in the UK, findings from Mallinson et al. (2016) contradict this and show that those who were influenced by promotional products wasted the most (7.6% of their purchased food products). Delley and Brunner (2017) pointed out that price-driven consumers prefer quantity to quality. Consequently, excessive food is wasted. However, this depends on the places where the consumers acquire the food.

Recent studies in CFW behaviour have determined its relationship with places of food shopping rather than distances to the food place. Results from a survey carried out in Italy and Germany by Joerissen et al. (2015) show that consumers who only shopped at a large-scale supermarket wasted approximately 140-160 grams of food per week, per person. This might be because consumers need to make more effort to go to the supermarket and they therefore tend to buy too much in contrast to a local shop that allows people to top-up their food stock more conveniently. However, Fonseca (2013) and Delley and Brunner (2017), surveyed Portuguese and Swiss consumers, respectively, and found different outcomes. People who preferred to purchase food from local shops and convenient shops tended to produce a considerable amount of FW. This evidence suggests that if food is easily acquired, it is wasted more often. In terms of shopping frequency, Richter and Bokelmann (2017) found that the number of times consumers do food shopping per week had no significant influence on CFW. Nonetheless, most of these studies fail to investigate the relationship between distances to food sources and CFW behaviour. Moreover, they have ignored people who grow their food or only buy primary ingredients to process food. Therefore, CFW

behaviour of members in some societies, e.g., growers, might be different from those who cannot produce their food.

2.3.3.2 Storing

There are two main scenarios related to food storing practices, resulting in FW. First, people keep food in a fridge or a freezer for too long. Second, food is stored in inappropriate conditions that shorten its shelf-life.

There is a chance that an individual may forget what food they have already and they may leave it in the fridge or freezer for a long time (Joerissen et al., 2015; Lanfranchi et al., 2016; McCarthy and Liu, 2017; Soma, 2019). Consequently, these people either excessively build up their food stock (Farr-Wharton et al., 2014) or keep food until it is out of date (Joerissen et al., 2015). Priefer et al. (2016) and Richter and Bokelmann (2017) point out that poor and careless food storage practices can profoundly influence CFW. Delley and Brunner (2017) added that consumers who produced the most FW had a lack of food storing knowledge. Quested, Marsh, et al. (2013) stated that freezing was an effective method of prolonging food shelf-life and can prevent domestic FW. Janssen et al. (2017) argued that if consumers were encouraged to freeze more of their food, a significant amount of FW could be prevented. The government should inform consumers about the benefits of a freezer and food knowledge, e.g., types of food that can be frozen (Quested, Marsh, et al., 2013; Parfitt et al., 2010). The possession of a freezer could also determine this CFW behaviour. Clark and Manning (2018) found that without owning a freezer or having limited space in a freezer, students in the UK were likely to contribute more to levels of FW. Therefore, despite knowing how food should be kept for a more extended shelf-life, a lack of kitchen equipment can also affect CFW.

2.3.3.3 Preparing and serving

Consumers create a significant amount of FW because of their habits and behaviour in preparing or serving food. This could be an impact of food handling as well as an contextual factor during preparing and serving food (Nicolas, 1995; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015; Canali et al., 2017; Ponis et al., 2017).

Richter and Bokelmann (2017) studied causes of domestic FW using a household food diary. Preparation of fruits and vegetables is the stage where the highest amount of

CFW took place (Richter and Bokelmann, 2017). It was found that a great deal of food was wasted because it was cooked too much or because it was not consumed before the food spoiled (Porpino et al., 2015; Clark and Manning, 2018). Apart from cooking too much, serving oversized portions is another main factor for CFW. It was found by Ponis et al. (2017) that serving portion size has a direct effect on FW. Lorenz, Hartmann and Langen (2017) conducted a survey of 343 students in a university canteen. It was highlighted that consumers who "perceived" that the portion size was small would be likely to leave less food on their plates. This perception factor is also significant when people serve themselves in a buffet (Wansink and van Ittersum, 2013; Birisci and McGarvey, 2018). These studies suggested that if consumers cook and serve food in reasonably sized portions for them to be able to finish, FW could be prevented.

A contextual factor, such as a plate size and a portion size, is one of the psychological explanations for FW. Wansink and van Ittersum (2013) found that amount of food consumed and FW are related to the perceived amount of served food. This effect is associated with plate size used in a meal. In their experiment, people who served themselves with a bigger plate wasted 135% more food than consumers who used a smaller plate (Wansink and van Ittersum, 2013). This similar pattern is also found in Sharp (2016). Plate dimension influences people's judgement about how much food they have been served and how much they will be likely to consume (Sharp, 2016). Therefore, crockery size might deceive people and consumers do not realise how much they can or should eat.

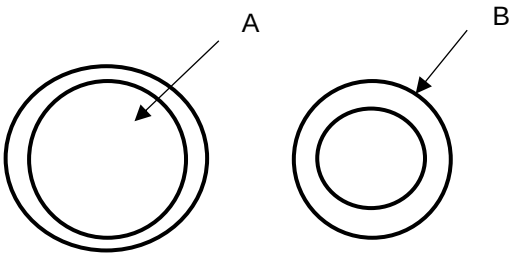


Figure 7 Example of the Delboeuf illusion[10] showing A has the same size as B but could be perceived as bigger (modified from Nicolas (1995))

[10] Ring A and ring B have the same size but ring A could be perceived bigger than ring B.

This phenomenon is explained by the concept of the Delboeuf illusion which identifies how difficult it is to accurately judge the size of shapes when they are in different positions (see Figure 7) (Nicolas, 1995). As a result, the amount consumers believe they can eat for one meal could vary depending on plate size. Thus, this could be another factor contributing to FW.

2.3.3.4 Consuming

FW is directly affected by consumer food choice or eating preference (Ponis et al., 2017). This has a relationship with product attributes which will be presented in section 2.3.5. In general, consumers waste food in this stage because they have no desire for food or they prefer food which is fresher than the leftovers (Fonseca, 2013; Porpino et al., 2015; Principato et al., 2015; McCarthy and Liu, 2017; Clark and Manning, 2018). Results from studies among students in the UK show that this is the main reason for CFW (Lazell, 2016; Clark and Manning, 2018). This preference is also shown among general consumers who would prefer to consume freshly prepared food rather than food that was left from previous meals (Fonseca, 2013; Farr-Wharton et al., 2014; Porpino et al., 2015; Delley and Brunner, 2017).

Delley and Brunner (2017) added that a group of consumers who wasted the most significant amount of FW always left the leftover food until the food was spoiled because these people preferred to eat out and did not usually cook . Ponis et al. (2017) found that people who ate out or ordered food from elsewhere to eat at home wasted a greater amount of food than those who cooked for themselves. A group of primary CFW contributors in Fonseca (2013) even discarded all that was left from a meal, or they would give the leftover food to their pets. Porpino et al. (2015) point out that giving the leftover to the pets was not perceived as waste by their Brazilian respondents.

On the other hand, another group of studies found that some consumers are not encouraged to take leftover food home when eating out because of the inconvenience of carrying the leftovers, embarrassment to ask for food to be wrapped, or the fact that they have already paid for that food and would as well leave it at the restaurant (Shimmura and Takenaka, 2010; Leung, 2015; Wang et al., 2016; Bozzola et al., 2017; Sirieix et al., 2017; Andrews et al., 2018; Mirosa, Liu, et al., 2018). Culture may play an important role in this behaviour. In Indonesia, not only leftover food is saved, but it is also given to other people as a gift, for example, from the owner of the house to their housemaids (Soma, 2017).

In addition, discarding the leftover food allows the risk-averse consumers to avoid the possibility of consuming spoiled food (Principato et al., 2015). However, Farr-Wharton et al. (2014) argued that low willingness to consume leftover food has a lower impact on CFW than other factors such as food knowledge. This could be related to the fact that people with a higher level of food knowledge are more aware that leftover food is still edible and therefore they will still want to eat.

2.3.4 Situational factors

Situational factors refer to both social and physical surroundings during food and drink consumption. In the context of CFW, social surroundings involve the presence of others and physical surroundings refers to places of consumption. Köster (2009) pointed out that these factors are another main driver of consumer food choice. However, few research studies in FW have investigated these drivers and, this is, therefore, another area of CFW drivers that could be explored further in the literature.

2.3.4.1 Social surroundings

Social setting, such as having friends for a meal, can be another factor for CFW. People like to be a good host and provider for their guests (Farr-Wharton et al., 2014; Graham-Rowe et al., 2014; Wang et al., 2017; Aschemann-Witzel et al., 2019) and may consequently prepare extra food which will not be eaten. Empirical results from qualitative research in Australia by Farr-Wharton et al. (2014) also show that consumers might have to change their food plan by discarding their leftover food in order to eat out with friends or family members. The act of caring about significant others by providing fresher and more abundant food has a contrary effect on CFW reduction (Graham-Rowe et al., 2014; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Jenny, 2015). Therefore, many more factors need to be considered (e.g. social factors) when a FW choice is made involving multiple individuals. Thus, different expectations from different people in different situations have an impact on CFW.

2.3.4.2 Physical surroundings

The impact of physical surroundings on CFW varies depending on where the consumption is taking place. For meal consumption, Ponis et al. (2017) found that people who prepared their meals at home generated less FW than those who preferred eating out in a restaurant or takeaway food to eat at home. Consumers who cook for

themselves may be able to visualise how food is produced better than others, can see the value of it, and therefore would not want to waste it (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015). Ellison and Lusk (2018) explained that consumers discount their time for cooking and therefore would like to save or finish as much food as they can. There are more elements to explore regarding these physical surroundings and FW during the consumption process such as the atmosphere of dining either at home or in a restaurant. It is also questionable if consumers waste more food when dining out if dining out is a more common activity (i.e., routine lifestyle) than eating at home in some societies. There is a lack of evidence to support this, but it could be an area for future research.

2.3.5 Product characteristics

There are two main aspects of product attributes when consumers make choices - intrinsic and extrinsic. Köster (2009) points out that consumers perceive quality from the intrinsic and extrinsic product characteristics. “Intrinsic cues refer to physical properties of the product, whereas extrinsic cues refer to everything else” (Olson (1972), cited in Grunert (2005), p. 736). These two factors have a critical impact on CFW since food characteristics play a central role in this topic.

2.3.5.1 Intrinsic characteristics

Intrinsic characteristics, such as nutritional properties and organoleptic attributes of food products, (Köster, 2009; Asioli et al., 2017) have a significant impact on consumer food choice and CFW (Canali et al., 2017; Hebrok and Boks, 2017; Grunert, 2005). Freshness might be a general term that consumers use to describe what they prefer in food and food that is not perceived as fresh is likely to be wasted (Principato et al., 2015; Lazell, 2016). In detail, consumers choose not to consume food that has insufficient perceived sensory quality such as having a suboptimal appearance (e.g., cosmetic defects) or low palatability (Tokareva and Eglite, 2014; Joerissen et al., 2015; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Jenny, 2015; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015; Richter and Bokelmann, 2017). This not only occurs at home but also in food stores (de Hooge et al., 2017; Rohm et al., 2017; Aschemann-Witzel, 2018).

Appearance is the most important aspect from which food quality is implied (Meilgaard et al., 2007). Therefore, when compared to other intrinsic characteristics of food,

appearance is the top-rated reason why consumers waste food (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Jenny, 2015; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015; Lazell, 2016; Canali et al., 2017; Rohm et al., 2017). In a study that compared German, Dutch, and Norwegian consumers, de Hooge et al. (2017) found that people in Germany had the lowest level of willingness to consume products with cosmetic defects. de Hooge et al. (2017) pointed out that people were more willing to consume products that have a suboptimal appearance at home than they were willing to purchase them from a supermarket. Bananas have been used as experimental units to determine the relationship between food appearance and CFW. Consumers prefer to consume bananas with bright yellow skin or with less than 40% of brown skin (Nannyonga et al., 2016; Neff et al., 2015). Cucumber and yoghurt were examples of two products that consumers would consume even though the appearance was imperfect. Improving the appearance of food could encourage consumers to generate less FW, particularly among children (Connell et al., 2016).

Apart from appearance, taste, and smell are other intrinsic (i.e., sensory) characteristics that drive CFW (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015). For example, Latvian consumers often judged the quality of food and whether it was suitable for consumption by its smell when it was close to the date informed on the label (Tokareva and Eglite, 2014). Joerissen et al. (2015) reported that “bad” smell and taste would put Italian consumers off and thus food would definitely be discarded. In a canteen, a meal with “good” taste would significantly determine a low amount of plate waste in Germany both among students (Lorenz, Hartmann and Langen, 2017) and company employees (Lorenz, Hartmann, Hirsch, et al., 2017). This was found to be more significant for CFW in dairy products such as milk (Neff et al., 2015; Ellison and Lusk, 2018). Freshness or the smell of the milk is a key attribute that influences consumers to throw it out or not (Neff et al., 2015; Lusk and Ellison, 2017).

2.3.5.2 Extrinsic characteristics

Extrinsic characteristics of food products refer to attributes of a product which are not an inherent quality of food (Köster, 2009) such as packaging or labelling (Asioli et al., 2017). Much of the current literature on FW at the consumption stage pays particular attention to food packaging and date labels (Williams and Wikstrom, 2011; Williams et

al., 2012; Silvenius et al., 2014; Verghese et al., 2015; Wikström et al., 2016; Wilson et al., 2017). There are only a few published studies that have investigated food price as a determinant of CFW in details. This discussion will be presented in this section.

Packaging

One of the roles of food packaging is to keep food fresh for a longer period and this is a key factor that prevents CFW (Tokareva and Eglite, 2014; Almli et al., 2018). Citizens from the UK who are good at saving food recommend helpful food packaging tools such as a plastic zip bags suitable for freezing to minimise FW (Quested, Ingle, et al., 2013; WRAP, 2017b). Williams et al. (2008) point out that packaging design can help mitigate the problem of FL, and thus reduce the environmental impact. Almli et al. (2018) highlight that adding information such as shelf-life extension functionality of the food packaging on its label would play may help CFW reduction in Norway. However, food packaging can also have a negative influence that can, in turn, increase the amount of FW. From the Swedish consumer's perspective, food packaging can create an obstacle to consumption and overly-large packages of food or multipack formats were found to be main factors contributing to FW (Williams et al., 2012). This complies with results from a study of Finnish consumers. Indeed, Koivupuro et al. (2012) reported that CFW had a positive correlation with the purchase of food which is packaged to be sold in bulk in Finland. One explanation could be that the food cannot be finished before the stated date on the label because of the larger amount that has been bought (Koivupuro et al., 2012; Williams et al., 2012).

Date label

Date labelling, such as expiry date or best before date, has created much confusion and they have been discussed widely in the literature (Williams et al., 2012; Tokareva and Eglite, 2014; Priefer et al., 2016; McCarthy and Liu, 2017; Rohm et al., 2017; Richter and Bokelmann, 2017; Wilson et al., 2017).

Shelf-life date with 'Use by' importantly indicates a safety point of time for perishable food products such as dairy and meat products, and food may not be safe to consume after the stated date (Shaw, 2014, p.163). 'Sell by' and 'best before' refer to food products (e.g., bread, snacks, and canned food) of which consumers can expect a decrease in quality such as loss of taste or texture if consumed after these dates (Shaw, 2014, p.163). To emphasise the role of these two date labels, people can still

consume the food even though the date has passed. Rather, the ‘sell by’ date labelling is more for helping retailers and shop staff to know when to take that food off shelves (Food Safety and Inspection Service, 2016). In other words, the ‘use by’ date is for safety purposes, whereas the ‘best before’ date is for quality purposes.

Consumers tend to waste food when the date on its label has passed (Joerissen et al., 2015; Neff et al., 2015; Block et al., 2016; McCarthy and Liu, 2017). However, it was found that people who were informed about the meaning of each label created a smaller amount of FW (Abeliotis et al., 2014; Clark and Manning, 2018). Williams et al. (2012) reported that consumers who were better informed would also waste less food as they would know that although a shelf-life date had passed, the food would still be edible. However, people who have had unfavourable health experiences with spoiled food are much less hesitant to discard food which has passed the ‘sell by’ date (Farr-Wharton et al., 2014; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015; Qi and Roe, 2016). Farr-Wharton et al. (2014) and Qi and Roe (2016) highlighted that many people are very careful about trying to avoid foodborne diseases and therefore they feel more comfortable about throwing out food according to the date labelling regardless of the edibility of the food itself. Therefore, a food label has a significant impact on CFW.

Food price

The price of food is a cost for consumers to consider when they are wasting the food. To prevent CFW at a food retailing source, price discounting is often used as a tool (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015; de Hooge et al., 2017; Rohm et al., 2017). Koivupuro et al. (2012) and Joerissen et al. (2015) found that people who tended to waste food were not attracted by discounted food. This could be because people who care about wasting less food also care about the money they spend and therefore buy the cheaper options (Connell et al., 2016; Daniel, 2016). Time in preparing food is also counted as a cost which influences consumer food choice in discarding the leftover food (Ellison and Lusk, 2018).

Lusk and Ellison (2017) and Ellison and Lusk (2018) used a household production function based on a theory of allocation of time by Becker (1965) to explain that the market price of food material, and other factors such as wage rate, are key factors that affect domestic FW. However, the study did not consider consumers who are less likely to cook by themselves and who tend to eat out more (Canali et al., 2014; Aschemann-

Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015). Lusk and Ellison (2017) stated that the likelihood of saving food was higher in a home setting than in a restaurant setting because of the opportunity cost in food preparation by consumers. However, this study did not include other costs of making a trip to a restaurant and the opportunity cost for the time spent on travelling and waiting for food to be served. Shannon and Christian (2017) investigated food mobility in detail in the US and found that most people travelled by car for approximately 7 km when dining out, which was nearly two-fold from an average distance to a grocery store. This shows that there are other costs related to CFW when considering out-of-home dining.

Regarding specific food commodities, Clark and Manning (2018) found that students in the UK wasted fruits and vegetables the most at home. Those consumers claimed that these raw materials were cheap products, and it was convenient for them to refill the stock easily at any time (Clark and Manning, 2018). Moreover, there is evidence that shows a positive correlation between food price and intrinsic quality of food with FW. Setti et al. (2016) pointed out that cheaper products usually had lower quality regarding organoleptic attributes, particularly when people buy them in large pack sizes. Therefore, consumers who have a limited budget and likely to buy inexpensive food may then generate more waste because of the intrinsic characteristics. While both de Hooge et al. (2017) and Rohm et al. (2017) reported that food price was a driver to prevent CFW at the retailing stage, Principato et al. (2015) found that food cost had no impact on the effort to reduce FW among Italian students. This might be because they have already generated a low level of FW. It was also found out that people who contributed a more considerable extent of CFW are more willing to change their CFW behaviour (Principato et al., 2015).

2.4 Policies about food waste and consumer food waste

There have been multiple policies and initiatives set up to minimise the problems of FW in countries around the globe. They involve many sectors, such as governments, NGOs, and businesses, and consumers. This section will highlight those movements focusing on the UK and Thailand, and briefly about other countries, respectively.

2.4.1 Policies in the UK

The UK has shown a strong will in solving the problem of FW, and many organisations have firmly put FW reduction in their agendas. Their major aims are for a sustainable

economy and to lower the amount of FW being ended up in a landfill to reduce GHG such as methane (Government Office for Science, 2017). There are policies and campaigns which the country has been working on in order to achieve this (WRAP, 2017a; Quested, Ingle, et al., 2013; WRAP, 2018a). As mentioned in a document from the UK Government Office for Science, the problem of FW needs more than one intervention to change CFW behaviour (Government Office for Science, 2017). Therefore, there are a few organisations supported by the UK government raising campaigns and creating policies about FW reduction.

WRAP is a leading organisation in the UK, supported by the government, promoting FW reduction policies as well as conducting various studies about this problem. It provides consumers with information about how to manage food and reduce FW and save food (Quested, Marsh, et al., 2013). The campaign focuses on offering consumers with simple solutions such as showing leftover food recipes and food preservation techniques on its website, social media, and local cooking clubs (Love Food Hate Waste, 2015; WRAP, 2018a).

In 2018, the UK government funded eight charities across the country under the Government's £500,000 Food Waste Reduction Fund (WRAP, 2018b). Those charities are Action Homeless, His Church, FareShare Yorkshire, Feedback Global, Food in Community, Nuneaton & Bedworth Healthy Living Network, and REfUSE Durham (WRAP, 2018b). The grants were spent on redistributing food, that otherwise be wasted in shops or household, to people in need.

Moreover, many local councils in the UK (e.g., Oxford City Council, Cheshire East, Dover District Bristol City Council, and Northern Ireland) provide FW bins for each household to recycle FW (nidirect, n.d.; WRAP, n.d.; Government Office for Science, 2017). As part of this FW bin policy, these local government offices also raise consumer awareness about the FW problem, educates consumers about food (e.g. date labelling), and they can manage FW in the area more efficiently. After the collection, the household FW will be made into compost for use in agricultural activities (Cheshire East Council, n.d.).

Food catering and hospitality is another business sector which has been emphasised by the UK government and NGOs to reduce kitchen waste and plate waste (WRAP, 2013). The Hospitality and Food Service Agreement (HaFSA) was developed by WRAP funded by all UK governments (WRAP, 2017c). It was launched in 2012 for a 3-year long project to develop actions by foodservice providers such as reviewing food

ingredient stocks, offering various portion sizes for diners to choose, and encouraging staff to offer doggy bags (WRAP, 2017c; BHA, 2015). The British and Hospitality Association (BHA) is another stakeholder who supports the HaFS agreement and works with waste management companies to help BHA's members managing waste more efficiently alongside the FW reduction actions mentioned above (BHA, 2015). In hospitals and schools, the UK government has recently been working with the NHS Estates and Facilities Team to set standards for portion sizes and leftover food take-home service (HM Government, 2018). Therefore, in the catering sector, ingredient stock management, portion sizes, and leftovers are keys for FW reduction measures in the UK.

2.4.2 Policies in Thailand

FW mitigation is a rather novel concept in Thailand. This topic has gained attention in less than a decade from Thai authorities, activists, and consumers (PATA, 2018; Srisuwannaket and Liumpetch, 2019). Therefore, there are significantly fewer data about FW policies in Thailand, particularly when compared with the UK. Among a few, Thai governments, NGOs, and business sectors such as Thailand Development Research Institute (TDRI), Pacific Asia Travel Association Sustainability & Social Responsibility Department (PATA) and Tesco Lotus are those who have started to promote FW agenda in Thailand (PATA, 2018; GIZ, 2018).

In 2015, the Royal Thai government together with FAO appeared to be interested in promoting FL and FW reduction by launching the Save Food Campaign in Bangkok (Save Food Asia-Pacific, 2016; FAO, 2014b). The campaign's main activity is to raise awareness about FL and FW in Thailand by conveying messages about how much food is lost worldwide and emphasising the point about difficulties farmers are facing in order to produce food for everyone, and therefore food should not be wasted (Dow, 2015). During the campaign launching event, there are walk-through displays for these messages and Thai celebrities involvements to gain attention from the public (Dow, 2015). There seems to be no follow up events or activities on this topic and campaign. In 2017, one of the projects from Thailand-European Union Policy Dialogues Support Facility was about FL and FW mitigation in response to the UN SDG 12 (Mungkung and Busch, 2017). Although FL and FW have been raised as a national flagship project, Thai researchers and government bodies have focused mainly on the agricultural

sector to prevent postharvest losses and focused less about CFW. This emphasises that there is a lack of movements in Thailand regarding CFW policies.

In the retail sector, Tesco Lotus in Thailand has been a pioneer in FW minimisation since 2017 by adopting the FW policy initiated by Tesco in the UK (Thailand - European Union Policy Dialogues Support Facility, 2017; GIZ, 2018; Tesco PLC, 2020). Surprisingly, it was this business organisation who invited the Thai government, NGOs, academics, decision-makers in Thailand to learn more about their "Target, Measure, Act" framework. In the past three years, their main approach has been to donate or redistribute food that is still fit for human consumption to charities and people in need (Tesco PLC, 2020). In 2020, they have 19% less of food surplus in their supermarkets when compared with 2019 (Tesco PLC, 2020).

2.4.3 Policies in other countries

The European Commission (EC) launched a circular economy concept in 2015 for EU global competitive mission while restoring the EU natural resources (European Commission, 2019). FW reduction is part of the "Circular Economy Action Plan" strategies not only to enhance the EU economy but also in response to achieving the UN goals (UN, 2016; European Commission, 2019). In 2018, the EC revised its Waste Framework Directive calling EU countries to reduce FW throughout the food supply chain. The measure requires EU countries to plan FW reduction programme, support food donation, redistribute food for human consumption, and educate consumers about shelf-life labels (e.g. use-by date or best before date) (European Commission, 2020).

France and Italy are among leading countries in Europe who have been actively fighting against FW. Since 2016, supermarkets in France have been required to donate unsold food fit for human consumption that otherwise would be wasted to authorised non-profitable organisations (EU FUSIONS, 2016; Vaqué, 2017). The supermarkets will face a €3,750 (approximately £2,900) fine if they fail to comply (Vaqué, 2017). Similarly, there are laws in Italy that force food retailers to donate surplus food to charities. However, instead of sanction, positive reinforcement is implemented in Italy – waste tax reduction with more food they donate (Vaqué, 2017; Lemos, 2019).

In the US, the federal government has also been putting effort to halve the amount of FW by 2030 (United States Environmental Protection Agency, 2017b). Led by EPA and USDA, various stakeholders, including business sectors, local government units,

and non-profit organisations have identified vital actions aiming to achieve their goal of FW reduction. Those activities involve adopting Food Recovery Hierarchy (see Figure 4), increasing FW awareness, redistributing food to those in need, providing knowledge about shelf-life labels, and investing more in technologies about FW recovery (United States Environmental Protection Agency, 2017a). In addition, food service providers in the US also suggested that they could incentivise their guests or clients and improve their stock management to prevent FW (United States Environmental Protection Agency, 2017a).

In Australia, there are not many differences of the FW reduction orientation from the UK, EU, and the US. They are prioritising four main actions which are establishing FW-related legislations, improving business sectors (e.g. using more technologies), developing market (e.g. encouraging innovation), and changing behaviour of consumers and business staff (Commonwealth of Australia, 2017). In the Australian private sector, some companies are also providing the FW mitigation solutions such as Peats Soil who collects FW from hotels, restaurants, and schools to produce compost (Commonwealth of Australia, 2017). Both Australia and New Zealand are adopting the Love Food Hate Waste campaign from the UK to mitigate the problem of CFW (Love Food Hate Waste NZ, 2020). This campaign is the core action in New Zealand now as part of their ten-year-long plan to divert FW from being ended up in a landfill (Wellington City Council, n.d.; New Zealand Parliament, 2018; Love Food Hate Waste NZ, 2020). In the hospitality sector in New Zealand, Love Food Hate Waste campaigners are encouraging restaurants, and café people to give a discount for their food toward the end of the day, donate food, that otherwise will be wasted, to charities, monitor their food portion sizes, and inviting customers to take leftover away with them (Mirosa, Mainvil, et al., 2018).

2.5 Concluding thoughts and gaps

CFW behaviour is a complex system that involves multi-disciplinary areas of study. From the evidence present in this chapter, the current literature is almost entirely based in developed countries. From Chapter 1 and Chapter 2, we can see that there are very few studies which were carried out in Asian countries. Modern producers and consumers are now interconnected globally in a complex food system. Therefore, the FW issue affects both developed and developing countries. Reducing CFW in one country, such as Thailand, would help to save resources that could potentially be used

in feeding the world. The UK has been one of the leading countries in FW research and campaigns. Currently, there is no clear understanding of this problem in Thailand. The investigation of CFW behaviour among Thai consumers will be able to fulfil this gap. In addition, both countries can learn from each other if we conduct empirical studies to compare CFW behaviour between the two. This Chapter shows that Thailand is obtaining an assistant from abroad for the national flagship project about FW mitigation. It is looking for examples in terms of actions to be taken. UK campaigns have been imitated by other countries because the UK has been a leading country working on this problem before others. However, consumers are culturally different such as collectivist culture in Thailand, and the UK is believed to be more individualist. Gaining more understandings about CFW behaviours of consumers from the two countries would provide information for decision-makers and researchers to adjust policies more suitably. In terms of factors, CFW behaviour in the literature has mainly been investigated as a function of a psychological construct, mainly focussing on consumer attitudes and intention (not) to waste food. There are situations that food can be saved, such as to “minimise” the amount of CFW, and there are situations when food is more likely wasted. Therefore, we focus on decisions when consumers have to trade-off between factors. There is a lack of investigation in this context and therefore focusing on CFW decisions, particularly in developing countries, will add value to the current literature.

Chapter 3
Food Service Providers' Perception of Consumer Food Waste: A Qualitative Analysis

3.1 Introduction

This chapter presents qualitative research that provides preliminary information about consumer food waste (CFW) from the perspective of foodservice providers (FSPs) in Thailand. From the previous chapters, most research studies and public movement about CFW and CFW reduction have recently been carried out among developing countries, particularly in the UK (Graham-Rowe et al., 2014; Mallinson et al., 2016) and particularly by WRAP (Quested, Marsh, et al., 2013; WRAP, 2017c; WRAP, 2018a). Before proceeding to compare British and Thai CFW behaviour, we would like to learn more about FW and CFW behaviour in Thailand. Therefore, this study aims to gain better understandings about the current situation in the country. Exploratory results from this chapter shed light on CFW behaviour in the foodservice sector in Thailand and its drivers, information which has been lacking. This study provides basic knowledge of the topic for further studies in the thesis.

In 2011, the first global estimation of FL and FW quantities from FAO showed that FL problem was more severe than FW in developing countries (i.e., 60% of food produced is lost before reaching the retail stage) (FAO, 2011). In 2019, FAO reported that the magnitude of the FW problems in the former countries is not clear and underestimated due to difficulties in obtaining data from the governments and organisations at national levels (FAO, 2019). However, FW reduction has been a global commitment, as shown in the UN development programme as one of the Sustainable Development Goals (SDGs) for sustainability in our society (UN, 2016). Developing countries like Thailand must also eliminate the amount of FW and not just focus on FL on farms. Nonetheless, very limited data about FW and CFW are available in Thailand (Nikomborirak et al., 2019).

Thailand had 27.8 million tonnes of municipal solid waste in 2018, which has increased 1.64% from the previous year because of the increase of population, consumption, urbanisation, and tourism promotion (Pollution Control Department, 2019). Around 60-64% of this waste is organic waste (e.g., FW) (Nikomborirak et al., 2019; Thanawat, 2019). This figure only includes the waste that the government is responsible for (i.e. collected and managed by governmental units). Therefore, the actual amount of waste

is higher than this. It has not included the garbage taken care of by private suppliers or by each household internally (see section 0). On the day that the Save Food Campaign was launched in Thailand, Rosa Rolle[11], a key person from FAO in the Asia-Pacific region, stated that:

> *"While this [food loss and waste] is a global issue, and while there are no exact figures on how much food is wasted at the consumer level or in the foodservice and food retail sectors in Thailand, it is easy to see in many restaurants that food prepared for consumers often isn't finished by them."* (Dow, 2015).

This signifies the importance of CFW reduction in Thailand, even though there has been a lack of data. In Pakistan, Aamir et al. (2018) also pointed out that there was no equipment or tools for restaurant staff to measure FW quantity easily.

Soma and Lee (2016) also emphasised that the restaurant is another essential place to investigate further in Southeast Asian countries. These statements signify that there is a need for more research studies in Thailand, particularly in a restaurant setting, in order to find solutions to tackle the FW problem. Results from the previous literature review chapter also show that some researchers found a place of dining is one driver of CFW behaviour. However, there is still a lack of information not only in Thailand but also among developing countries (Parfitt et al., 2010; Soma and Lee, 2016; FAO, 2019). Previous research studies and decision-makers' projects addressing the problem are based in western countries (Katajajuuri et al., 2014; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015; Lorenz, Hartmann and Langen, 2017; Lorenz, Hartmann, Hirsch, et al., 2017; Sakaguchi et al., 2018).

FW at foodservice premises includes waste from mismanagement within restaurants, kitchen waste and CFW (BSR, 2013; Heikkilä et al., 2016; De Clercq et al., 2017; Principato et al., 2018). Principato et al. (2018) emphasised that there is a need to distinguish between the kitchen waste and CFW in the hospitality sector so that researchers and restaurant managers can better identify drivers and solutions to the problem. Results in Aamir et al. (2018) and Filimonau et al. (2019) showed that restaurant staff saw their clients as the key drivers who contributed the most to the

[11] Rosa Rolle has been a key contributor to FAO works regarding FL and FW particularly in the Asia-Pacific region. For example, she also provided technical data in the latest report about FL and FW in a FAO 2019 document (FAO, 2019).

total amount of FW occurring in this sector. In terms of CFW behaviour, some studies have attempted to investigate CFW behaviour of students and company employees in canteens (e.g. in schools, universities or companies) (Lorenz, Hartmann and Langen, 2017; Boschini et al., 2018). However, more studies about CFW behaviour in other types of catering services are required in order to comprehend the real-world situation. FSPs or owners and managers in food service sectors (i.e., restaurants, cafés, or food stalls) are people who have the opportunity to observe consumer behaviour during a meal as well as ask people for their feedback regarding food and services. Therefore, FSPs in Thailand were interviewed to provide insights into CFW behaviour at a food service location.

Saving leftover food would help consumers and caterers to avoid wasting food in an out-of-home meal. A “doggy bag” or a “doggie bag” is a term generally used in the English-speaking world that means a pack of leftover food when eating out for diners to take home (Cambridge Dictionary, n.d.). There are research studies investigating motivation and hindrance to asking for a doggy bag because people, particularly in some developed countries, do not feel comfortable to ask for it (Sirieix et al., 2017; Mirosa, Liu, et al., 2018). Since the term has its history and cultural traits reflecting an excuse to save the leftover food for their pets to avoid being judged of being poor or being wasteful (Gambardello, 2013), we will avoid this word in this study because it would suggest a different meaning from what Thai participants meant. In Thai, the equivalent word for a doggy bag would simply be “leftovers”, “a pack of leftover food” or “a wrap to take home”.

Therefore, this study aims to gain preliminary insights into CFW behaviour in Thailand from an FSP’s point of view in broad aspects. The objectives of this study are 1) to explore CFW behaviour in catering service in Thailand and 2) to obtain basic knowledge about CFW for further studies.

3.2 Method

This empirical study is based on a qualitative method (Harris et al., 2009; Berg and Lune, 2016). This approach was chosen due to the paucity of the literature about CFW in developing countries. Qualitative methods have been used as a starting point for gaining information about CFW issues (Fonseca, 2013; Abeliotis et al., 2014; Farr-Wharton et al., 2014; Graham-Rowe et al., 2014; Porpino et al., 2015; Heikkilä et al., 2016). Since little is known about CFW in Thailand in catering services, this exploratory

study was used to gain basic data on which the following quantitative study was constructed (Rowley, 2012; Berg and Lune, 2016).

The in-depth interviews with FSPs were chosen to obtain rich data of a complex issue about the CFW based on a small number of participants (Johnson, 2001; Asioli et al., 2016). Another main advantage includes privacy for interviewees, who could freely explain their experience (Rowley, 2012). Moreover, face-to-face interviews enable FSPs to clarify their points to the researcher confidently, unlike a group interview in which they could be under peer pressure (Bolderston, 2012; Rowley, 2012). Therefore, this method is suitable for this study because FSPs would be able to share their experiences and opinions about their customers' CFW behaviour openly.

The semi-structured qualitative interview technique was applied which included predetermined open-ended questions, and the interviewer was able to ask other questions depending on topics emerging in the interview (DiCicco-Bloom and Crabtree, 2006; Berg and Lune, 2016). This allowed researchers to be able to adjust probing questions according to each participant's circumstances and experiences (Asioli et al., 2016).

3.2.1 Participant recruitment

FSPs who have a managerial role (either an owner or a manager of a catering service) were recruited using a snowball sampling technique, sometimes called a respondent-driven sampling or chain referral (Baltar and Brunet, 2012; Berg and Lune, 2016; Allen, 2017; Gile et al., 2018). Due to the nature of the catering business, FSPs could be busy and hard-to-reach (Aamir et al., 2018). Moreover, interviewers would need to earn trust from those participants (Harvey, 2011). Therefore, snowball recruitment can help researchers to overcome these challenges (Allen, 2017). It started from FSPs whom the researcher knew, and then they introduced other FSPs to take part and helped them to connect with the researcher (Allen, 2017). Facebook[12] was used as the main communication method to gain participants' confidence in joining the interview because of transparency – providing prospective FSPs with information about the research and the researcher (Harvey, 2011; Baltar and Brunet, 2012; Edirisingha et al., 2017). In addition, this social media showed that the interviewer is an "ordinary

[12] Not many people in Thailand use e-mail, particularly those who run an SME business in food service. However, Facebook is popular and linked between FSPs in the snowball technique easily.

person" (i.e., not a business competitor with benefit purposes) to whom participants would provide data with trust.

In total, 20 FSPs participated in this in-depth interview. The characteristics of those interviewees are shown in Table 1.

Table 1 Participant profiles based on their roles, service types, size of food services, and location in Bangkok

Participants	Role	Type of business	Size	Location[13]
P1	Owner	Noodle and ready-to-serve style food with rice	< 20 tables	Inner city
P2	Manager	Desserts, waffles, pancakes, brunch, and coffee	< 20 tables	Inner city
P3	Manager	Desserts, café foods, and coffee	< 20 tables	Inner city
P4	Owner	American food	< 20 tables	Urban fringe
P5	Manager	Western food	< 20 tables	Urban fringe
P6	Manager	Thai north-eastern food	< 20 tables	Urban fringe
P7	Manager	Thai-western fusion style café food	< 20 tables	Inner city
P8	Manager	Noodle and seafood	< 20 tables	Urban fringe
P9	Manager	Noodle and stir-fried food	< 20 tables	Urban fringe
P10	Owner	Noodle	< 20 tables	Urban fringe
P11	Owner	Thai food	< 20 tables	Suburb
P12	Owner	Steak	< 20 tables	Suburb
P13	Owner	Coffee and ready-to-serve style food with rice	< 20 tables	Suburb
P14	Owner	All-you-can-eat BBQ and Thai food	< 20 tables	Suburb
P15	Owner	Japanese food	< 20 tables	Suburb
P16	Manager	Thai food	20-50 tables	Inner city
P17	Manager	Thai food	20-50 tables	Suburb
P18	Manager	Thai food	20-50 tables	Inner city
P19	Owner	Thai food	> 50 tables	Suburb
P20	Owner	Thai and Chinese food	> 50 tables	Suburb

[13] Bangkok zones (inner city, urban fringe, and suburb) are based on Bangkok Master Plan (Bangkok Metropolitan Administration, 2013)

Half of the participants are owners of the food services, whereas another half has a managerial role. Most of them, 14 out of 20, serve local food or Thai food while the other six places provide foreign foods such as American, Japanese, and western-style desserts, snack foods or cafés. The size of the food services ranges from having less than 20 tables (15 places), 20-50 tables (3 places) to more than 50 tables (2 places). Those services that have less than 20 tables are considered to be a small business, which is similarly described in Robson (2013). The participant's number in the left column is used to refer to interviewees in the Results section.

3.2.2 Interview procedure

Interviewees were contacted to be informed about the interview schedule and clarify the purposes of the interview. The face-to-face interviews took place in Bangkok, Thailand during November 2017 at the participant's workplace (e.g. in a restaurant), and each session lasted approximately 25-35 minutes. The interview questions were approved by The Ethical Committee at the School of Agriculture, Policy and Development, University of Reading. Overall, the interview consisted of two main groups of questions (see Appendix 3). First, to warm up the conversation, a general topic about FW was a starting point. Second, the conversation focused on CFW in a meal setting and FSPs' opinions about leftover food. The questions had been outlined before the interview and were adapted according to the interview direction, and more questions were asked based on each interviewee's answers (Arnould and Wallendorf, 1994). Before the interview began, the owners had been advised about the research information, objectives, and introduced the interview. The researcher was permitted to record the interview before the question's session.

3.2.3 Data analysis

The researcher analysed data, and the analysis occurred during and after the interview (DiCicco-Bloom and Crabtree, 2006; Malhotra et al., 2017). During the interview, the researcher followed the instruction by Malhotra et al. (2017). The data analysis should be carried since during the interview, particularly when the interview is semi-structured. Body language, gestures, voice tones were observed, and the direction of the questions would, therefore, redirect partially based on this data interpretation during the interview. After that, summaries were written by the interviewer and collated alongside the notes from the interview. Thematic analysis (TA) was carried out to

identify themes which emerged from the interview. The procedure of TA follows the five steps, as stated in Yin (2015) and Castleberry and Nolen (2018). First, audio records, notes from the interview and an interview summary were transcribed and transformed into electronic files. Recordings of the interviews were transcribed into a written form in the Thai language. The transcription was read through one more time together with the audio file for improving the accuracy (DiCicco-Bloom and Crabtree, 2006). Second, data were reduced by coding using NVivo 11 software (QSR International) and by a singular coder. The coding process was conducted in the Thai language to maintain its meaning. Coding is a process of finding trends, similarities, and differences in the interviews (Braun and Clarke, 2006; Yin, 2015). Third, codes were restructured and put into themes using hierarchies or diagrams to see patterns in the data. Fourth, the themes were interpreted and extracted for their relationship with each other. In this step, themes in TA should be able to show analytical meanings captured in response to the research questions (Castleberry and Nolen, 2018). Last, after the raw data had been coded and put into themes to show patterns of answers, the conclusion was made. Castleberry and Nolen (2018) pointed out that this analysis process should not be in a linear form. This is because some new codes and themes could be identified while establishing other related patterns. Therefore, steps two and three could be repeated, and new themes could be assembled. The interpretation from Thai to English was carried afterwards for the result presentation purpose.

3.3 Results

FSPs' observation about CFW behaviour in a dining situation and their view about this behaviour will be presented in this section. Themes and sub-themes are shown in Table 2. Overall, FSPs were aware that not every customer can finish their meal, although their expectation shows they wanted to see no food left on their customer's plates. Moreover, if consumers could not finish their food, saving food (i.e., asking for food to be taken away) was a key behaviour to indicate if eventually there would be CFW at their premises. FSPs perceived asking for a container to pack the food as appropriate action and would encourage diners to take the leftovers home, although some owners thought it would increase their costs. FSPs might be worried about their food quality if the food left is a considerable amount and customers did not want to take it with them.

Table 2 Overall themes and sub-themes of the interview results

Topic	Themes	Sub-themes
CFW Behaviour in "Thai Society" from the perception of FSPs	1. People cannot finish their food	- Save leftovers - Do not save leftovers
	2. People can finish their food	
	3. People occasionally waste food	
	4. CFW behaviour before consumption to avoid creating FW	- Customise portion - Customise ingredients
	5. CFW Factors	- Demographic - Food satisfaction - Over ordering - Personal factors - Physical environment
FSPs' views about packing leftover food	1. Feeling	
	2. Judgement	
	3. Expectation	
	4. FSPs' views about packing leftover food	- Positive - Negative
Strategies to reduce FW	1. Learning and experience	

3.3.1 Consumer food waste behaviour in "Thai Society" from the perception of food service providers

There are five main themes and two sub-themes of Thai people's CFW behaviour: 1) people cannot finish all food, 2) people finish all food, 3) it is an equal chance that people can or cannot finish all food, 4) CFW behaviour before consumption to avoid creating FW and 5) factors affecting CFW behaviour. There are two sub-themes for the perception about people who have leftover food after a meal: 1) save the food and 2) leave the food unclaimed. There are two possible ways that consumers could behave when ordering food to prevent CFW, which are 1) asking for a reduction of serving size and 2) asking for changes in ingredients.

3.3.1.1 People cannot finish food

A common view among this theme was that there was a strong likelihood of having food left over and saving or not saving the leftovers is the decision that could happen afterwards. For example, some interviewees shared their experience with some negative feelings about CFW behaviour: *"Oh, Thai people waste food a lot!"* while another accepted that this behaviour is *"expected"*, as one put it: *"It's normal. They will have some food left."*.

Behavioural choices after having leftover food

There are two choices of behaviour once there is food left on a dining table. Clients decided whether they would reclaim the food either by themselves or after being encouraged by FSPs. However, not every customer would ask to take the leftover food away with them. Although many FSPs (e.g. P12, P2, P19, and P20) tended to offer this service explicitly, none of the FSPs would probe for reasons why the customers did not want to take the leftovers. For example, one manager of a small brunch restaurant downtown said:

> *"I would normally ask them 'would you like us to pack the leftover food for you to take it back?'. And it's up to them to take it or not, I don't care so much about it, but I might feel like they should."* (P2)

The owner of a large-sized restaurant speculated about diners' main reasons for saving the food as shown below:

> *"Nowadays, people always save the leftover food and take it home with them because of the recession in Thailand. People save money and are more careful about what they spend."* (P20)

Two managers (P5 and P17) noticed that the amount of leftover food affected customers' decisions.

> *"If there're only one or two bites left, they won't have it packed" (P5)*

> *"If it's a lot left, they will save the food. If not a lot, they won't save it. They won't be embarrassed to ask for a bag" (P17).*

However, there are occasions when FSPs seemed to be aware that consumers were not going to save leftover food. A manager (P3) who supervised a shop that sold desserts, café style food, and coffee was certain that it was a rare occasion the leftover food will be taken away with her diners. She said:

> *"Most of them would just leave it there. Our food and dessert are cold served and it's not that they will look good or be suitable to eat again."* (P3)

Additionally, P6 gave an example of when one group of her customers refused to take some leftover papaya salad away because *"they said it was too spicy for them. So, they don't want it. I don't know, maybe they're going somewhere else after that"*.

3.3.1.2 People finish all food

The second theme of FSPs' observations is that most people could finish all the food. Less than half of the participants generalised that Thai people will not waste food from meals. For example, some interviewees said: *"In general, people eat all of the food they have in front of them."*. Another interviewee (P7) commented: *"95% people completely finish their meal."*. The manager (P8) of a noodle shop and the owner (P14) of a BBQ buffet commented about the nature of their food and their restaurant policy respectively:

> *"It is very rare for me to see food waste on customers' tables in my restaurant. They might have a little amount of soup left but it's normal. It's not that they waste it".* (P8)

> *"I've seen customers who come as a group help each other to finish all the food they took from the buffet table. It is because I will charge them if they have too much left. And as we are a buffet place, they cannot take leftover food home anyway. They have to be responsible for the food they have already taken."* (P14)

3.3.1.3 People occasionally waste and finish food

A few informants remarked that people would behave in both ways (i.e., occasionally waste food). This idea was also developed later by FSPs whose first firm thoughts were in the first two themes (consumers either waste or finish food).

Only a couple of participants showed that they were reluctant to draw only one conclusion about CFW behaviour at their places. They commented that consumers would behave differently depending on the context, for example, different places of dining, number of guests, and personal preference, as one manager (P18) who managed a restaurant in Bangkok downtown said:

> *"It was half and half who can or cannot finish food. Those who eat a lot and finish all their food might waste a lot at home. I also understand those people who might have something left on their plate that they personally don't like eating in general. For a few people, the food might not meet their satisfaction level and therefore they don't eat it."* (P18)

Another interviewee (P10) alluded to both possibilities: *"Some people finish all food and for some who do not, only a few ask for takeaway. They mostly leave it like that."* These FSPs clearly welcome the idea that people are different, and CFW is possible. This perception was gradually shown among the rest of the participants across the whole conversation because there are many factors involved.

3.3.1.4 Customised food orders to avoid FW

Almost every interviewee had an experience of when clients ordered food with special requirements. It resulted in a lower likelihood of having CFW after a meal. Examples of statements for this theme are:

> *"I'm okay if customers tell me what they don't like [to eat]. It's quite often that there will be some diners who tell me what not to put in their food, they don't want this and that."* (P18)

> *"They tell me what they don't want me to add in the food like some vegetables. That's great. This means I don't waste it and I can use that ingredients to serve other customers."* (P7)

> *"Some customers are not that hungry. They will inform us not to serve them too much."* (P17)

However, a couple of FSPs commented about this behaviour from different perspectives. One noted that this behaviour would create more work and another person noticed this behaviour is influenced by food price as shown below.

"It's fine they tell us what they like, and we can adjust but I would not do this myself when I eat out. I know that chefs or people in the kitchen have prepared the food in a system in advance. If I added or removed some ingredients or changed the portion, I would just create more work for them." (P2)

"Our menu is not cheap. So, none of my customers asked me not to serve too much or to reduce the portion because of the price [suggesting a large portion]." (P18)

3.3.1.5 Consumer food waste factors

When restaurant owners and managers saw that there were leftovers, most of them said they often asked if there was anything wrong with the food or the service. This allows them to obtain the information to improve their services and it was when FSPs observed factors affecting CFW behaviour as shown in

Figure 8. Overall, from FSPs' point of view, there are five themes of CFW behaviour drivers which are the demographic, food satisfaction, over-ordering, personal factors, and food safety concerns.

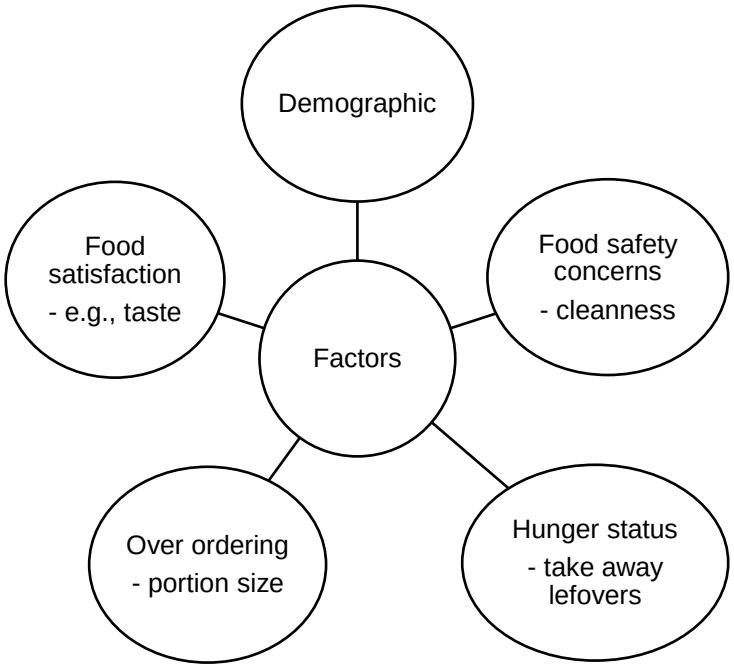


Figure 8 Thematic diagram for CFW factors in a dining situation

Demographic

There are opinions about gender, type of employment, and age as shown in the statement below. FSPs have shown that they noticed some consumers such as women and old people would be more likely to waste food, and people whose work involves physical activity would be more likely to finish all the food.

> *"Mainly women will have leftover food because they want to lose weight. Those people like from construction sites who need energy would eat everything, all gone, nothing left!"* (P1)

> *"Some clients are old and sometimes they might be allergic to something. They won't eat specific ingredients. So, they can't finish it." (P16)*

Food satisfaction

Customers had meal food preferences to satisfy themselves for example specific tastes or overall liking. However, sometimes it was not always clear to FSPs which attributes of food (e.g. taste, appearance, or portion size) their customers would mean in terms of liking and not liking and FSPs only perceive or guess that the food was left because their customers "did not like".

> *"There are times my customers cannot finish all the food because it was too spicy for them. They can just tell me they don't want too much chilli in it. They did not tell me that. So, there is food left."* (P6)

> *"Food is not what they like. So, they cannot finish it."* (P18)

Over ordering

There is a theme of abundance of food ordered to a table particularly when there are special occasions or when diners come as a group.

> *"Some people would just order a lot more than they need to share in the middle or sometimes they have special occasions like a family gathering. If they come alone, this doesn't happen that often."* (P9)

> *"They should order just enough for them to be able to finish. They order too much because they don't know their ability." (P12)*

> *"There are a few cases of big tables when they order too much to be wasted….Maybe, they were not aware that our portion is large"* (P20)

Hunger status

This theme refers to hunger level and habits of restaurant-goers. Some FSPs always receive an answer *"I'm full"* when they ask if their customers would like to take the leftover away with them. Another interviewee described personalities of individuals as being "picky" with food and therefore could not finish it.

> *"Apart from the food not being as tasty as they want, they have food left on their plate because they are full."* (P2)

> *"They have leftover food because they are full."* (P18)

> *"Those who are difficult to please and are picky about food will always have leftover food."* (P15)[14]

Food safety concerns

There was one unique comment from a participant about the restaurant's physical environment as a key CFW behaviour driver. Lack of cleanliness of the dining place can cause diners to lose interest in food.

> *"[Customers] can be quite annoying like they say 'food is not clean enough, staff are not clean, and the restaurant has insects. I won't eat this.' I've seen many Bangkok people behave like this. This is really bad"* (P15)

Moreover, there are many themes emerged from one FSP (P20) who has run her large restaurant for more than 20 years who said that: *"The main reason for people to waste food in a restaurant, first, it is because they are full. Second, the taste does not meet their expectation. Third, they ordered it wrong and did not tell us. Or fourth, they were*

[14] This statement that shows pickiness trait also falls in the theme of "food satisfaction" factor.

too hungry and ordered too much.". Her statement shows the factors about food satisfaction, over ordering, and personal factors.

3.3.2 Food service providers' views about consumer food waste behaviour

The previous sections have presented CFW behaviour and drivers from the observation of FSPs. There are more feelings and opinions about CFW behaviour that restaurant owners and managers have explained as shown in Figure 9. The themes are "feeling", "judgement", and "expectation". First, FSPs revealed negative feelings about CFW behaviour. Almost 80% of the informants felt "sia dai"[15]. The term "sia dai" in Thai means to regret or feel sorry when losing something (NECTEC, n.d.; Bradshaw, 2014). However, in the context of FW, it can be described in English in sentences rather than a word, such as "what a pity!" or "that's a waste!". Second, FSPs commented with judgemental vocabulary that wasting food means a person is being "extravagant", "wasteful", "picky", "careless" or "does not appreciate the value of food" and "strange".

Figure 9 Keywords of FSPs' Views of about FW and FW Behaviour

In the opposite scenario, one manager (P6) expressed her positive feeling for seeing no FW, as she put it: *"I will be glad to see they eat all the food; that means they like our food."*. Third, FSPs also presented their views with expectations of their clients to not waste food. For example, the owners of restaurants at the outskirts of Bangkok commented that:

[15] "sia dai" feeling in the context FW is equivalent to when a speaker said, "what a pity to see that food go to waste.". The whole sentence describes the term "sia dai" better than one word, "pity". Further explanations about this word can be found among the expat community in Thailand such as forum.thaivisa.com/110181-เสียดาย.

> *"I'm from rural areas far away from Bangkok. I was taught to eat all the food. I think everyone should finish all their food. Bangkok people are so bad at this. Many of them are wasteful."* (P15)

> *"People in Thai society should finish all the food on their plates. Everyone should feel regret or guilty if food is wasted."* (P20)

Working in Bangkok downtown, the following manager (P2) conveyed messages from his grandparents that influences his opinion toward FW.

> *"I was taught by my grandma to finish all the food on my plate because farmers work hard to produce every single grain for us… I strongly think everyone should follow this, but I also understand that sometimes people are very full. So, they have leftovers. Or I would guess there is something wrong with the food. If it were the food in my shop, I would ask why they cannot finish."* (P2)

There is also an expectation from FSPs about consumer behaviour when ordering food as shown below:

> *"You should start thinking about this from the beginning even before you order or prepare food that you will be able to finish all the food. Then eat it all, otherwise it will be rubbish and useless. If you cannot finish food, why do you order it or prepare it from the beginning."* (P20)

However, there are a few managers who did not have any expectations and refer this to a personal issue. For example, P6 mentioned: *"It depends. Everyone should finish all their food but it's up to them. And I'm not interested in whether others will be able to finish food or not."*. Another participant from an international food restaurant in Bangkok downtown also argued that *"It's none of my business. I don't mind if they can finish or not finish food."*. (P7)

3.3.2.1 Food service providers' views about packing leftover food

There were two groups of FSPs' opinions about diners' behaviour when claiming the leftover food: positive and negative feelings. Most FSPs would encourage food-saving behaviour but they might hesitate if the size of leftovers is small or the extra packaging would increase their cost.

Positive

The majority of interviewees shared the same attitude that taking the leftovers home was acceptable. In fact, FSPs would encourage customers to pack the food when they see there are leftovers on the table even though the customers did not initiate this service.

> *"I don't mind if they ask me to pack their leftover food for them. It means these people know the value of their money and know to spend wisely."* (P15)

> *"My customers normally ask for the leftovers to be taken back with them. I think they value the food. They care about not wasting the resources because it can be kept in a fridge to be heated up and eaten later. It won't be spoilt."* (P20)

Negative

Only a couple of FSPs revealed their negative views about packing the leftover food. This is because of the higher cost (P5) and perceived irrational behaviour due to the lower amount of food left (P6).

> *"I sometimes don't want people to do that, [ask for a container to pack the leftovers], because it means extra costs [of packaging]."* (P5)

> *"If the amount of leftover food is so little, I would be like 'really, do you still want me to pack that?'."* (P6)

On the other hand, the negative feelings could occur because FSPs guessed there was a hidden message behind having leftover food (P18) or because their customers did not ask to save the leftover food at all (P7).

> *"I normally ask how the food is when they have some food left on their plate. When they ask me or my staff to pack the food for them to take away, sometimes they give the food to other people. Most of the time I would be worried if the food is not tasty. Maybe they don't like it, but they do not want to directly let us know."* (P18)

> *"If they have a lot of food left and don't ask us to wrap the food for them to take home, I will start to lose my confidence. I would think there is something wrong with the food or we did something wrong."* (P7)

3.3.3 Strategies put in place to reduce FW by FSPs: "learning and experience"

When talking about FW in their restaurants, FSPs revealed that they would also try to reduce the amount of food that could be wasted on the customers' table. In addition to asking customers if they want to take leftovers home, they have learnt and gained experienced to avoid FW by reducing or adjusting the amount of food they serve or checking customers' needs before serving. One participant explained her experience and said, "*if I see they have already ordered a lot, I would serve smaller portions if they order the second round because they might not be able to finish all the food."* (P11). The other FSP revealed that she learnt over the past year that some women will not be able to consume a lot of rice and she mentioned that "Some women eat a lot less than men. So, in my experience, I don't have to serve her a lot of rice unlike when I serve a group of men." (P1).

Some FSPs would check for customers' needs before cooking as a strategy to avoid having consumer plate waste. For example, one noodle bar staff would ask if some of their customers, particularly kids, want vegetables in their noodle. Some customers do not give this instruction and there would be some vegetables left uneaten.

> *"Some kids don't eat vegetables. I sometimes ask them if they want me to put vegetables in the noodle. It's such a waste if I put in and they don't eat it."* (P8)

3.4 Discussion

The perception about CFW of FSPs who were observing their customers has been captured in this chapter. This research project was conducted in Thailand due to a lack of clarity and data about FW situation in the country. There was a limitation in this project. The coding procedure was conducted based on a sole researcher and triangulation was not carried out.

From FSPs' point of view, there are different CFW behaviour patterns in catering services in Thailand reported in this study. In a food service context, consumer

behaviour that would help minimise CFW is customising food when ordering and saving leftover food. Overall, there are occasions when food is not finished and this is influenced predominantly by demographic types, food satisfaction, over-ordering, personal factors, and physical environment. Since CFW behaviour is varied by the context and situation, future studies should use a research technique that can control some factors to minimise variations in a dining situation.

First, results in this study also show that consumer behaviour before and after consumption can either help prevent or create more CFW. At the pre-meal stage, some restaurant clients have specific details to add to their food order. At the post-meal stage, they can decide whether to take leftover food home with them. Regarding the food order, there are groups of restaurant clients who want to change their portion size or ingredients because they are not hungry, or because they do not like a specific food. The ability to customise menus was supported by Shimmura and Takenaka (2010) as another method to reduce the likelihood of having CFW at a restaurant. Diners should be able to adjust the food by considering their circumstances such as hunger level and other personal matters (Shimmura and Takenaka, 2010). However, in our study, FSPs might have some negative comments about this behaviour because it adds extra tasks to their cooking steps. Cohen and Story (2014) argued that caterers should maximise their ability to let consumers choose what they are willing to consume according to their personal limitations, such as health (Cohen and Story, 2014).

Second, saving leftover food after a meal also reduce the likelihood of food being wasted. In previous studies, the issue of customers asking for a take-away box and FSPs offering this service has a cultural dimension and is varied in different societies (Bozzola et al., 2017; Sirieix et al., 2017; Hamerman et al., 2018; Mirosa, Liu, et al., 2018; Principato et al., 2018). While taking away the leftovers can be perceived as inappropriate, embarrassing or is a stigma among consumers in some societies (Mirosa, Liu, et al., 2018; Hamerman et al., 2018; Shimmura and Takenaka, 2010), Thai FSPs in this study did not convey that message from their point of view. In fact, Thai restaurant staff offer their customers a take-away container to pack leftover food and appear to provide this service routinely, consistent with some staff in Bulgaria (Filimonau et al., 2019) and New Zealand (Mirosa, Liu, et al., 2018). In Hamerman et al. (2018), this restaurant practice is perceived as good customer service. The majority of FSPs in our study show positive feedback about customers asking for leftover wraps except some situations when the amount of leftovers are little for a few cases. However, some FSPs fear that customers' dissatisfaction is signalled by the amount

of leftovers or when customers do not ask for a leftover pack. These findings are also consistent with Shimmura and Takenaka (2010) and Sirieix et al. (2017). From our study, FSPs would firstly blame themselves; for example, perhaps their food is not delicious or does not meet customers' level of satisfaction. While this may be true, there might be other reasons from the consumer's perspective, such as the culture of "face-saving" among Chinese consumers as shown in Liao et al. (2018), diners do not save the leftover to show their wealth (i.e., "not to lose face"). Moreover, according to Ellison and Lusk (2018), there are some factors which affect the consumer's decision to save the food, such as the size of leftovers and meal cost.

Third, FSPs indicated five types of CFW drivers which are the demographic, food satisfaction, over ordering, personal factors, and physical environment. In general, CFW due to over ordering and feeling full could be prevented, and FSPs can take responsibility (Cohen and Story, 2014) such as reducing portion sizes (Steenhuis and Vermeer, 2009). Filimonau et al. (2019) argue that caterers can offer smaller-sized portions with lower prices and at the same time allow customers to pay if they wish to add more orders. In terms of food satisfaction, Heikkilä et al. (2016) also found this the main driver for CFW in the food service sector. It is very subjective and varies by individual. In our study, participants indicated that they asked for consumer feedback in order to improve their service. This might also help CFW reduction in the future.

Fourth, although wasting food is perceived as normal, there are normative expectations from FSPs that consumers should finish their meal. Attitude about what one should or should not do complies with the definition of norms simply identified by Elster (1989). According to Schwartz (1977), this also has the characteristic of influences from personal norms or the feeling of moral obligation. The internal punishment would be a feeling of guilt and shame if they waste food. On the other hand, while FSPs expect their customers to not waste food, they also put some strategies to reduce customer plate waste. The FSPs adjust their behaviour according to their learning effects and experience such as reducing the amount of food served to some customers (e.g. female customers) or checking if their customers want them to put some ingredients (e.g. vegetables) in the food. FSPs learnt this from observation and this learning effect would help them reduce FW in their restaurants (Solomon, 2015).

Last, the second objective of this study is to fine-tune ideas in order to construct further studies. We found that observing CFW behaviour in a real-world situation is possible,

but it can be challenging due to contextual and situational factors. From FSPs' experience, CFW behaviour tended to be varied by many sensorial and physical factors which are difficult to control, such as taste, appearance of food, the type of food diners order on different occasions, or the number of people who have a meal together. To overcome this, there are some possible research methods, such as observing one specific dining place (Wansink and van Ittersum, 2013; Wansink, 2004), recruiting diners into one controlled venue (Mollen et al., 2013) or using hypothetical situations (Atzmüller and Steiner, 2010; Ellison and Lusk, 2018). In addition, to be able to uncover CFW behaviour further from a consumer's point of view, asking consumers to project their opinions using a projective technique might reveal slightly different answers with less bias of trying to impress the researchers (Vidal et al., 2013; Jones et al., 2015).

In this study, we interviewed only FSPs as experts or observers of consumer behaviour in a dining situation. Future study should explore further the viewpoints of the consumers. Only FSPs who managed restaurants, cafés, and small food service businesses were recruited in our study to minimise the contextual variance due to different business types. There are other areas of catering services that future research can touch upon, such as hotel chains and food catering at an event (e.g. parties and specific venues for a wedding) which could show different CFW behaviour.

3.5 Conclusions

There are different CFW behaviour patterns in catering services in Thailand from the FSPs' point of view. The results show generalisation of FSPs' opinions about Thai consumers and their CFW behaviour. Overall, there are occasions when food is not finished and this is influenced predominantly by demographic types, food satisfaction, over ordering, personal factors, and physical environment. Consumer behaviour before and after consumption can minimise the amount of CFW. This includes customisation of portion sizes and ingredients to meet consumers' needs. Further research can use hypothetical situations in order to investigate consumers' decisions in the context of CFW to be able to control or limit the effect of some factors, such as consumers' hunger levels. The findings about asking for taking leftovers home or not as a method to reduce FW at a restaurant and the point about hypothetical situations were brought forward to the consecutive project in the next chapter.

Chapter 4
Consumer Food Waste Behaviour: A Quantitative Analysis

4.1 Introduction

FW is increasingly recognized as an environmental, economic and food security issue and is receiving corresponding levels of attention, particularly among policymakers worldwide (Koester, 2014; Nikolaus et al., 2018). Moreover, CFW behaviour has become a popular topic at national and international levels in the past decade (Stuart, 2009; Parfitt et al., 2010; FAO, 2011; 2019; Dow, 2015; Rohm et al., 2017; Roodhuyzen et al., 2017). It is also becoming apparent that CFW patterns of how consumers behave in one country could be useful for policymakers to set up tools to minimise FW in society (Rohm et al., 2017; Benyam et al., 2018). Campaigners and government agencies in developing countries such as Thailand tend to look at the successes and failures of movements in leading countries such as the UK and the US with the hope of implementing similar campaigns in their own countries (e.g., see FAO (2014b) and Nikomborirak et al. (2019)). Additionally, researchers in Thailand are being assisted by multinational researchers who might not be familiar with Thai consumer behaviour and culture (GIZ, 2018; Nikomborirak et al., 2019). Due to the huge range of variables (including lifestyle and attitude) which influence FW behaviour in different countries (Stefan et al., 2013; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015), measures used in tackling the increase of FW in one country may need to be adapted before being implemented in other countries.

There is evidence showing that consumers waste food more in Europe than in Southeast Asia and that this is mostly due to people having higher incomes (FAO, 2011). Nonetheless, food consumption patterns in the East are increasingly influenced by the western style, and people are becoming richer (Pinstrup-Andersen and Watson II, 2011; Young, 2012). It is likely, therefore, that the amount of FW in developing countries will also increase. Most economic studies so far, however, have investigated attitudes towards, and motivations for wasting food (Stefan et al., 2013; Neff et al., 2015; Parizeau et al., 2015; Aschemann-Witzel et al., 2017) with a focus on western countries and CFW investigations in less developed countries are still at the initial stages (see Soma and Lee (2016), Aschemann-Witzel et al. (2019) and Nikomborirak et al. (2019)). In Thailand, decision-makers and research institutes have only just

recently started to raise awareness about CFW (Nikomborirak et al., 2019). Therefore, there is a lack of studies focussing on how consumers make FW decisions (Lusk and McCluskey, 2018; Ellison and Lusk, 2018) particularly in the context of developing countries, in which the area of food loss has been more focused at the production side (i.e., FL) (FAO, 2011; Hodges et al., 2011). Therefore, it is hoped that a CFW comparison between countries will fill this gap to a certain extent.

In terms of consumer behaviour, the decision to save or waste food could be framed as an economic decision depending on consumers' incentives, preferences, attitudes, habits and resource constraints (Ellison and Lusk, 2018). To the best of our knowledge, there is a lack of literature that compares CFW behaviour between developed and developing countries. This project hopes to plug the gap.

From the previous chapter, consumers likely save food if there is left after a meal in a restaurant. However, not all the time that the leftover is saved, and reasons are not clear. There seem to be factors influencing consumers during this decision process. The quantitative research aims to understand CFW behaviour by comparing this behaviour in developing and developed countries. There are two main objectives for this study which are: 1) to investigate factors affecting CFW behaviour focusing on saving leftover food, and 2) to compare the CFW behaviour between the UK and Thai consumers. In other words, this study is looking for answers for the research questions 1.1, 2.2, and 2.3 presented in Chapter 1.

4.2 Methodology

From the findings of Chapter 3, it was found that collecting data from a real-world situation of meal consumption is challenging. Using a hypothetical technique would be more applicable. Therefore, the study has gained insight into CFW behaviour in a cross-country manner using a vignette approach. The survey method was implemented by using an online questionnaire as a tool to collect data. The questionnaire was built upon the knowledge gained from the literature review and from the semi-structured in-depth interview presented in the previous chapters. Figure 10 shows the conceptual framework that reflects these accumulative background aspects influencing CFW behaviour.

This survey depended on self-reported information because collecting CFW behaviour in the real-world situation would be time-consuming and require a lot of effort and commitment (Koivupuro et al., 2012; Aschemann-Witzel, de Hooge, et al., 2018).

However, one part of the questionnaire, the vignette experiment (VE), is based on hypothetical scenarios to allow respondents to reflect on CFW behaviour.

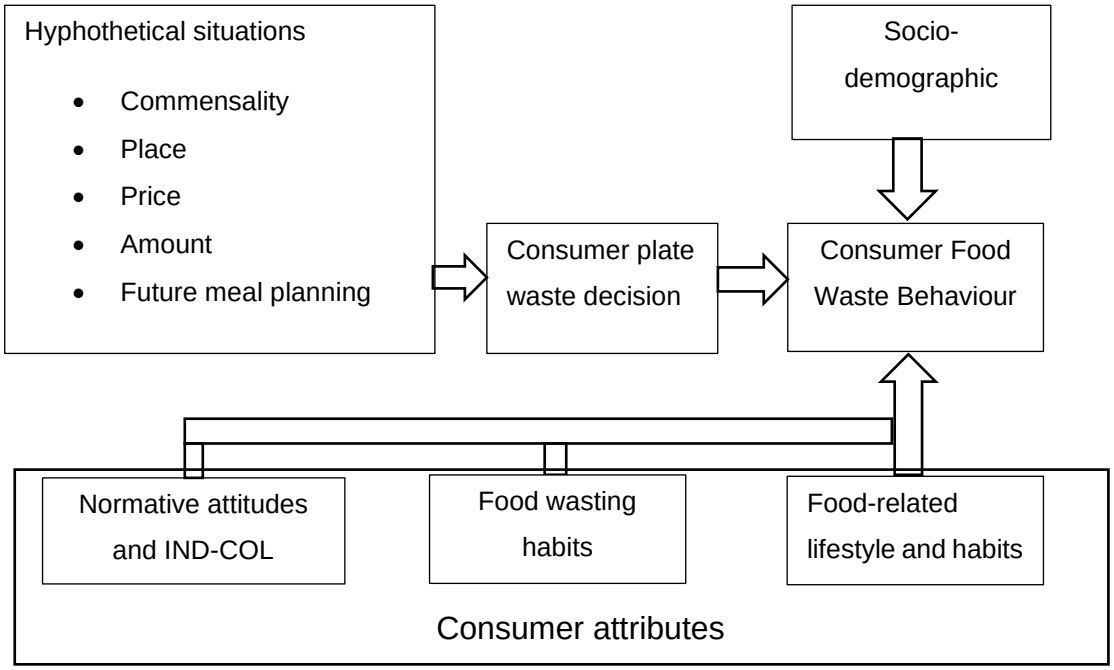


Figure 10 Conceptual framework for the quantitative study of CFW behaviour

4.2.1 Vignette experiment

We applied a vignette experiment (VE) study to examine CFW decisions about leftover food from a meal. The VE is used to reveal stated preference (Hainmueller et al., 2015). VE is a methodology often used in social sciences, psychology, marketing, management, and economics to study how people make decisions and to elicit their preferences between choices (Alexander and Becker, 1978; Hainmueller et al., 2015). It is also used to reveal respondents' beliefs, attitudes, or behaviour (Steiner et al., 2016). Atzmüller and Steiner (2010) define a vignette as "a short, carefully constructed description of a person, object, or situation, representing a systematic combination of characteristics" (p. 128). Formats of the vignette (or a "profile") could be in the form of text, images, or video (Atzmüller and Steiner, 2010; Aguinis and Bradley, 2014). Therefore, a vignette is a short story that can be in any form such as a paragraph describing a situation, a picture, or a video clip. Respondents are exposed to this description, which reflects realistic situations (i.e., scenarios) (Aguinis and Bradley, 2014). They are asked to uncover their opinions or judgements (e.g., beliefs or attitudes) (Atzmüller and Steiner, 2010; Aguinis and Bradley, 2014). Vignettes in VE (i.e., a factorial survey), consist of factors complying with objectives of the study and are systematically varied in levels (i.e., factorial combination) (Steiner et al., 2016).

Therefore, in addition to a basic survey question consisting a singular factor, one of the advantages of using the VE is researchers are able to investigate more than one factor at the same time.

In addition, VE integrates the conventional survey with experimental characteristics to gain both internal and external validity (see Atzmüller and Steiner (2010) and Steiner et al. (2016)). As a result, VE includes dominant characteristics from both research aspects (i.e., classical and experimental). There are advantages of using VE. First, vignettes in VE are closer to real situations because of the multi-factors used in a vignette and as Steiner et al. (2016) mentioned, vignettes can be “a welcome relief from monotonous survey questions” (p. 53). Therefore, not only a single vector but interaction effects between factors can also be examined. This will be in line with the objectives of this project because dining is an “event” that involves more than one factor (Cheng et al., 2007). Asking a question about CFW in a survey question can be too vague for consumers to answer because respondents can interpret the term CFW or FW differently (Ellison and Lusk, 2018). For example, some people may perceive giving leftover food to pets as CFW while others may not consider this to be CFW behaviour (Porpino et al., 2015; Fonseca, 2013). Observing consumers in the actual dining event would be an ideal way of gaining knowledge about CFW behaviour. However, this would be time consuming and would also rely on the observer’s experience (Wansink, 2004). Therefore, using the VE technique provides more realistic scenarios in a survey when compared with a traditional questionnaire. Since the VE tends to involve multiple factors to make the vignette as realistic as possible, the number of vignette populations can be too large for each respondent to be judged (Atzmüller and Steiner, 2010). Hence, researchers must systematically select subsamples of the vignettes to present to the respondents (Atzmüller and Steiner, 2010).

Second, as mentioned above, the vignettes can be in any format, and hence they can also be used as a projective technique; giving opinions from the third person point of view (Storey et al., 2014). For example, the subject of the vignette could be another person that plays a role, and a question would ask what a survey taker would do. Thus, respondents can express their opinion that might not necessarily be socially acceptable when research involves a sensitive topic (Vidal et al., 2013; Storey et al., 2014). For example, Holman et al. (2016) used a projective technique by implementing pictorial vignettes to elicit sexual judgement in Mozambique. In this project, we do not

treat a dining situation as a sensitive topic, and therefore, we do not need to frame our VE based on the third person's point of view (Vidal et al., 2013; Storey et al., 2014).

While VE presents many advantages, there are disadvantages or limitation of using this research methodology. First, as mentioned earlier, the vignette imitates the real-life situation and therefore involves multiple factors, and the interaction between factors could be too many (Alexander and Becker, 1978; Atzmüller and Steiner, 2010; Hainmueller et al., 2015). This can complicate the result interpretation. Furthermore, participants might find it either difficult to contemplate a more complex vignette or not relevant to them (Atzmüller and Steiner, 2010). We overcame this challenge by using factorial experimental design and randomised incomplete block design. The design of the experiment will be explained in the following section. Second, not every scenario are relevant to every respondent (Aguinis and Bradley, 2014). For example, it might be a rare occasion for some people to eat out. This disadvantage has been solved by asking respondents to reflect on what they would do rather than what they actually behave.

4.2.1.1 Design of the Experiment

Table 3 Variables and levels for the factorial design

Variables	Levels
Commensality	Eating alone
	Eating with significant others
Meal cost	100 Baht (£6)
	500 Baht (£30)
Place of dining	At home
	Out-of-home
Amount of leftover	Half
	Whole
Future meal plan	No plan
	With plan

The experiment followed approaches of randomised incomplete block design using Minitab® Statistical Software v. 17.0 (Minitab, LLC.)[16] which will be explained in detail in the following section. The focus is on consumer's decision to save the leftovers

[16] MINITAB® and all other trademarks and logos for the Company's products and services are the exclusive property of Minitab, LLC. All other marks referenced remain the property of their respective owners. See minitab.com for more information.

because it is one of the methods for FW reduction at the consumption level (Quested, Ingle, et al., 2013; Stancu et al., 2016). In this project, the VE is based on a 2^5 factorial design in balanced incomplete blocks. Therefore, there are five factors with two levels each, as presented in Table 3.

Meal cost, place of dining, amount of leftovers, and future meal plan were adapted from Ellison and Lusk (2018) based on Becker's (1965) household production model. The background idea is based on household utility maximisation, and it is a function of costs (such as food ingredients and opportunity cost to forgo) to prepare a new meal (Becker, 1965; Chin, 2008; Ellison and Lusk, 2018). Moreover, even though consumers do not cook but eat out, time spent in a restaurant would account for the total cost of that meal (Atkinson and Deeming, 2015). Therefore, the decision to save or not to save leftover food lies on the assumption that consumers would or would not want to forgo the costs for the food preparation to maximise the utility (Lusk and Ellison, 2017; Clark and Manning, 2018; Ellison and Lusk, 2018). When there is enough food, and there is no plan for the next meal, consumers can save cost and time by saving the food to consume later. Meal costs are based on the average restaurant price in the UK and in Thailand (Office for National Statistics, 2018; Thailand National Statistical Office, 2018). Approximate equivalence of meal prices for the UK and Thailand within the same level (i.e., £6/100 Baht and £30/500Baht) is based on the Purchasing Power Parity (PPP) conversion factor for private consumption from the World Bank database at the time we constructed the survey (in 2018) (World Bank, 2018b).

However, having people in a dining situation may affect how consumers make CFW decisions, and this may well produce a different outcome from when they eat alone (Hofstede et al., 2010; Cheng et al., 2007; Wang et al., 2016; Aschemann-Witzel et al., 2019). Eating is one of the routine practices in life which often comes with normative expectation (e.g., what consumers should or should not do as expected by people in a society) and this expectation is varied across social groups (Cheng et al., 2007). Norms in food consumption also tend to be distinctive in each country (Hofstede et al., 2010; Aschemann-Witzel et al., 2019; Soma, 2019). For example, some consumers might make their food choices to serve their own lifestyle whereas some other consumers' choices might depend on other people's approval (i.e., controlled by family members) (Furst et al., 1996; Hofstede et al., 2010). Previous empirical findings suggested that this normative expectation has an influence of CFW behaviour (Stefan et al., 2013; Farr-Wharton et al., 2014; Graham-Rowe et al., 2015; Qi and Roe, 2016; Stancu et al., 2016; Delley and Brunner, 2017; Lorenz, Hartmann, Hirsch, et al., 2017; Aschemann-

Witzel et al., 2019). The commensality was developed and added to the vignette as social pressure.

The full factorial design consists of all possible combinations of the variables and the levels. Therefore, the vignette universe for the full factorial consists of 32 vignettes (N_u= 32). With this factorial experiment, the combined effect of two or more variables can be studied (Winer, 1971). Auspurg and Hinz (2015) recommended approximately five to nine scenarios assigned to a factorial survey to gain a higher consistency of answers. Since 32 scenarios were too many for a respondent to handle, the scenarios were systematically grouped into four blocks, and there were eight vignettes in each block. Each respondent was randomly administered with one of these sets of eight scenarios to avoid the risk of respondent fatigue and unintended answers (Sauer et al., 2014; Auspurg and Hinz, 2015). Respondents would be less fatigued and prone to less stress in the incomplete block design (Graham and Cable, 2001).

Table 4 presents block numbers and scenarios factors. Steiner et al. (2016) argued that their respondents, who encountered nine scenarios using a ranking method, were not too tired to complete their task and the nine vignettes were presented at the same time. Using a randomised incomplete block factorial design, the 32 vignette population is systematically separated into four blocks of eight vignettes each[17]. Therefore, in this case, eight vignettes should not create a frustrating task for respondents.

Table 4 The 32 scenarios from 2^5 factorial design in balanced incomplete blocks

Block	Attributes				
	Commensality	**Meal cost**	**Place of dining**	**Amount of leftover**	**Future meal plan**
1	Alone	100฿ (£6)	At home	Half	No plan
1	Alone	100฿ (£6)	At home	Whole	With plan
1	with others	500฿ (£30)	At home	Whole	With plan
1	Alone	500฿ (£30)	Out at a restaurant	Whole	No plan
1	Alone	500฿ (£30)	Out at a restaurant	Half	With plan
1	With others	500฿ (£30)	At home	Half	No plan

[17] Minitab 18 was the computer programmed I used to generate blocks of the vignettes systematically. The confounded three-way and four-way interaction effects with the set effects used in the system to split the blocks are Presence x Cost x Place, Place x Amount x Meal Plan, and Presence x Cost x Amount x Meal Plan.

Table 4 The 32 scenarios from 25 factorial design in balanced incomplete blocks (continue)

Block	Attributes				
	Commensality	**Meal cost**	**Place of dining**	**Amount of leftover**	**Future meal plan**
1	With others	100฿ (£6)	Out at a restaurant	Half	With plan
1	With others	100฿ (£6)	Out at a restaurant	Whole	No plan
2	Alone	500฿ (£30)	At home	Whole	With plan
2	With others	100฿ (£6)	At home	Half	No plan
2	Alone	500฿ (£30)	At home	Half	No plan
2	With others	100฿ (£6)	At home	Whole	With plan
2	Alone	100฿ (£6)	Out at a restaurant	Whole	No plan
2	With others	500฿ (£30)	Out at a restaurant	Half	With plan
2	Alone	100฿ (£6)	Out at a restaurant	Half	With plan
2	With others	500฿ (£30)	Out at a restaurant	Whole	No plan
3	With others	500฿ (£30)	At home	Half	With plan
3	With others	100฿ (£6)	Out at a restaurant	Half	No plan
3	Alone	500฿ (£30)	Out at a restaurant	Half	No plan
3	Alone	100฿ (£6)	At home	Whole	No plan
3	Alone	100฿ (£6)	At home	Half	With plan
3	With others	500฿ (£30)	At home	Whole	No plan
3	Alone	500฿ (£30)	Out at a restaurant	Whole	With plan
3	With others	100฿ (£6)	Out at a restaurant	Whole	With plan
4	Alone	100฿ (£6)	Out at a restaurant	Half	No plan
4	Alone	500฿ (£30)	At home	Whole	No plan
4	With others	500฿ (£30)	Out at a restaurant	Whole	With plan
4	Alone	100฿ (£6)	Out at a restaurant	Whole	With plan

Table 4 The 32 scenarios from 25 factorial design in balanced incomplete blocks (continue)

Block	Attributes				
	Commensality	**Meal cost**	**Place of dining**	**Amount of leftover**	**Future meal plan**
4	With others	500฿ (£30)	Out at a restaurant	Half	No plan
4	With others	100฿ (£6)	At home	Whole	No plan
4	With others	100฿ (£6)	At home	Half	With plan
4	Alone	500฿ (£30)	At home	Half	With plan

Each vignette will read as follows:

> Please read the following 8 situations and rank each of the 8 situations from 1 to 8 by putting a number in a box, where
>
> 1 = the most likely to save the remaining dinner and
>
> 8 = the most likely to throw away the remaining dinner.
>
> *"Imagine you have just finished eating dinner **[alone/with others] [at home/out at a restaurant]**. The meal costs about **[100 ฿ (£6)/ 500 ฿ (£30)]** per person. You're full, but there is still food left on the table enough for a **[half/whole]** lunch tomorrow. You **[don't/already]** have meals planned for lunch and dinner tomorrow."*

The above ranking required respondents to fully rank all eight dining situations. One might argue that some scenarios are not relevant to some consumers such as dining in a restaurant (Palma, 2017) and, therefore, partial rankings, e.g., rank only four situations out of eight in total, could be more appropriate. The question is how many alternatives would be preferable for partial rankings, especially when comparing two consumer groups, i.e., British and Thai people. The partial ranking method requires respondents to equally rank the same number of choices (Palma, 2017). However, peoples' responses differ depending on the various styles of dining. Some might care about one dining situation, whereas other people might consider every alternative. In this study, the factors of interest and the main body of the vignette imitate the basic lifestyle. The vignette approach properties also help to overcome argument because it asks consumers to reflect on what they would do rather than

reporting their actual behaviour. Therefore, the full ranking method is deemed to be more appropriate because everyone will rank with the same number of situations between most likely save and most likely waste.

4.2.2 Population, respondents, and sampling methods

The population in this research are consumers in Thailand and the United Kingdom. We aimed to recruit 200 consumers per country (n = 200) for 400 respondents in total (N = 400). Respondents were from an online panel (via Qualtrics, Provo, Utah, USA) so that the sampling is based on a non-probability sampling method using quotas. Because the main interest of this study is to compare the two countries, the quota sampling method was implemented based on equal proportions of age and gender groups. Only participants who live in the UK with British citizenship and live in Thailand with Thai citizenship were included in the survey for the UK and Thailand, respectively. Moreover, the inclusive age range is from 18-75 years old. This is because they are mature to make their own choice about food consumption.

Table 5 shows statistical information of both countries from the latest national census report of Thailand (2010) and UK (2011).

Table 5 Population of Thailand and UK based on gender and age group

Demographic		UK[18]		Thailand[19]	
		Population	**Percentages**	**Population**	**Percentages**
Gender	Male	30,959,267	49%	32,432,367	49%
	Female	32,222,911	51%	33,756,136	51%
Age	18-46 years	25,096,436	40%	28,323,800	43%
	47-75 years	20,187,314	32%	20,119,366	30%
Total population		63,182,178		66,188,503	

Table 6 presents the quotas of the respondents for this study for each country.

[18] UK's latest census in 2011 (Office for National Statistics of UK, 2011)
[19] Thailand's latest census in 2010 (National Statistical Office of Thailand, 2010)

Table 6 Sampling quota for Thailand and UK

Demographic		UK (n=200)	Thailand (n=200)
Male	18-46 years	50	50
	47-75 years	50	50
Female	18-46 years	50	50
	47-75 years	50	50

4.2.3 Questionnaire survey and data collection

There are five parts in the questionnaire: 1) vignette experiment (VE); 2) norms; 3) Individualism-Collectivism (IND-COL); 4) food-related lifestyle and habits, 5) CFW behaviour and 6) socio-demographic. The survey pre-test was carried out in September 2018 with 50 consumers in each country. After that, the data collection to meet the total number of respondents took place during December 2018. The questionnaire was generated using Qualtrics online software, version September 2018 (Qualtrics, Provo, Utah, USA).

4.2.4 Questionnaire translation and validation

The questionnaire was given in English for UK consumers and in Thai for Thai consumers. The questionnaire was initially designed in English before being translated to Thai. The method used to validate items in Thai was inspired by Rovinelli and Hambleton (1976) who invented an index of item-objective congruence approach[20] which is used to indicate if contents (e.g., questions in an exam) comply with objectives (e.g., purposes of a lesson). This step has been used by other survey research carried out in Thai based on English questionnaire items (Turner and Carlson, 2003; Tantitaweewattana, 2015; Sakunpong et al., 2015).

In this translation part of the project, the objective is to ensure the compatibility between two languages of the same questions (Tantitaweewattana, 2015). Tantitaweewattana (2015) used this method to create a Thai questionnaire regarding social norms originally from a survey written in English. Procedures involve three steps. First, the questionnaire was translated from English to Thai by a researcher. Second, specialists

[20] This method is often used in the research field of education.

in the field were asked to rate to what extent the sentences in the Thai language are in harmony with the English version by giving them a list of questionnaire items in both languages (Sakunpong et al., 2015; Tantitaweewattana, 2015). The aim was for the accuracy and the simplicity of the language for general Thai consumers to be able to understand the translated version. Therefore, five people from different backgrounds, but with experience in the fields of food, consumer studies, psychology, marketing, and language usages, were involved in the panel and were so-called “specialists” or “judges” in this step. They are, a freelance translator with a work background in business and marketing, a psychology graduate with a food product development background, a consumer service design researcher, an import-export coordinator, and a marketer who works in a mass communication industry. Then, they were asked to score each statements or sentences +1, 0, or -1. The meanings of each score are as follows;

+1 = correct, clearly understood, and most importantly in harmony with the English.

0 = not sure or cannot make a decision.

-1 = incorrect language, not clearly understood, or not in harmony with the English.

They were also asked to put their comments and a recommended version particularly if they scored 0 or -1. The cut-off point, where that statements need to be reviewed or changed, is when the average score of that sentence is 0.5 (Rovinelli and Hambleton, 1976; Sakunpong et al., 2015; Tantitaweewattana, 2015). In other words, if the average score is less than 0.5, that statement is rephrased by referring to the panel’s suggested versions. The main advantage of this method is having more than two opinions, researcher’s and translator’s, towards the translation. However, this approach is time consuming due to the involvement of many people in the process. Moreover, different people might have different styles or preferences in choosing words. However, this challenge was overcome by reminding the judges of the main purpose of the task which is to find easy language with the correct meaning for respondents but not language that is too formal or too academic.

Last, the judges sent their judgement and comments to researchers to adjust the language. In addition to these steps, the Thai questionnaire was translated back to English to ensure consistency in the meaning.

4.2.5 Consumer attributes

Consumer attributes formed another part of the survey that follows the VE section. Questions were trying to reveal norms, Individualism-Collectivism (IND-COL), food and FW habits, and consumer demographics.

4.2.5.1 Norms

In the Theory of Planned Behaviour (TPB), norms have an influence on a person's intention to perform a behaviour (Ajzen, 1991). In Schwarz's Norm Activation Model (NAM), behaviour is explained by altruism which has a link with personal and moral norms (Schwartz, 1977). Since CFW behaviour is a complex discipline, both normative attitudes contribute to an action related to wasting food. Therefore, norms as a factor affecting behaviour in this study were operationalised by measuring moral norms (Qi and Roe, 2016), injunctive norms (Stefan et al., 2013; Stancu et al., 2016; Georgantzis et al., 2017), and personal normative attitudes (Schwartz, 1977; Lally et al., 2011; Georgantzis et al., 2017). Respondents were asked to rate statements as shown in Table 7 on an agree-disagree seven-point Likert scale.

Table 7 Moral norms, injunctive norms, and personal normative attitudes scales and items

Factors and items	Sources
Moral Norms *Scale: Strongly disagree (1) to strongly agree (7)*	
Wasting food would….	
…make me feel guilty about other people who do not have enough food to eat.	Adapted from Stancu et al. (2016)
…make me feel guilty about food producers who produce food for me.	Developed
…make me feel guilty about the environment.	Stancu et al. (2016)
…give me a bad conscience.	Stancu et al. (2016)
Injunctive Norms *Scale: Strongly disagree (1) to strongly agree (7)*	
Most people who are important to me think that one should….	
…never waste food after meals.	Adapted from Doran and Larsen (2016) and Stancu et al. (2016)
…reuse leftover food (e.g., reheat the leftovers or cook a new meal from the leftovers).	Adapted from Doran and Larsen (2016) and Stancu et al. (2016)
…not harm the environment with food waste from meals.	Adapted from Doran and Larsen (2016) and Stancu et al. (2016)

Table 7: Moral norms, injunctive norms, and personal normative attitudes scales and items (continue)

Factors and items	Sources
Personal Normative Attitudes *Scale: Strongly disagree (1) to strongly agree (7)*	
I think one should….	
…never waste food after meals.	Adapted from Doran and Larsen (2016) and Stancu et al. (2016)
…reuse leftover food (e.g., reheat the leftovers or cook a new meal from the leftovers).	Adapted from Doran and Larsen (2016) and Stancu et al. (2016)
…not harm the environment with food waste from meals.	Adapted from Doran and Larsen (2016) and Stancu et al. (2016)

4.2.5.2 Individualism-Collectivism (IND-COL)

Individualism (IND) and collectivism (COL) are culture types described by Singelis et al. (1995) and Hofstede et al. (2010). People in individualist cultures are believed to regard their own benefits as the priority whereas people who live in collectivist cultures are more group-oriented (Hofstede et al., 2010; Sun et al., 2014). Hofstede et al. (2010) found that consumption patterns between the two cultures are different. While the goal in individualist consumption patterns is for individual lifestyle, the patterns of consumption in the collectivist community tend to depend on other people. Furst et al. (1996) called this variety of interpersonal relationship as “social framework”.

In order to measure this cultural aspect of the respondents, it is necessary to acquire a great range of information from them (Singelis et al., 1995). In this section, a reduced construct created by Sivadas et al. (2008) and containing 14 items measuring individualist-collectivist culture (Table 8). The scale was developed from a full 32-item (Singelis et al., 1995) and a previously reduced 16-item questionnaire (Triandis and Gelfand, 1998). The reduced version of 14 items was used instead of the longer version because this part of the survey seeks the linkage between consumer cultural characteristics and CFW behaviour. The shorter version is, according to Sivadas et al. (2008), particularly useful for the purposes of “cross-cultural marketing and consumer research” (Sivadas et al., 2008). There are two main terms (IND and COL) which can be expanded into four different types of cultures which are: Horizontal Individualism (HI), Vertical Individualism (VI), Horizontal Collectivism (HC), and Vertical Collectivism

(VC) (Singelis et al., 1995; Triandis and Gelfand, 1998)[21]. The term “horizontal” suggests the equality among members whereas the “vertical” means people in that community accept hierarchy or inequality in society more than the horizontal type (Singelis et al., 1995; Triandis and Gelfand, 1998). The answers are based on an agree/disagree seven-point Likert scale.

Table 8 An individualist-collectivist scale and indication of IND-COL

Items	IND-COL
My happiness depends very much on the happiness of those around me.	HC
I would do what please my family, even if I detested that activity.	VC
I usually sacrifice my self-interest for the benefit of my group.	VC
I enjoy working in situations involving competition with others.	VI
The well-being of my co-workers is important to me.	HC
I enjoy being unique and different from others in many ways.	HI
Children should feel honoured if their parents receive a distinguished award.	VC
I often “do my own thing”.	HI
Competition is the law of nature.	VI
If a co-worker gets a prize, I would feel proud.	HC
I am a unique individual.	HI
I would sacrifice an activity that I enjoy very much if my family did not approve of it.	VC
Without competition, it is not possible to have a good society.	VI
I feel good when I cooperate with others.	HC

4.2.5.3 Food-related lifestyle and habits

This part combined two types of questionnaire items revealing consumer food habits and lifestyle. First, to collect the consumer food habit data, there are various types of questions in this section consisting of ordinal, categorical, and interval data. Those are, for example, places of food shopping, average expenditures on food, frequency of cooking or going out for dining, and habits of taking leftover food home. Second, to measure the food-related lifestyle, items were purposefully chosen from a large set of questions from a valid cross-country lifestyle survey long-established by Grunert et al. (1993), Ryan et al. (2004), and Buckley et al. (2007). Moreover, the items were specifically selected with respect to FW (Mallinson et al., 2016; Aschemann-Witzel, de Hooge, et al., 2018). The questions are based on the knowledge gained from the

[21] Examples of countries are Denmark (HI), The US (VI), China (HC), and India (VC) (Sivadas et al., 2008)

previous stages of the literature review. Therefore, some items were developed and added into this section. The language of the statements was adjusted to the current situation in order to be comprehensible by respondents. The arrangement of this section follows the CFW behaviour determinants framework (see Chapter 2) which shows groups of behaviour from acquiring to wasting food. Alongside other food habit questions, the food related lifestyle statements and sources of questions in this food habits section are shown in the following Table 9.

Table 9 Food-related lifestyle and habit items and sources[22]

Questions / Statements	Sources
Food Shopping Habits	
Are you responsible for food shopping in your household? (Always, Sometimes, Never)	Developed
Where do you usually buy food products to cook or prepare at home? (Supermarket/hypermarket, Farmers' market/local fresh market, Grocery shop/greengrocers, Corner/convenience shop)	Developed
On average per week, how much do you spend on food to cook at home for your household? (For UK: £0 - £10, £11 - £20, £21-£30, £31-£40, £41-£50, £51-£60, £61-£70, More than £70, I do not know. For Thailand:0-150฿, 151-300฿, 301-450฿, 451-600฿, 601-750฿, 751-900฿, 901-1,050฿, More than 1,050฿, I do not know)[23]	Developed
Storing	
In general, I often keep food items in right conditions (e.g., in a fridge) so they will last. (7-point Likert scale of agree-disagree)	Stancu et al. (2016)
Food kept for a long time is not fresh and I do not want to eat it. (7-point Likert scale of agree-disagree)	Developed
Planning	
I always plan what I am going to eat a couple of days in advance. (7-point Likert scale of agree-disagree)	Aschemann-Witzel, de Hooge, et al. (2018)
What I am going to have for dinner is very often a last-minute decision. (7-point Likert scale of agree-disagree)	Grunert et al. (1993)

[22] For "developed" items, the statements were created from the knowledge gained by the literature review and the in-depth interview in the previous study.

[23] We converted any monetary choices in the survey questions from £ to ฿ using Purchasing Power Parity (PPP) conversion factor for private consumption from the World Bank database at the time we constructed the survey (in 2018) (World Bank, 2018)

Table 9 Food-related lifestyle and habit items and sources (continue)

Questions / Statements	Sources
Cooking	
How often do you cook at home (Never, Less than once a month, 1 to 3 times per month, once a week, 2 to 3 times per week, 4 to 5 times per week, everyday)	Developed
On average each time, how long does it take to cook at home for lunch or dinner? (0-10, 11-20, 21-30, 31-40, 41-50, 51-60, 61-90, 91-120, 121-150, More than 150 minutes)	Developed
Do you have any of this kitchen equipment at home? (Microwave, Fridge, Freezer, Stove/hob, Oven, None of them)	Developed
I re-use leftover foods to make new meals. (7-point Likert scale of agree-disagree)	Aschemann-Witzel, de Hooge, et al. (2018)
Eating	
With whom do you most often have your meals? (Alone, Friends, Family members, Colleagues, Partner, Other…)	Developed
Certain members of the family have different tastes in food from the rest of the family. (7-point Likert scale of agree-disagree)	Ryan et al. (2004) and Mallinson et al. (2016)
Certain members of the family are choosy about what they eat. (7-point Likert scale of agree-disagree)	Ryan et al. (2004) and Mallinson et al. (2016)
When eating dinner, the most important thing is that everyone (e.g., family or friends) is together. (7-point Likert scale of agree-disagree)	Grunert et al. (1993) and Aschemann-Witzel, de Hooge, et al. (2018)
I eat before I get hungry, which means that I am never hungry at mealtimes. (7-point Likert scale of agree-disagree)	Grunert et al. (1993)
I eat whenever I feel the slightest bit hungry. (7-point Likert scale of agree-disagree)	Grunert et al. (1993)
At home, snacking is more common than set mealtimes. (7-point Likert scale of agreement or disagreement)	Mallinson et al. (2016)
At home, I often serve myself too much food than I can finish. (7-point Likert scale of agree-disagree)	Developed
Eating out	
How often do you eat out (e.g. at a restaurant etc.)? (Never, Less than once a month, 1 to 3 times per month, once a week, 2 to 3 times per week, 4 to 5 times per week, everyday)	Developed
Where do you usually go when you eat out? (Fast food restaurants, Street food shops, Canteen/cafeteria, Casual dining place, Formal dining place, Café, other….)	Adapted from Euromonitor International (2018)
Going out for dinner is a regular part of my eating habits. (7-point Likert scale of agree-disagree)	Grunert et al. (1993)
I enjoy going to restaurants with family and friends. (7-point Likert scale of agree-disagree)	Grunert et al. (1993)

Table 9 Food-related lifestyle and habit items and sources (continue)

Questions / Statements	Sources
When eating out, I often order too much food for myself more than I can finish. (7-point Likert scale of agree-disagree)	Developed
How often do you take leftovers home when you are eating out? (Never, Rarely, Occasionally, Sometimes, Frequently, Usually, Every time)	Developed

4.2.5.4 CFW behaviour and food-wasting habits

In addition to the food-related lifestyle and habits, we had another section to obtain more information about CFW behaviour particularly in relation to a meal setting and food-wasting habits as shown in Table 10.

Table 10 Food wasting habits and CFW behaviour items and sources

Questions / Statements	Sources
CFW Behaviour	
In your opinion, how often do other people around you have food left on their plate to be discarded after a meal in general?	Adapted from Lally et al. (2011) and Di Noia and Cullen (2015)
How often do you have food left on your plate to be discarded after a meal?	Adapted from Di Noia and Cullen (2015)
Wasting	
I hate it when I need to throw food in the bin. (7-point Likert scale of agreement or disagreement)	Aschemann-Witzel, de Hooge, et al. (2018)
As long as there are still hungry people in this world, food should not be thrown away. (7-point Likert scale of agreement or disagreement)	Aschemann-Witzel, de Hooge, et al. (2018)
I would rather have a second helping than leave food on my plate. (7-point Likert scale of agreement or disagreement)	Aschemann-Witzel, de Hooge, et al. (2018)
In general, for food with a “Best Before” date, it is better to throw it away if the date has passed than to risk eating it. (7-point Likert scale of agreement or disagreement)	Inspired by Principato et al. (2015)

Ellison and Lusk (2018) mentioned that asking consumers to indicate the percentage of the food they waste would be too confusing because each person has their own understanding and description of FW. We therefore chose to focus on the frequency of the behaviour focusing on a meal setting and asked two questions adapted from

Lally et al. (2011) and Di Noia and Cullen (2015). First, we asked about consumer's perception of other people food-wasting habits in their society. Second, we aimed to get respondents to report their behaviour. A seven-point Likert scale of the frequency with never-every time alternatives was used. Mollen et al. (2013) found that consumers generally like to comply with society and they therefore tend to behave in the same way they think other people do. Lally et al. (2011) also used questions similar to these to uncover descriptive norms in healthy food consumption. Food wasting habits data were collected in a similar pattern as the food-related lifestyle and habits using a seven-point Likert scale of agree-disagree.

4.3 Data analysis

The analysis of the data in this project has two parts. First, the characteristics of our respondents were analysed by using descriptive statistics. We compared all consumer attributes (i.e., socio-demographic, normative attitudes, IND-COL, food-related lifestyle and habits, and CFW behaviour) between UK and Thai consumers as well as pooled data of both countries. Then, in the second part, we present the analysis of the VE data. Before the actual analysis, the quality of the data was checked by removing unused data.

4.3.1 Data quality check

Each dataset, UK and Thailand, was examined and checked to ensure the data was reasonably useable. In other words, after obtaining datasets from Qualtrics, the data were checked. Additionally, straight-lining answers[24], unusable data, and respondents with missing data were removed (5.45% of the UK and 5% of the Thailand respondents).

In terms of straight-liners (3.18% of the UK and 3.64% of the Thailand respondents), responses from a consecutive set of questions with the same scale such as seven-point Likert scale in moral norm, injunctive norm, personal attitude, and part of food-related lifestyle sections were grouped. After that, standard deviations (SD) of those question sets for each respondent were calculated (Barge and Gehlbach, 2012). If the

[24] Straight line answers are from respondents who constantly chose the same answers for consecutive questions, particularly the questions with the same scale such as seven-point Likert scale of agreement. This is assumed to be unintended or random answers.

SD was equal to zero, the respondents were suspected as straight liners (Barge and Gehlbach, 2012; Leiner, 2013).

Although it can be possible that a person has the same opinion for many questions, it is questionable if this is the case in every section, particularly for the cultural personality construct. There were seven SDs calculated per respondent. A person, who scored zero SD for four times or more, were removed from the dataset. Most of the removed respondents were extreme cases such as people who answered the same answers and the SD showed five to six times for the zero value.

The unusable data was one Thai respondent who answered 41 for the household number and the missing data is a group of respondents who had no answers for the VE part due to a glitch in the online system.

4.3.2 Descriptive statistics and reliability

Attributes and characteristics of consumers were analysed by using a descriptive statistical test, including percentages and mean. These include data about socio-demographic, normative attitudes, food-related lifestyle and habits, and CFW behaviour. Significant differences compared between the UK and the Thai groups were determined by non-parametric test Kruskall-Wallis if the data were ordinal, and Chi-square if the data were nominal (Asioli et al., 2019). STATA 15.0 software (StataCorp LP, College Station, US) was used for carrying out this analysis. Kruskall-Wallis is a non-parametric approach to test differences of medians between two groups or more (Thai and UK groups in this thesis) from ordinal data type (Ruxton and Beauchamp, 2008; Hoffman, 2019). This method was selected because it does not assume the data are normally distributed (Hoffman, 2019). Chi-square test is a non-parametric statistic tool used to analyse mean differences between groups when the dependent variables are nominal data (McHugh, 2013). Moreover, Cronbach's alpha (α) was performed to test internal reliability of normative attitudes and IND-COL items using SPSS Statistics 17.0 (SPSS Inc., Chicago, US).

4.3.3 Vignette experiment

Data analysis of the VE is based on two steps. First, we performed a descriptive analysis. Second, we used a discrete choice model. There are models that are suitable for analysing ranking data such as a rank-ordered logit model, which was developed

from a logit model, and a mixed logit model. The sections will begin with the descriptive analysis explanation. After that, the basic concepts which are logit model, rank-ordered logit model, and rank-ordered mixed logit model are shown afterwards.

4.3.3.1 Descriptive statistics for vignette experiment

Prior to conducting a more sophisticated analysis of ranking data, carrying out analysis of descriptive statistics should provide direction for estimating the data appropriately (Alvo and Yu, 2014).

We used mean rank to measure popularity of each meal scenario. The measurement provides the information about central tendency of the ranking scores. The mean of the ranking score, m, of the i^{th} vignette situation (i = 1, 2…., 32 situations) is defined in Eq. 1 as follows;

$$m_i = \sum_{j=1}^{8} n_j v_j(i)/n \qquad \text{Eq. 1}$$

where v_j = all possible ranking scores from 1 to 8 of the i^{th} vignette situation, n_j = frequency of rank j given by respondents for that i^{th} vignette situation and, n = number of observations ranking the i^{th} vignette situation

4.3.3.2 Discrete choice model

A dependent variable that is based on ranking data is often analysed using logistic regression models (Train, 2009; Hensher et al., 2015). The logit model is one of the "first-generation" models for qualitative choice analysis (Train, 2009) and is one of the discrete choice models used for a non-metric dependent variable (Mazzocchi, 2008; Andersson, 2015). It is derived from the assumption that all respondents have extreme value independent and identically distributed (IID) random variables which are uncorrelated and have the same variance across all alternatives (Train, 2009). The model uses logarithm transformation function to transform the odds of an occurrence (e.g., a chosen alternative) to a linear model (Rutherford, 2013).

In the simplest way for model explanation, the variable has two possible outcomes (binary), such as yes/no or pass/fail, which are often coded by using dummy or binary variables (i.e., two numbers such as "0" and "1"). Since the dependent variable (y) is not continuous, the model involves a continuous latent variable (z) which is an

unobserved continuous variable transformed from y using a logit transformation as a link function.

For the simplicity of explaining the model, a basic linear regression (Eq. 2) with a single explanatory variable (x) is used which is shown below.

$$y_i = \beta_0 + \beta_1 x_i + \varepsilon \quad \text{Eq. 2}$$

For a binary outcome, for example, two categories such as “to waste food” and “not to waste food”, y is often coded as “0” and “1” as shown below in Eq. 3.

$$y_i = \begin{cases} 0 & \text{if the i}^{th} \text{ respondent chooses "to waste food"} \\ 1 & \text{if the i}^{\text{th}} \text{ respondent chooses "not to waste food"} \end{cases} \quad \text{Eq. 3}$$

The transformation relates to the probabilities (p_i) of obtaining different values of y as a result of explanatory variable x. The p_i is defined as the probability that a respondent will choose “not to waste food” or “1”. The process is characterised by two steps. First, the odds (Eq. 4) are obtained by:

$$\text{odds} = \frac{p_i}{1-p_i} = \frac{\text{Probability of the choice "not to waste food" is chosen}}{\text{Probability of the choice "to waste food" is chosen}} \quad \text{Eq. 4}$$

Second, log-odds or logit is obtained by taking logarithms:

$$logit(p_i) = \log \frac{p_i}{1-p_i} \quad \text{Eq. 5}$$

After the transformation, the regression equation can be rewritten in the continuous latent variable form as:

$$y_i = z_i = \beta_0 + \beta_1 x_i + \varepsilon_i \quad \text{Eq. 6}$$

To determine the value of y as a function of z, there is a set threshold (δ) as follows.

$$y_i = \begin{cases} 0 \text{ if } z_i \leq \delta \\ 1 \text{ if } z_i > \delta \end{cases}$$ Eq. 7

The above suggests that the dependent variable is equal to 0 if the continuous variable is below the threshold and is equal to 1 if the transformed latent variable is more than the threshold.

This logit model is a basic concept for other models such as ordered logit or multinomial logit models (Mazzocchi, 2008; Long and Freese, 2014). The former is suitable for ordinal discrete choices and the latter is used when the outcome is a categorical but not ordered (Mazzocchi, 2008). The assumption of the error terms provide convenience for the choice probability (Train, 2009). Although the model is used widely, it has important limitations which make it unsuitable for some real-world situations and this results in lower applicability (Train, 2009). The logit model cannot account for differences of heterogeneity among decision makers (i.e., respondents). In other words, coefficients for everyone are fixed (Hensher and Greene, 2003). Moreover, the logit model also relies on the assumption of independent of irrelevant alternatives (IIA) (McAdams et al., 2015; Mokhtarian, 2016). This means a preferred choice is chosen over other choices regardless of the existence of the unchosen choices (Mokhtarian, 2016). Regarding the assumption of IID, there might be correlation between alternatives for their unobserved factors for which the logit model does not account (Train, 2009). For example, an error term could be a “feeling of guilt” that could be correlated between choices of “to waste food” or “not to waste food”. As a consequence, other methods such as a mixed logit model comes into play in hope of overcoming some of these limitations (Hensher and Greene, 2003).

We used two different discrete choice models. First, we applied the rank-ordered logit (ROL) model and the second model we used was the ranked-ordered mixed logit (ROML) model. This will be discussed in the following sections.

4.3.3.3 Rank-ordered logit (ROL)

We used the rank-ordered logit model (ROL) as one of the econometric analysis methods in our study. It is a generalisation of a conditional logit model (Long and Freese, 2014). For ranking data, in a full set of alternatives, consumers choose which they most prefer among those options. After that, the process is repeated with the remaining choices (Palma, 2017). This follows a similar idea to Thurstone’s “Law of

Comparative Judgement". Thurstone (1994), a reprinted version of Thurstone's original publication in 1927, argued that judgement is comparative. Choice is made based on relative decision, that alternative A is stronger (e.g., better, greater, or more preferred) than alternative B as a function of a set of factors (stimuli). In other words, the chosen item has the "largest value" when being compared. Later, Thurstone's approach has been adopted by psychological researchers as well as sensory scientists (Tuorila and Monteleone, 2009).

Introduced in 1981, Beggs et al. (1981) proposed the ordered logit model for individual ranking data to uncover how consumers valued electric cars when considering various product factors. This ROL model is an advanced form of the multinomial logit model (MNLM) which only takes into account the most preferred choice, not the ranking of every choice (Long and Freese, 2014; Vijfvinkel, 2017). In this study, the dependent variable is a rank outcome of each dining situation which was treated as an ordinal variable. One ranking score of each scenario from each participant is considered as one observation (Koop and Poirier, 1994). The information of the ranking orders in ROL makes the model different from the conditional logit model, which stores only the observation of the highest valued alternative.

There are some advantages from using ROL. First, the probability model specification in the ROL is more complete because it takes rank into consideration (Beggs et al., 1981). Second, the ROL reduces sampling cost because one decision maker provides more information (i.e., the ranking of partial or all alternatives) (Koop and Poirier, 1994). However, there are also some limitations based on the use of ROL. The model assumption relies on the basic concept of the decision making process (i.e., comparative judgement), starting from choosing the most preferred alternative among the offered choice (Beggs et al., 1981). This might not be the case for every respondent because some individuals could perform this in a different sequence (Nair et al., 2018). In other words, one might not have any systematic sequence in ranking at all. Moreover, respondent heterogeneity is not taken into account (Vijfvinkel, 2017). Therefore, a ranked-ordered mixed logit can overcome these challenges.

Since respondents were asked to rank all eight situations they received, the ranking scores from one person have no ties (i.e., choices that are on the same rank) and every vignette has its own ranking score. For example, sometimes respondents can be asked to rank only 3 among 8 choices. Therefore, the other 5 choices will be considered as ties. The ROL treats the method of ranking as a sequence of choice

(Long and Freese, 2014). In our study, each person, n, chooses a scenario choice from J scenarios ($1 < J < 8$) that has the highest utility or the unobserved attractiveness of a scenario, U_{nit}. The utility specification is;

$$U_{nit} = V_{nit} + \varepsilon_{nit} \qquad \text{Eq. 8}$$

where V_{nit} is a deterministic component of the model and the error term ε_{nit} is assumed to follow some distribution function. V_{nit} is explained by x_{nit} or a vector of five attributes describing scenario i for a respondent n at period t.

A respondent chooses the most preferred scenario and then chooses the next alternative based on the best choice among the remaining dining situations, $U_{nit} > \max$ if $j \neq i$ (number 1 refers to the most preferred scenario, the second preferred choice is 2 and so on) until the least preferred option is identified. Therefore, the ranking data is treated as being equivalent to a set of discrete choices in which the most preferred option is chosen from a set of options before being excluded from the possible choices, with the next one being identified as being the best from the remaining set and so on. The probability for the scenario to be selected is:

$$\Pr(U_{n1t} > U_{n2t} > \cdots > U_{njt}) = \int_{-\infty}^{\infty}\int_{-\infty}^{U_{n1t}}\int_{-\infty}^{U_{n2t}} \dots \int_{-\infty}^{U_{njt}} \mathrm{d}H\,(U_{n1t}, U_{n2t}, \dots U_{njt}) \qquad \text{Eq. 9}$$

where dH(U_{n1t}, U_{n2t},… U_{njt}) is the combined distribution of the U_{nit} generated by the distribution of the error term (ε_{nit}). If we assume that the error term is a consistent and independently distributed extreme value among respondents and scenarios, then the probability of scenario i is selected is:

$$\Pr_{nit} = \frac{\exp(V_{nit})}{\sum_{j=1}^{J}\exp(V_{njt})} \qquad \text{Eq. 10}$$

Therefore, the probability of rank orders from all choices for an individual n and alternative i at period t is:

$$\Pr\left[U_{nit1} > U_{nit2} > \cdots > U_{njt}\right] = \Pr_{nit} = \prod_{j=1}^{J-1} \frac{\exp(V_{nit})}{\sum_{j=1}^{J} \exp(V_{nit})} \quad \text{Eq. 11}$$

From our study, a respondent was given a set of eight scenarios and was asked to rank each dining situation from one (the most likely to save the remaining dinner) to eight (the most likely to throw away the remaining dinner). Suppose the vignette choices are represented by eight letters (*a*-*h*) and this person ranks:

$$d > e > h > a > c > b > f > g \quad \text{Eq. 12}$$

The utility order for this respondent can be implied as:

$$U_n(d) > U_n(e) > U_n(h) > U_n(a) > U_n(c) > U_n(b) > U_n(f) > U_n(g) \quad \text{Eq. 13}$$

Thus, ranking 8 options from “the best” to “the worst” becomes equivalent to making 7 discrete decisions (choices) over decreasing sets of options (explosion procedure) (Beggs et al., 1981). The probability of this person’s observed ranking is:

$$\begin{aligned}
&\Pr\left(d > e > h > a > c > b > f > g\right) \\
&= \frac{\exp(V_{ntd})}{\sum_{j=a,b,c,d,e,f,g,h} \exp\left(V_{ntj}\right)} \cdot \frac{\exp(V_{nte})}{\sum_{j=a,b,c,e,f,g,h} \exp\left(V_{ntj}\right)} \cdot \frac{\exp(V_{nth})}{\sum_{j=a,b,c,f,g,h} \exp\left(V_{ntj}\right)} \cdot \\
&\frac{\exp(V_{nta})}{\sum_{j=a,b,c,f,g} \exp\left(V_{ntj}\right)} \cdot \frac{\exp(V_{ntc})}{\sum_{j=b,c,f,g} \exp\left(V_{ntj}\right)} \cdot \frac{\exp(V_{ntb})}{\sum_{j=b,f,g} \exp\left(V_{ntj}\right)} \cdot \\
&\frac{\exp\left(V_{ntb}\right)}{\sum_{j=f,g} \exp\left(V_{ntj}\right)}
\end{aligned} \quad \text{Eq. 14}$$

$Vnit$ is a vector of five attributes in our study (i.e., commensality, meal cost, place of dining, amount of leftover food, and future meal plan). These five attributes are dummy variables in the model taking the value of 0 and 1 in computer programming as shown in Table 11 .

We used ROL for our data analysis using rologit command in STATA 15.0 software (StataCorp LP, College Station, US). Due to the default setting of the rologit command in the programme, the most preferred option is to be ranked with the higher number. This is different from our questionnaire scale. Therefore, we used a reverse function for the ranking score.

The ROL is fit by maximising the probability of obtaining the observed rank orders. The coefficients of this model are estimated by using the maximum likelihood (ML) method (Beggs et al., 1981).

Table 11 Attributes, levels, and codes

Attributes	Levels	Codes
Commensality	Eating alone	0
	Eating with others	1
Meal cost	100 Baht (£6)	0
	500 Baht (£30)	1
Place of dining	At home	0
	Out-of-home	1
Amount of leftover	Half	0
	Whole	1
Future meal plan	No plan	0
	With plan	1

4.3.3.4 Ranked-ordered mixed logit (ROML)

After having estimated using the ROL model, we also estimated using the Ranked Ordered Mixed Logit (ROML) which will be outlined in this section (Revelt and Train, 1998; Lancaster, 2004; Balcombe et al., 2009; Vijfvinkel, 2017).

Mixed logit, also called a random parameters model, is another model for discrete choice type of data (Train, 2009; Hensher et al., 2015; Elshiewy et al., 2017). Parameters in the model are allowed to be randomly distributed and are assumed to vary for each respondent (Revelt and Train, 1998; Liu et al., 2017). Therefore, this makes the results from ROML more realistic than the standard ROL (Vijfvinkel, 2017). ROML is a synthesis between normal categories model and a ranking model (Liu et al., 2017; Vijfvinkel, 2017). It accounts for not only observed but also latent covariates (Böckenholt, 2001). The ROML is a generalisation of the ROL in that it allows for each respondent to have their own preferences (in this case marginal utilities), where it is assumed that the overall distribution of preferences has a known distributional form

(e.g., normal distribution) (Lancsar et al., 2017). The ROML can be estimated in a classical way using Maximum Likelihood (ML) estimation (McFadden and Train, 2000) meaning that the likelihood function can be accurately simulated and has a unique maximum (Böckenholt, 2001; Lancaster, 2004; Balcombe et al., 2009). However, the classical approach, while straightforward for the ROL, can be difficult and time consuming for ROML should there be high dimensional set of options to be ordered (Böckenholt, 2001; Vijfvinkel, 2017). The recovery of individual preferences (or marginal utilities) from the ROML can also be difficult using classical methods (Chapman and Staelin, 1982; Balcombe et al., 2009).

An alternative approach to estimation of the ROML is the Bayesian approach (Huber and Train, 2001). Huber and Train (2001) compared the classical way with Bayesian methods and pointed out the attractiveness of the latter such as the inclusion of prior knowledge or investigator's beliefs. The Bayesian estimation multiplies the "full data likelihood" by prior distributions for the parameters that govern the distribution of the latent marginal utilities, and then uses Monte Carlo Markov Chain methods to simulate the distributions of the all of the parameters within the ROML including the individual marginal utilities (Lancaster, 2004). It is this approach we performed here adapted from Balcombe et al. (2009).

Formally, we assume that the n^{th} person $(n = 1,...,N)$ obtains linear utility U_{jn} from the j^{th} option $(j = 1,.....,8)$. V_{jn} is a vector of observed independent variables or the five dining attributes taking the value of 0 and 1 as shown in Table 11.

$$U_{jn} = \alpha_n V_{jn} + \varepsilon_{jn} \qquad \text{Eq. 15}$$

where ε_{jn} is the unobserved random error (independent across j and n) which is assumed to be extreme value (Gumbel) distributed, independent of V_{jn} and uncorrelated across respondents or scenarios. For the coefficient (α_n), it is unobserved latent marginal utility such that it has 1) a mean vector α with precision matrix (inverse covariance matrix) Ω which is assumed to be diagonal; or 2) a mean vector that is a linear function of covariates $z_n\alpha$ with precision matrix (inverse covariance matrix) Ω which is assumed to be diagonal.

The prior distributions are then specified for α and Ω. For the results presented here, it is assumed that α has a prior distribution that normally distributed with mean 0 and an identity precision matrix. The diagonal elements of Ω have half-normal priors.

This model is estimated using Hamiltonian Markov Chain Monte Carlo (MCMC) [25] as implemented by the program Stan. The code was provided by Savage (2018).

4.3.3.5 Model implication

We used the ROL model to indicate *significance* of main effects and interaction effects because our conceptual framework and the literature review show that CFW behaviour is affected by interconnected influence between factors. We therefore use this statistical implication to compare which factors affect which group of consumers (i.e., Thai or British). We implemented the ROML model to indicate the *existence* of the effect from each factor (Makowski et al., 2019). Incorporating full interaction effect in the fully specified mixed logit model is infeasible due to numerical and computational limitation (McKinley et al., 2015; Train, 2016). Therefore, the analysis for the ROML was conducted to observe the magnitude of individual factor.

4.4 Results

4.4.1 Consumer description: socio - demographics

Table 12 reports the summary statistics of the socio-demographic characteristics investigated (i.e., gender, age, household size, education, presence of people under 18 years old in the household, area of growing up, area of living, employment and income) across the two countries and pooled data from both countries.

To check for significant differences across the groups, we performed a Kruskal-Wallis test and chi-square test. For the convenience of result presentation, we converted the participant's age and household size, which were answered in individual number by each participant, into ranked or ordered variables. We used the non-parametric Kruskall-Wallis test with these ordered variables (i.e., age, household size, education and income). For the categorical or nominal variables (i.e., gender, presence of people under 18 years old, area of growing up, area of living and employment) we used the

[25] An algorithm of random number generator (Lancaster, 2004) used in programme Stan originally from Metropolis (1953).

chi-square test. The results show that there were no statistically significant differences in age (χ^2= 2.962 (1), p > 0.05) and gender (χ^2 (1) = 0.0023, p > 0.05) between the two groups as planned.

When compared with the UK group, Thailand respondents have larger families, a higher education level, a larger presence of people under 18 years old, growing up and living more in urban area, larger number of students, private sector and independent workers and are richer. On the other hand, respondents from UK have smaller families, lower education level, smaller presence of people under 18 years old, growing up and living more in sub-urban areas, larger number of public workers, retired and unemployed and are from lower income groups.

Table 12 Socio-demographic characteristics of the sample

Characteristics	United Kingdom (N=208)	Thailand (N=209)	Pooled (N=417)
Gender			
Female	50.48%	50.72%	50.60%
Male	49.52%	49.28%	49.40%
Pearson chi2(1) = 0.0023			
Pr = 0.961			
Age			
18-29	19.71%	25.84%	22.78%
30-41	27.40%	21.05%	24.22%
42-53	25.00%	36.36%	30.70%
54-65	21.63%	15.79%	18.71%
66-75	6.25%	0.96%	3.60%
Chi-squared = 2.962 with 1 d.f.			
Probability = 0.0853			
Household size (no. member)			
1-3	72.12%	32.06%	52.04%
4-6	26.92%	58.85%	42.93%
7-9	0.48%	8.61%	4.56%
>10	0.48%	0.48%	0.48%
Chi-squared = 70.236 with 1 d.f.			
Probability = 0.0001			

Table 12 Socio-demographic characteristics of the sample (continue)

Characteristics	United Kingdom (N=208)	Thailand (N=209)	Pooled (N=417)
Education			
Primary school	1.44%	0.48%	0.96%
Secondary school	33.17%	22.97%	28.06%
College	34.13%	14.83%	24.46%
Bachelor's degree+	31.25%	61.72%	46.52%
Chi-squared = 27.906 with 1d.f.			
Probability = 0.0001			
Presence of people under 18			
Presence	37.50%	53.11%	45.32%
Absence	62.50%	46.89%	54.68%
Pearson chi2(1) =10.2508			
Pr = 0.001			
Area of growing up			
Rural area	25.96%	28.71%	27.34%
Sub-urban	42.31%	25.84%	34.05%
Urban area	31.73%	45.45%	38.61%
Pearson chi2(2) =13.6779			
Pr = 0.001			
Area of living			
Rural area	22.60%	11.48%	17.03%
Sub-urban	50.00%	30.62%	40.29%
Urban area	27.40%	57.89%	42.69%
Pearson chi2(2) = 39.9836			
Pr = 0.0000			
Employment			
Student	5.29%	10.05%	7.67%
Independent worker	6.25%	28.71%	17.51%
Private sector worker	33.65%	37.32%	35.49%
Public sector worker	23.56%	13.40%	18.47%
Retired	11.06%	1.91%	6.47%
Unemployed seeking work	8.17%	2.39%	5.28%
Not in paid employ not seeking work	12.02%	6.22%	9.11%
Pearson chi2(6) = 63.2482			
Pr = 0.000			

Table 12 Socio-demographic characteristics of the sample (continue)

Characteristics	United Kingdom (N=208)	Thailand (N=209)	Pooled (N=417)
Income[26]			
Less than £15,000 or 100,000 Baht	19.23%	8.61%	13.91%
£15,000 - £24,999 or 100,000 – 199,999 Baht	19.23%	14.83%	17.03%
£25,000 - £34,999 or 200,000 – 299,999 Baht	21.63%	10.05%	15.83%
£35,000 - £44,999 or 300,000 – 399,999 Baht	12.98%	11.00%	11.99%
£45,000 - £54,999 or 400,000 – 499,999 Baht	8.17%	8.61%	8.39%
£55,000 - £64,999 or 500,000 – 599,999 Baht	3.37%	8.61%	6.00%
£65,000 - £74,999 or 600,000 – 699,999 Baht	6.73%	4.78%	5.76%
£75,000 - £84,999 or 700,000 – 799,999 Baht	1.34%	7.66%	4.56%
£85,000 - £94,999 or 800,000 – 899,999 Baht	0.96%	8.13%	4.56%
More than £95,000 or 900,000 Baht	0.48%	12.44%	6.47%
Chi-squared = with 43.903 d.f.1			
Probability = 0.0001			
I don't know	1.44%	1.91%	1.68%
Prefer not to say	4.33%	3.35%	3.84%
Pearson chi2(1) = 0.3500			
Pr = 0.554			

4.4.2 Normative attitudes and IND-COL

Table 13 presents mean scores and reliability test (Cronbach's alpha: α) of attitudes based on the agree/disagree seven-point Likert scale of respondent's normative attitudes and IND-COL. The mean scores are the accumulative scores of items divided by number of items in each variable. In terms of the reliability, Cronbach's alphas of all variables are above 0.7 indicating acceptable internal consistency. In a broad picture, levels of agreement toward normative attitude statements about FW among Thai

[26] Annual household income before tax. The median ranges of income are £25,000 - £34,999 (the UK), 400,000 – 499,999 Baht (Thailand), and £35,000 - £44,999 or 300,000 – 399,999 Baht (pooled data).

respondents are significantly higher than the UK group except one statement: “wasting food would give me a bad conscience”. If we looked at the mean scores between injunctive norms and personal normative attitudes, both British and Thai respondents tended to score higher for personal normative attitudes.

Table 13 Means and reliability test of normative attitudes and IND-COL

Variables	United Kingdom (N=208)		Thailand (N=209)		Pooled (N=417)	
	Mean (SD)	α	Mean (SD)	α	Mean (SD)	α
Moral norms	4.767 [a] (1.503)	0.885	5.383 [b] (1.227)	0.861	5.076 (1.405)	0.874
Injunctive norms	4.800 [a] (1.341)	0.790	5.679 [b] (0.985)	0.736	5.241 (1.254)	0.802
Personal normative attitudes	5.276 [a] (1.309)	0.814	5.928 [b] (0.948)	0.797	5.603 (1.187)	0.790
IND	4.808 [a] (0.941)	0.751	5.494 [b] (0.764)	0.745	5.152 (0.922)	0.772
HI	5.111 [a] (1.044)	0.708	5.589 [b] (0.885)	0.740	5.350 (0.995)	0.737
VI	4.832 [a] (1.108)	0.715	5.443 [b] (0.820)	0.792	5.138 (1.020)	0.700
COL	4.766 [a] (0.895)	0.775	5.454 [b] (0.752)	0.750	5.111 (.894)	0.796
HC	5.067 [a] (0.992)	0.740	5.754 [b] (0.775)	0.701	5.411 (0.953)	0.758
VC	5.743 [a] (0.104)	0.727	5.575 [b] (0.563)	0.766	5.659 (0.414)	0.735

[a,b] Different letters between the UK and Thailand results indicate a statistically significant difference at a 95% level of confidence.

In terms of IND-COL construct, respondents in our study show significant differences in their IND-COL cultures. However, not only the level of collectivism but also individualism is significantly higher for the Thai respondents than the UK respondents. Responses from both Thai and British respondents are in the same range which is between four and five on the IND-COL scale. If we investigate minor scales of the collectivism, we can distinguish different collectivist personalities among these two participant groups. Cultural personalities among Thai respondents show that they see

themselves as part of a collective group and see everyone as the same in the collective (i.e., HC). Although UK respondents see themselves as part of the collective society, they tend to be aware more about inequality in the group (i.e., VC).

4.4.3 Food-related lifestyle and habits

Food and FW related lifestyle and habits of British and Thai respondents, as well as pooled data, are shown in Table 14. Some obvious themes emerged and can be seen from this table. Respondents showed significant difference of various food and FW lifestyle and habits when the two countries were compared.

In general, the majority of respondents from both countries are responsible for food shopping for their household (UK = 79.33% and Thailand = 65.07%). Respondents from the UK spend fewer resources than Thais in terms of 1) money spent on food purchase per week (UK = £41-£50 and Thailand = more than 1,050 Baht or £70), and 2) time spent on cooking (UK = 31-40 minutes and Thailand = and 51-60 minutes). Around two thirds of Thai respondents (69.86%) mostly spend their mealtimes with family members, and it is more important for Thais to have everyone (e.g., family and friends) around whereas most UK respondents spend their mealtimes with their partners (37.98%) and having family or friends around during a mealtime is less important. Moreover, it is worth noting that the percentage of UK respondents who often eat alone (25.96%) is more than twice as high as those of Thai respondents (10.05%).

In Thailand, data from Table 14 suggest that local food businesses (e.g., farmer markets or local market) are more popular for Thai respondents than for the British ones. This is evidenced in frequent places for food shopping and eating out. In the UK, people tend to buy food from a supermarket or a hypermarket (88.78%) whereas nearly all Thai people purchase food more from a farmer's market or a local fresh market (92.72%). 66.18% of Thai participants stated that they often eat out at a street food shop whereas only 14.80% of the UK participants have meals at this type of food places.

Regarding frequency, the British respondents cook at home more and eat out less often than the Thai group. Among the UK respondents, 41.35% of them cook every day compared with 33.49% from the Thai respondents. Most Thai respondents eat out a couple of times a week whereas the British respondents do less than once a month.

However, the level of agreement towards the statement “Going out for dinner is a regular part of my eating habits” is significantly lower for Thai consumers than the British and this seems to contradict the previous figures.

Regarding overall lifestyle from the pooled dataset about storing food and planning for meals, respondents agreed that they have already kept food in the right conditions so that the food will last and there was no significant difference between British and Thai respondents. Interestingly, one statistically different lifestyle habit between respondents from these two countries shown in Table 14 is about “food kept for a long time is not fresh and I do not want to eat it.”. The mean score of this statement from British respondents (3.889 ± 1.580) is in the region of disagreement more than the Thais (4.555 ± 1.480). However, it is not so clear if the respondents are good food planners. UK respondents are significantly better organised regarding food planning than Thai respondents. Nonetheless, both British and Thai respondents stated that they did not help themselves to more food than they could eat at home nor did they order more food than they could eat at a restaurant. On the other hand, if there are leftovers at a restaurant, Thai respondents would be more likely to take them home than the British respondents. Both groups all accepted that there were family members who had different tastes and had unique food preferences in their family.

Table 14 Food and FW related lifestyle and habits

Lifestyle and Habits	United Kingdom	Thailand	Pooled
Shopping habits			
Responsibility for household food shopping			
Always	79.33%	65.07%	72.18%
Sometimes	19.23%	33.49%	26.38%
Never	1.44%	1.44%	1.44%
Pearson chi2(2) = 10.9735			
Pr = 0.004			
Shopping for food at…: Yes / No			
Supermarket or hypermarket	88.78% / 11.22% [c]	80.58% / 19.42% [d]	84.67% / 15.33%
Farmer’s market or local fresh market	20.98% / 79.02% [c]	92.72% / 7.28% [d]	56.93% / 43.07%
Grocery shop or greengrocers	34.15% / 65.85% [c]	45.63% / 54.37% [d]	39.90% / 60.10%
Online grocery shop	27.32% / 72.68% [c]	10.68% / 89.32% [d]	18.98% / 81.02%

Table 14 Food and FW related lifestyle and habits (continue)

Lifestyle and Habits	United Kingdom	Thailand	Pooled
Food expenses per week			
£0 - £10 or 0 – 150 Baht	1.46%	2.43%	1.95%
£11 - £20 or 151 – 300 Baht	7.32%	8.25%	7.79%
£21 - £30 or 301 – 450 Baht	15.61%	8.74%	12.17%
£31 - £40 or 451 – 600 Baht	15.21%	18.93%	17.03%
£41-£50 or 601-750 Baht	18.05%	6.80%	12.41%
£51-£60 or 751-900 Baht	12.68%	9.22%	10.95%
£61-£70 or 901-1,050 Baht	12.68%	19.90%	16.30%
More than £70 or 1,050 Baht	15.12%	24.76%	19.95%
I do not know	1.95%	0.97%	1.46%
Chi-squared = 4.143 with 1 d.f.			
Probability = 0.0418			
Storing habits *			
"In general, I often keep food items in right conditions (e.g., in a fridge) so they will last."	5.918 [c] (1.307)	6.115 [c] (1.099)	6.017 (1.210)
"Food kept for a long time is not fresh and I do not want to eat it."	3.889 [c] (1.580)	4.555 [d] (1.480)	4.223 (1.565)
Planning habits *			
"I always plan what I am going to eat a couple of days in advance."	4.731 [c] (1.652)	4.411 [d] (1.536)	4.571 (1.601)
"What I am going to have for dinner is very often a last-minute decision."	3.966 [c] (1.743)	4.756 [d] (1.402)	4.362 (1.628)
Cooking habits			
Frequency of cooking/ preparing food			
Never	1.44%	0.96%	1.20%
Less than once a month	0.00%	4.31%	2.16%
1 to 3 times per month	2.88%	6.22%	4.56%
Once a week	0.96%	3.83%	2.40%
2 to 3 times per week	12.98%	30.14%	21.58%
4 to 5 times per week	40.38%	21.05%	30.70%
Every day	41.35%	33.49%	37.41%
Chi-squared = 17.698 with 1 d.f.			
Probability = 0.0001			
Average cooking duration (minutes)			
0 - 10	0.49%	0.97%	0.73%
11 - 20	2.93%	8.21%	5.58%
21 – 30	25.37%	22.71%	24.03%
31 – 40	27.80%	19.81%	23.79%
41 – 50	16.10%	10.63%	13.35%

Table 14 Food and FW related lifestyle and habits (continue)

Lifestyle and Habits	United Kingdom	Thailand	Pooled
51 – 60	14.15%	26.57%	20.39%
61 – 90	7.80%	7.73%	7.77%
91 – 120	3.90%	1.93%	2.91%
121 – 150	1.46%	0.48%	0.97%
More than 150	0.00%	0.97%	0.49%
Chi-squared = 0.055 with 1 d.f.			
Probability = 0.8139			
Equipment ownership : Yes / No			
Microwave	89.27% / 10.73% [c]	80.19% / 19.81% [d]	84.71% / 15.29%
Fridge	96.10% / 3.90% [c]	95.65% / 4.35% [c]	95.87% / 4.13%
Freezer	91.22% / 8.78% [c]	58.45% / 41.55% [d]	74.76% / 25.24%
Stove or hob	88.78% / 11.22% [c]	89.37% / 10.63% [c]	89.08% / 10.92%
Oven	95.12% / 4.88% [c]	46.38% / 53.62% [d]	70.63% / 29.37%
"I re-use leftovers to make new meals." *	5.400 (1.266) [c]	5.754 (1.034) [d]	5.578 (1.168)
Eating habits			
Most frequent meal partners			
Alone	25.96%	10.05%	17.99%
Friends	7.21%	0.96%	4.08%
Family members	27.40%	69.86%	48.68%
Colleagues	1.44%	2.87%	2.16%
Partner	37.98%	16.27%	27.10%
Pearson chi2(4) = 82.3993			
Pr = 0.000			
"Certain members of the family have different tastes in food from the rest of the family."*	5.063 (1.507) [c]	4.656 (1.700) [d]	4.859 (1.618)
"Certain members of the family are choosy about what they eat."*	4.851 (1.598) [c]	4.900 (1.619) [c]	4.875 (1.606)
"When eating dinner, the most important thing is that everyone (e.g., family or friends) is together."*	5.264 (1.422) [c]	6.062 (1.205) [d]	5.664 (1.375)
"I eat before I get hungry, which means that I am never hungry at meal times."*	3.591 (1.680) [c]	3.440 (1.528) [c.]	3.516 (1.605)
"I eat whenever I feel the slightest bit hungry."*	4.005 (1.583) [c]	4.349 (1.424) [d]	4.177 (1.513)
"At home, snacking is more common than set meal times."*	3.673 (1.783) [c]	3.608 (1.587) [c]	3.640 (1.686)

Table 14 Food and FW related lifestyle and habits (continue)

Lifestyle and Habits	United Kingdom	Thailand	Pooled
"At home, I often serve myself too much food, more than I can finish."*	3.938 (1.748) [c]	3.191 (1.824) [d]	3.564 (1.823)
Eating out habits			
Frequency			
Never	5.77%	0.96%	3.36%
Less than once a month	42.31%	19.62%	30.94%
1 to 3 times per month	27.40%	22.97%	25.18%
Once a week	12.02%	18.66%	15.35%
2 to 3 times per week	5.77%	26.32%	16.07%
4 to 5 times per week	5.77%	8.13%	6.95%
Every day	0.96%	3.35%	2.16%
Chi-squared =50.890 with 1 d.f.			
Probability = 0.0001			
Frequent places for eating out :			
Yes / No			
Fast food restaurants	47.96% / 52.04% [c]	57.97% / 42.03% [d]	53.10% / 46.90%
Street food shops	14.80% / 85.20% [c]	66.18% / 33.82% [d]	41.19% / 58.80%
Canteen or Cafeteria	8.16% / 91.84% [c]	48.79% / 51.21% [d]	29.03% / 70.97%
Casual dining place	72.45% / 27.55% [c]	77.78% / 22.22% [c]	75.19% / 24.81%
Formal dining place	27.04% / 72.96% [c]	26.09% / 73.91% [c]	26.55% / 73.45%
Café	33.67% / 66.33% [c]	31.40% / 68.60% [c]	32.51% / 67.49%
"Going out for dinner is a regular part of my eating habits."*	4.097 (1.762) [c]	3.324 (1.557) [d]	3.700 (1.702)
"I enjoy going to restaurants with family and friends."*	5.684 (1.249) [c]	5.217 (1.413) [d]	5.444 (1.354)
"When eating out, I often order too much food for myself, more than I can finish."*	3.653 (1.789) [c]	3.010 (1.567) [d]	3.323 (1.708)
The frequency of taking leftovers home**	2.582 (1.715) [c]	3.749 (1.826) [d]	3.181 (1.865)

[*] The results are mean (SD) based on seven-point Likert Scale of agreement from 1 to 7 (1 = strongly disagree to 7 = strongly agree) for each statement.

[**] The results are mean (SD) based on seven-point Likert Scale of frequency from 1 to 7 (1 = never, 2 = rarely, 3 = occasionally, 4 = sometimes, 5 = frequency, 6 = usually, 7 = every time)

[c,d] Same letters between UK and Thailand results indicate no statistically significant difference whereas different letters indicate statistically significant difference at a 95% level of confidence.

4.4.4 CFW behaviour and food-wasting habits

Table 15 presents habits of consumers in relation to wasting food by national groups and as a combined data group. The beliefs regarding their habits are significantly different except the feeling of reluctance when throwing food away. Overall, there are gaps between consumer's beliefs about their own behaviour and their perception about other people's behaviour. The frequency scale shows that people believe other people in their society create FW more often than themselves.

Table 15 Food wasting habits of the UK, Thailand groups and pooled data

Habits	United Kingdom (n = 208)	Thailand (n = 209)	POOLED (n = 417)
The frequency of creating plate waste**			
Others behaviour	3.221 (1.404) [e]	3.904 (1.513) [f]	3.564 (1.497)
Own behaviour	2.452 (1.203) [e]	2.196 (1.012) [f]	2.324 (1.117)
"I hate it when I need to throw food in the bin."*	5.837 (1.213) [e]	5.876 (1.080) [e]	5.856 (1.147)
"As long as there are still hungry people in this world, food should not be thrown away."*	5.567 (1.473) [e]	6.239 (0.961) [f]	5.904 (1.286)
"I would rather have a second helping than leave food on my plate."*	5.067 (1.479) [e]	5.766 (1.159) [f]	5.417 (1.372)
"In general, for the food with "Best Before" date, it is better to throw it away if the date has passed than risk eating it."*	3.534 (1.906) [e]	5.445 (1.464) [f]	4.492 (1.948)

[*] The results are mean (SD) based on seven-point Likert Scale of agreement from 1 to 7 (1 = strongly disagree to 7 = strongly agree) for each statement.

[**] The results are mean (SD) based on seven-point Likert Scale of frequency from 1 to 7 (1 = never, 2 = rarely, 3 = occasionally, 4 = sometimes, 5 = frequency, 6 = usually, 7 = every time)

[e,f] The same letters between UK and Thailand results indicate no statistically significant difference whereas different letters indicate statistically significant difference at a 95% level of.

For the respondents' own behaviour, they reported that they rarely created FW. Both groups of consumers agreed that they hated to put leftover food in the bin. However, Thai respondents had a significantly stronger agreement that food should not be thrown away if there are still hungry people in the world. The results also show that Thai and UK consumers would rather take more food (i.e., second serving) if that would help reduce FW, but Thai people agreed more with this statement. Perhaps the most

striking result is the perception about the “best before date” which is clearly different between Thai and British consumers. Thai people were significantly more risk averse than the UK respondents. The former group would prefer to waste food that had passed its label date.

4.4.5 Summary statistics of the vignette experiment

Table 16 Mean ranking of each scenario for the UK

Scenario numbers	Mean ranking (S.D.)	Commensality	Place of dining	Meal cost	Amount of leftovers	Future meal plan
20	2.679 (1.919)	with others	home	£30 (500 Baht)	whole	no
28	3.216 (2.335)	alone	home	£30 (500 Baht)	whole	no
10	3.278 (1.947)	alone	home	£30 (500 Baht)	half	no
16	3.444 (2.062)	alone	home	£30 (500 Baht)	whole	yes
27	3.588 (1.846)	with others	home	£6 (100 Baht)	whole	no
2	3.600 (2.222)	with others	home	£30 (500 Baht)	half	no
8	3.660 (1.944)	with others	home	£30 (500 Baht)	whole	yes
22	3.925 (2.235)	with others	home	£30 (500 Baht)	half	yes
4	3.960 (2.347)	alone	restaurant	£30 (500 Baht)	whole	no
30	4.000 (2.498)	alone	home	£30 (500 Baht)	half	yes
12	4.019 (2.327)	with others	restaurant	£30 (500 Baht)	whole	no
1	4.220 (2.393)	alone	home	£6 (100 Baht)	half	no
19	4.283 (2.460)	alone	home	£6 (100 Baht)	whole	no
26	4.333 (2.066)	with others	restaurant	£30 (500 Baht)	half	no

Table 16 Mean ranking of each scenario for the UK (continue)

Scenario numbers	Mean ranking (S.D.)	Commensality	Place of dining	Meal cost	Amount of leftovers	Future meal plan
18	4.377 (2.021)	alone	restaurant	£30 (500 Baht)	half	no
32	4.392 (2.011)	with others	restaurant	£30 (500 Baht)	whole	yes
21	4.491 (2.207)	alone	home	£6 (100 Baht)	half	yes
15	4.593 (2.088)	with others	home	£6 (100 Baht)	whole	yes
24	4.755 (2.156)	alone	restaurant	£30 (500 Baht)	whole	yes
7	4.800 (2.330)	alone	home	£6 (100 Baht)	whole	yes
14	4.815 (2.216)	with others	restaurant	£30 (500 Baht)	half	yes
6	4.900 (1.972)	alone	restaurant	£30 (500 Baht)	half	yes
9	5.019 (2.219)	with others	home	£6 (100 Baht)	half	no
29	5.059 (2.167)	with others	home	£6 (100 Baht)	half	yes
11	5.130 (2.224)	alone	restaurant	£6 (100 Baht)	whole	no
25	5.392 (2.219)	alone	restaurant	£6 (100 Baht)	half	no
3	5.400 (1.969)	with others	restaurant	£6 (100 Baht)	whole	no
5	5.460 (2.401)	with others	restaurant	£6 (100 Baht)	half	yes
23	5.623 (1.973)	with others	restaurant	£6 (100 Baht)	whole	yes
13	5.704 (2.246)	alone	restaurant	£6 (100 Baht)	half	yes
17	5.868 (1.881)	with others	restaurant	£6 (100 Baht)	half	no
31	6.020 (1.871)	alone	restaurant	£6 (100 Baht)	whole	yes

Table 16 and Table 17 present an overview of a mean ranking score of each scenario ranging from the most likely saved dinner (i.e., lower mean ranking score) to the situation when the food would most likely be discarded (i.e., higher mean ranking score) for British (Table 16) and Thai (Table 17) respondents respectively.

Overall, for the UK group, the average scores of saving-wasting food fall in both sides of the scale between one to eight. There are 17 dining situations receiving the mean ranking lower than the midpoint, and 15 scenarios achieve the scores toward a more wasteful choice. What stands out in the table for UK people as an overall trend is that they chose to keep food that they consume at home at a higher price and when they have no plan for the future meal. The food that would most likely be thrown away tends to be the food served at a restaurant having a lower cost. The situation which received the most likelihood of saving score (2.679±1.919) is when there are other people in the dining situation, the meal is taking place at home, the meal costs £30, the leftovers are enough for a whole lunch tomorrow, and when they have no future meal plan. The highest average ranking score (6.020±1.871), or the dinner situation when UK people mostly chose to discard leftovers, is from the situation when they were having dinner alone, in a restaurant, for £6, the leftover was enough for a full meal for tomorrow's lunch, and there was a future meal plan.

Table 17 below shows the results of vignette rankings from Thai respondents. Unlike the British group, the mean ranking of saving-wasting food among Thai respondents is more likely to be higher than the central point of the scale (i.e., higher probability to discard food). The mean ranking scores of 18 scenarios show the likelihood of dinners being wasted whereas the other 14 situations have more possibility that the dinners would be saved for later meals. Looking at a pattern in the table, Thai respondents are more likely to save a larger portion of leftovers which cost them more. Other interesting data in this table is Thai respondents are likely to save food if they had dinner alone. The highest likelihood of food being kept for the next lunch, mean ranking 3.098±1.982, is from the situation when there are other people at home and the food costs 500 Baht, the leftover dinner is enough for a whole lunch tomorrow, even though there has been a lunch plan. On the other hand, Thai respondents are most likely to ignore a half-portioned leftover dinner they were having with others, at a restaurant, that cost them only 100 Baht, and they have tomorrow food plan already, with the average mean ranking of 6.020±2.015.

Table 17 Mean ranking of each scenario for Thailand

Scenario numbers	Mean ranking (S.D.)	Commensality	Place of dining	Meal cost	Amount of leftovers	Future meal plan
8	3.098 (1.982)	with others	home	500 Baht (£30)	whole	yes
28	3.273 (2.329)	alone	home	500 Baht (£30)	whole	no
16	3.500 (2.183)	alone	home	500 Baht (£30)	whole	yes
20	3.667 (2.330)	with others	home	500 Baht (£30)	whole	no
24	3.686 (2.005)	alone	restaurant	500 Baht (£30)	whole	yes
10	3.712 (2.163)	alone	home	500 Baht (£30)	half	no
4	3.725 (2.384)	alone	restaurant	500 Baht (£30)	whole	no
30	4.164 (2.537)	alone	home	500 Baht (£30)	half	yes
18	4.196 (2.117)	alone	restaurant	500 Baht (£30)	half	no
19	4.196 (2.341)	alone	home	100 Baht (£6)	whole	no
27	4.200 (2.337)	with others	home	100 Baht (£6)	whole	no
6	4.216 (2.444)	alone	restaurant	500 Baht (£30)	half	yes
22	4.294 (2.129)	with others	home	500 Baht (£30)	half	yes
2	4.373 (1.928)	with others	home	500 Baht (£30)	half	no
32	4.509 (2.098)	with others	restaurant	500 Baht (£30)	whole	yes
21	4.510 (2.194)	alone	home	100 Baht (£6)	half	yes
11	4.558 (1.994)	alone	restaurant	100 Baht (£6)	whole	no
29	4.564 (2.551)	with others	home	100 Baht (£6)	half	yes

Table 17 Mean ranking of each scenario for Thailand (continue)

Scenario numbers	Mean ranking (S.D.)	Commensality	Place of dining	Meal cost	Amount of leftovers	Future meal plan
7	4.627 (2.200)	alone	home	100 Baht (£6)	whole	yes
12	4.673 (2.415)	with others	restaurant	500 Baht (£30)	whole	no
14	4.750 (2.308)	with others	restaurant	500 Baht (£30)	half	yes
9	4.846 (2.296)	with others	home	100 Baht (£6)	half	no
1	4.922 (2.226)	alone	home	100 Baht (£6)	half	no
26	4.964 (2.000)	with others	restaurant	500 Baht (£30)	half	no
31	4.964 (1.866)	Alone	restaurant	100 Baht (£6)	whole	yes
13	4.981 (2.397)	alone	restaurant	100 Baht (£6)	half	yes
15	4.981 (2.210)	with others	home	100 Baht (£6)	whole	yes
3	5.020 (2.035)	with others	restaurant	100 Baht (£6)	whole	no
25	5.364 (2.031)	alone	restaurant	100 Baht (£6)	half	no
23	5.706 (2.166)	with others	restaurant	100 Baht (£6)	whole	yes
17	5.745 (2.171)	with others	restaurant	100 Baht (£6)	half	no
5	6.020 (2.015)	with others	restaurant	100 Baht (£6)	half	yes

4.4.6 Estimation results from the ROL model

The parameter estimates for each country and for a combined group showing both main and interaction effects from the rank-ordered logistic regression model (ROL) are shown in Table 18. In each model (i.e., UK, Thailand, and pooled), the parameter estimates, and standard errors (std. err.) are presented in the left column and the right column shows significant levels. Overall, all three models have p-value < 0.01.

Table 18 Parameter estimates for ROL model with vignette variables' main effects and interactions for the UK, Thailand, and the pooled sample.[27]

Effects	United Kingdom (n = 208)		Thailand (n = 209)		Pooled (n = 417)	
	Parameter Estimates (std. err.)	p-value	Parameter Estimates (std. err.)	p-value	Parameter Estimates (std. err.)	p-value
Presence	-0.120	0.349	-0.068	0.594	-0.107	0.237
(alone, with others)	(0.128)		(0.128)		(0.090)	
Place	-0.461	**0.000**	-0.125	0.328	-0.283	**0.002**
(home, restaurant)	(0.130)		(0.128)		(0.091)	
Cost	0.518	**0.000**	0.368	**0.004**	0.441	**0.000**
(low, high)	(0.130)		(0.129)		(0.091)	
Amount	0.142	0.271	0.210	0.095	0.170	0.059
(half, whole)	(0.129)		(0.126)		(0.090)	
Plan	-0.198	0.124	-0.118	0.345	-0.159	0.076
(no, yes)	(0.129)		(0.125)		(0.089)	
Presence x Place	-0.004	0.976	-0.287	**0.018**	-0.137	0.106
	(0.119)		(0.121)		(0.085)	
Presence x Cost	0.034	0.777	0.025	0.828	0.029	0.727
	(.121)		(0.115)		(0.083)	
Presence x Amount	0.256	**0.023**	-0.013	0.906	0.124	0.119
	(0.113)		(0.112)		(0.079)	
Presence x Plan	0.023	0.840	0.015	0.889	0.032	0.688
	(0.113)		(0.111)		(0.079)	
Place x Cost	0.033	0.769	-0.002	0.983	0.011	0.889
	(0.114)		(0.114)		(0.080)	
Place x Amount	-0.154	0.177	0.000	1.000	-0.076	0.340
	(0.114)		(0.113)		(0.080)	
Place x Plan	0.091	0.421	-0.013	0.908	0.025	0.751
	(0.113)		(0.112)		(0.080)	
Cost x Amount	0.047	0.676	0.050	0.655	0.047	0.553
	(0.113)		(0.111)		(0.079)	
Cost x Plan	-0.074	0.511	0.127	0.259	0.029	0.714
	(0.113)		(0.112)		(0.079)	
Amount x Plan	-0.084	0.489	-0.005	0.968	-0.040	0.629
	(0.121)		(0.115)		(0.083)	

* low cost = £6 for the UK or 300 Baht for Thai group and high cost = £30 or 500 Baht.

[27] Positive estimates indicate saving leftover food and negative estimates indicate leaving leftover food. p-values for significant factors at 95% level of confidence are in bold.

Therefore, the null hypothesis, that there is no effect of the independent variables on the dependent variable, is rejected. The models are statistically significant.

4.4.6.1 Main effects

Overall, from the pooled dataset, respondents preferred to save leftover dinners when they were having food at home and when the food cost more money. Between these two factors, food cost plays more important role than the place of dining. Commensality, amount of leftover food, and future meal plan were not significant at the 5% level. This pattern of effects from the pooled dataset is similar to the UK dataset. However, the magnitude of the factor of dinner place was nearly as important as the magnitude of the food cost factor for British respondents. The difference between the UK and Thailand groups is the significance of the place. While the dining location strongly influenced British people's decisions about whether or not to keep the remaining food, this factor had no statistical effect on Thai consumers. For the Thai group, it was only the price of the dinner that had a significant impact on their decision at the 95% level of confidence. When the cost of food was high, it was likely that the leftovers would be kept for a later meal. At the 90% level of confidence, the data also show that the amount of leftover food was statistically significant for Thai respondents (p-value < 0.10). They were likely to save the remaining dinner if the amount was enough to make a whole meal.

4.4.6.2 Interaction effects

Figure 11 and Figure 12 present statistically significant interaction effects between the commensality and leftovers amount factors for the UK and between presence and place factors for the Thailand, respectively. The *y*-axis in both graphs is based on the likelihood scale of saving leftovers, in which the higher number the more likely the respondents are to save the food. The interaction graphs show that the most desirable circumstance for food to be kept for later consumption in the UK was when the food was sufficient for a full lunch tomorrow and there were other people present during the meal. In a similar dining situation, but with 50% less food, the remaining dinner is significantly less likely to be saved. When having dinner alone, the UK respondents' decision to save food did not vary much according to the different sizes of the leftovers, but at full-sized lunch of leftovers was much preferred to the lesser amount.

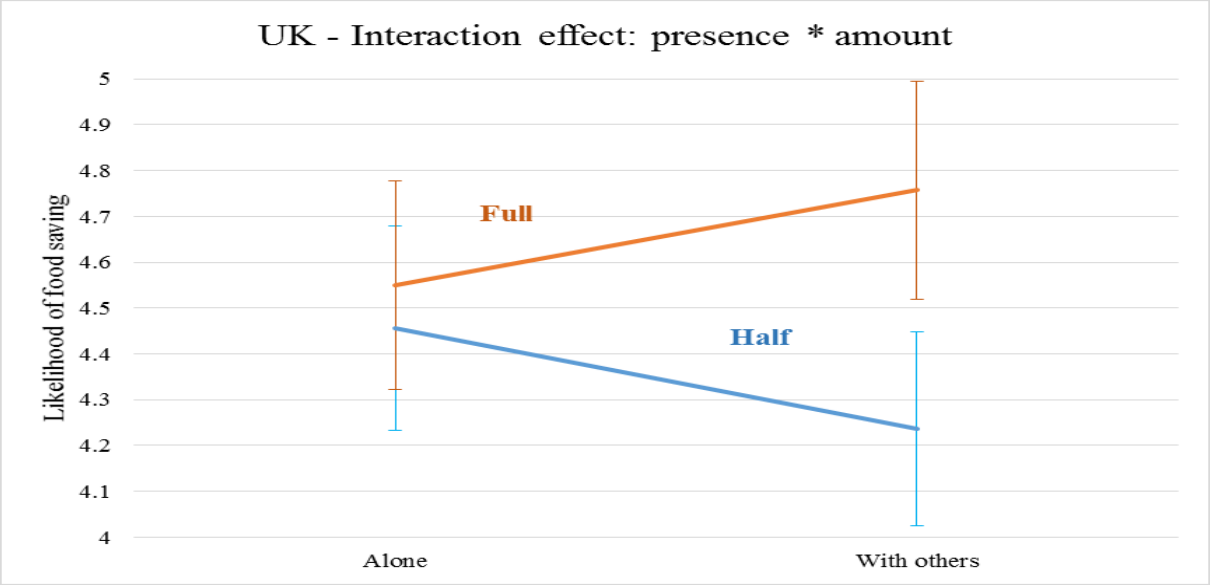


Figure 11 Statistically significant interaction effect between presence of others and amount of leftovers for the UK

For Thailand, the situation in which Thai consumers would be most likely to store leftover food for later was when they were having dinner alone at home. In contrast, when the dinner situation had taken place in a restaurant and the respondents were with other people, the leftovers were strongly rejected by consumers. If the dining situation takes place outside of a home setting (i.e., in a restaurant), it is clearly shown in Figure 12 below that Thai people choose to take away the leftovers if they eat alone.

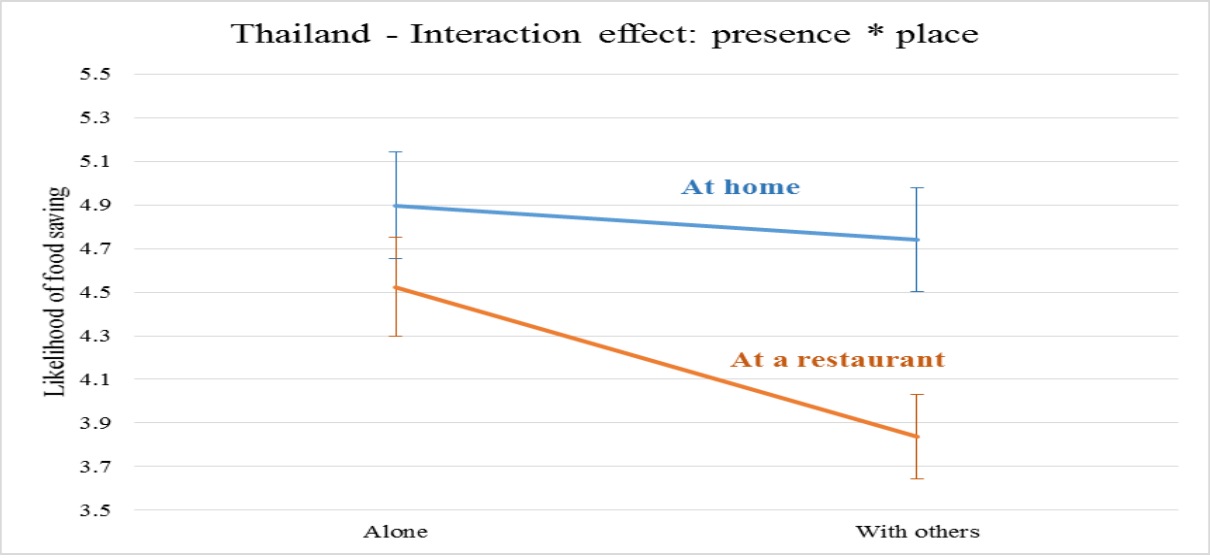


Figure 12 Statistically significant interaction effect between commensality and place of dining for Thailand.

4.4.7 Estimation results from the ROML model

Table 19 shows the parameter estimates for the UK and Thailand of the main effects using the ROML model. The results present the mean, standard error of the mean (SEM) and the standard deviation (S.D.) of the marginal utilities across respondents which indicate effect existence (Makowski et al., 2019). The “t-value” is simply the mean divided by the associated SEM. Strictly speaking this is a pseudo t-value because t-values and associated p-values are not calculated using Bayesian inference (Kruschke, 2013; Stern, 2016). Nonetheless, a t-value above 2 indicates that there is a very small mass in the posterior to the left of zero for the mean utility. Conversely, a t-value below -2 indicates that there is only a small mass in the right tail of the posterior for the mean marginal utility. Broadly speaking, this mirrors what is done in classical analysis.

The results show that in both countries there is a higher probability that respondents will save the leftover meal when they are eating at home, the meal cost is more expensive, and the leftovers are enough for a full lunch tomorrow. When considering particularly the magnitudes, place of dining and meal cost are the two attributes that affect the likelihood of saving/wasting food the most. In addition, while there is a higher probability that UK respondents will save the leftover meal when they have no plan for tomorrow’s meals, there is a higher probability that the Thai respondents will save the leftover meal when they eat alone.

Table 19 Parameters estimates for ROML model with VE's variables main effects for the UK and Thailand

Attributes	United Kingdom (n = 208)				Thailand (n = 209)			
	Mean	SEM	S.D.	t-value	Mean	SEM	S.D.	t-value
Presence (alone, with others)	-0.01	0.07	0.16	-0.20	-0.31	0.09	0.49	-3.50
Place (home, restaurant)	-0.78	0.13	1.15	-6.01	-0.46	0.09	0.57	-4.95
Cost (low, high)	0.81	0.11	0.85	7.34	0.75	0.14	1.41	5.43
Amount (half, whole)	0.23	0.07	0.06	3.58	0.33	0.08	0.27	4.29
Plan (no, yes)	-0.31	0.07	0.20	-4.37	-0.09	0.08	0.32	-1.14

4.5 Discussion

We conducted quantitative analysis and our findings reveal differences of CFW behaviour between consumers in the UK and Thailand. We found that consumers in both countries were influenced by different meal factors when making decisions about wasting or saving food in a meal setting. This will be discussed in this section.

4.5.1 Factors affecting the consumer food waste decisions

In this part of the study, we investigated and compared CFW decisions related to leftovers from a fully prepared meal by conducting an online survey in the UK and Thailand. We found some interesting results.

From the mean ranking results, participants in the UK were less likely to save food when the dining was taken place at home and there is no future meal plan. On the other hand, Thai people would likely save leftover food when the dining situations are about having expensive food at home and the leftovers are enough for a later meal. Ellison and Lusk (2018) explained that consumers at home would likely trade-off between opportunity cost (i.e., time needed to spend cooking a new meal if the leftover food in the current meal is not saved.) and the cost of the food itself. Therefore, when there is no meal planned in the future, consumers would not want to cook again if there is a potential that the food left in the present time would save their future cooking or preparing time.

First, we found that on average consumers are likely to save food when eating at home. This finding is corroborated by Ellison and Lusk (2018) which found that US consumers are more likely to save food when it is produced at home rather than at the restaurant. Although the scenarios in our VE did not indicate how food is cooked when dining at home (i.e., food can be brought from out of home), a possible explanation for this might be that consumers value homemade meals more. Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer (2015) explained that people who cook are better at visualising how food can become a meal and therefore tend to value the food more than those who do not cook, thus resulting in less FW. Greek consumers in Ponis et al. (2017) support this idea and concluded that people who cook food at home by themselves tend to be those who waste less than people who like to eat out in a restaurant.

There are particularly remarkable results about the significant impact of the dining place when we compared the UK and Thailand. Results from the food and FW related lifestyle and habits in Table 14 show that it is quite rare for British people to take leftovers home while Thai consumers occasionally do so. From the mean ranking results in Table 16, econometric analysis by ROL in Table 18, and ROML (Table 19), British respondents did not show their willingness to take the leftovers home when eating out. Particularly from the ROL model, place is not a significant factor for Thai group. The food service sector in the UK is another area where there is a great deal of FW. However, the results do not entirely reflect that the leftover food is wasted. In the US, Sakaguchi et al. (2018) found that restaurants routinely give leftovers that are clean and edible to their staff to eat. Therefore, it may be possible that FW would be saved eventually. Qualitative research into the rationale behind this behaviour might be able to enrich these findings.

It is anticipated that consumers are likely to save food when the cost of the meal is high. In accordance with this present result, previous studies have demonstrated that the cost of food has an impact on CFW behaviour or decisions to waste food such as in Ellison and Lusk (2018) and Hamilton and Richards (2019). In other literature, the effect of food cost on the amount of FW behaviour has been widely studied in the context of food products or in the retail sector (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015; Joerissen et al., 2015; de Hooge et al., 2017; Rohm et al., 2017; Clark and Manning, 2018). In a slightly different FW situation but in the context of food cost, British respondents in Clark and Manning (2018) explained that when foods, particularly fruits and vegetables, are cheap, they are thrown away without compunction because consumers prefer to buy newer and fresher food items.

Perhaps the most striking finding is the strong effect of food cost on CFW decisions among Thai respondents than UK respondents. However, Thai dataset are presented by a higher income group than the UK dataset. Therefore, we would have expected to see no or less impact of food cost on Thai respondents' CFW decisions because of the strong positive relationship between income and FW behaviour which has been previously reported in the literature (Parfitt et al., 2010; Stefan et al., 2013; Tokareva and Eglite, 2014; Neff et al., 2015; Joerissen et al., 2015; Ellison and Lusk, 2016). On the macro level, Parfitt et al. (2010) found that rich consumers are able to afford food just to be wasted because food cost contributes to a small proportion of their income. In other words, when consumers have more purchasing power, food price may not affect their CFW decisions. Some possible explanations can also be found in

Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer (2015) and Clark and Manning (2018) who emphasised that being aware of how food is produced and also knowing the monetary value attached to FW can help to reduce FW. This might explain why food cost is strongly significant for people from a food producing country like Thailand where agriculture is one of the main economic activities (Ariyapruchya et al., 2017; World Bank, 2019). Therefore, it can be implied from our findings that the relationship between CFW behaviour and financial factors (e.g. income and costs) is not straightforward. There are more in-depth details to examine. Future research about FW comparing between countries or focusing on developing countries could investigate not only about people's income or monetary factors but also about, for example, the level of people's engagement in food production, food knowledge and life experience.

Commensality as a standalone factor does not have significant impact on the likelihood of saving the meals. However, it becomes important when the factor interacts with the amount of leftover meal for the UK and with the place of dining for Thailand as shown in the results from ROL model. Previous studies showed that social norms might come into play when other people are involved in a situation (Cialdini and Goldstein, 2004; Graham-Rowe et al., 2014; Lorenz, Hartmann and Langen, 2017; Hamerman et al., 2018). In Thailand, the situation that shows the least likelihood of consumers saving leftover food is when they dine in a restaurant with others. For people in the UK, when eating with others and the leftovers portion is large, the likelihood of food being saved for later is higher than when eating alone. Köster (2009) pointed out that social surroundings are another main driver of consumer food choice. According to Hamerman et al. (2018), it will also depend on who those meal mates are and how the restaurant staff takes part in the situation. If they eat out with someone with whom consumers are not familiar, the likelihood of taking the food home might be low and would increase when restaurant staff encourage them to do so (Wang et al., 2017; Mirosa, Liu, et al., 2018). Asking to take away leftovers might trigger the feeling of embarrassment and fear of a social norms violation (Hamerman et al., 2018) because people might think that people who ask for the leftovers food might be poor (Wang et al., 2017).

Last, because our VE project focused on the initial stage of saving leftover food to prevent FW in a meal setting, we may not be able to confirm that the saved food will not end up being wasted later. This was not part of our study, but it might be possible. Findings from previous studies show that there are people who would not want to

consume food that is not fresh or which has been leftover (Joerissen et al., 2015; Principato et al., 2015). Our findings yield a slightly different outcome. In this regard, consumers from the UK and Thailand are significantly different. On average, the British respondents in our study somewhat disagreed with the statement “food kept for a long time is not fresh and I do not want to eat it.” while respondents from Thailand would agree with this statement. However, overall, consumers somewhat agreed that they would re-use leftovers to make new meals (see Table 14). Therefore, there are other possible areas to be investigated in the future such as reusing leftover food for future meals.

4.5.2 Norms and culture

Previous studies have indicated that normative attitudes play an important roles in CFW behaviour (Wansink and van Ittersum, 2013; Qi and Roe, 2016; Stancu et al., 2016). In our survey, we also found that people tend to feel guilty about wasting food and were aware that other people would expect them to not do so (see Table 13). Some research studies have shown the effectiveness of norm messages to manipulate or change behaviour of people in a society toward a better option (Wansink, 2004; Lally et al., 2011; Mollen et al., 2013; Wansink and van Ittersum, 2013; Di Noia and Cullen, 2015). From the results, we can see that the magnitudes of moral norms, injunctive norms, and personal normative attitudes among Thai consumers are significantly stronger than among British people.

Both the UK and Thailand groups did not show distinct personalities on the IND-COL scale. This is not as expected (i.e. Thailand is expected to be more collectivist while the UK has more individualist culture). Hamamura (2011) found that our societies are becoming more individualist because of modernisation. For example, Japan and China were believed to have a culture of collectivism but have become more individualist (Matsumoto et al., 1996; Hamamura, 2011; Zhang and Weng, 2019). Zhang and Weng (2019) also found that the culture of individualism has increased and coexisted more with the collectivist culture in contemporary China. Our Thai participants are represented more by people from urban areas and have higher income than the UK group. Therefore, it is possible that modern lifestyle in the capital city of Thailand would be more like individualist culture. Since the score for horizontal collectivist for Thai people is the highest among other cultural scales, influencing Thai consumers by emphasising the equality between the benefits for each individual and group benefits from FW reduction would potentially help to push the FW reduction policy forward in

Thailand. However, it is possible that Thai citizens would want to see a similar approach to be equally implemented across the population. For the UK, policy makers could point out that each citizen can contribute to society by wasting less food and this could be done using normative messages. Additionally, British consumers show a high level of vertical collectivism. This means they accept hierarchy in their community as well as prioritising group benefits (Singelis et al., 1995). Therefore, they might not mind if they saw different measures applied among different groups of people because they are more aware that people are different. This is a typical characteristic of vertical collectivism.

4.6 Conclusions

To sum up, the likelihood of food being saved or wasted depends on several contextual factors. CFW decisions are similar between consumers in the UK and Thailand but with different levels of factor significance. We understand more about which dining factors play an important role in CFW situations in different countries. Thus, for policy makers, in order to effectively reduce CFW, it is important to understand CFW decision processes and the effect of contextual factors in different countries. However, we will need further explanations to understand the rationale behind certain CFW decisions such as why British people had a low level of likelihood to save food when eating out and for Thai people, they are likely to leave any leftover food when eating with others in a restaurant. Obtaining qualitative data would help gain more insights into the reasons of these outcomes which will be presented in the next chapter.

Chapter 5
Focus Group Discussion

5.1 Introduction

In the previous study, we found empirical evidence based on quantitative analysis. We have learned that some factors are significant or less significant for CFW decisions from the VE. We obtained numerical data (e.g. from a seven-point Likert scale of agreement) from the questionnaire survey about CFW behaviour. However, these mathematical results have not yet provided enrich details about CFW behaviour that could be discovered more when we discuss with consumers in person. In this consecutive study, we performed qualitative analysis to gain an in-depth understanding of consumers' comprehensive experience, expectations, and opinions about CFW behaviour in meal settings (objective 3 of this thesis). In particular, this study aims to complement findings obtained from the quantitative analysis in the previous chapter. This study, therefore, sets out to ascertain why the commensality, meal cost, place of dining, amount of leftover meal, and future meal plan influence or do not influence people when making FW decisions. In other words, the main question this study was trying to find is "why" and "how" some factors are important for CFW behaviour and some are not according to the previous study. Particularly, while FAO or WRAP have encouraged people to plan their meals in advance to reduce CFW at home (FAO, 2015a; WRAP, 2017b), meal planning is not a significant factor for CFW decision to save leftover food from the previous VE results using the ROL model but the results from ROLM show that the effect of this factor exists. We, therefore, would like to reveal more and probe into the effects of this factor as well as other factors. Moreover, this project seeks to compare British and Thai consumers following the objective 2 of this thesis.

5.2 Methodology

The qualitative research method was implemented using focus group discussion (FGD) as an approach to obtain in-depth information about CFW behaviour. Chadwick et al. (2008) defined a focus group as "a group discussion on a particular topic organised for research purposes" (p. 293). The discussion "involves a number of people – often with common experiences or characteristics – who are interviewed as a participative group by a researcher (often assisted by a moderator or a facilitator) for

the purpose of eliciting ideas, points of agreement or controversy, thoughts, perceptions about a specific topic or certain issues linked to an area of interest" (Holloway and Galvin, 2016, p. 125). Therefore, the FGD is a group interview, moderated and facilitated by researchers, to investigate people's opinions.

We implemented the FGD method to help to explain quantitative findings and provide more in-depth knowledge about CFW. Previous studies in the context of FW (e.g., Ofei et al. (2014), Burton et al. (2016), and Benyam et al. (2018)) also used FGD in order to understand CFW behaviour, perception, and attitudes. Mirosa, Liu, et al. (2018) also conducted a qualitative study using FGD after a survey to investigate what prevents consumers from taking leftover food home from a restaurant or a café.

The study protocol and semi-structured questions were submitted to the School of Agriculture, Policy, and Development Ethical Committee in April 2019 before the discussion. The group discussions were conducted in May 2019 for the UK and another two groups in July 2019 for Thailand. The following sections will explain about our FGD participants and relevant procedures for this study. For full details of the FGD protocol, please see in Appendix 11.

5.2.1 Participants

To ensure the diversity of participants in each discussion group, as well as to maintain the same dynamic as the previous quantitative study, the same quotas were planned. We aimed for an equal proportion of genders and age groups for each FGD. The criteria were that the participants must have Thai or British citizenship for Thailand and the UK group, respectively. The recommended number of consumers for each FGD was between 6-12 (Stewart et al., 2007). There were two focus groups for each country. From Table 20, participant demographic quotas were fulfilled, except UK's group 1 and Thailand's group 2. Female participants outnumbered in the former group, whereas the latter did not include more senior male participants. This is due to participants' unavailability to join the discussions on certain dates and times during the recruitment process. M1, M2, F1, F2, G1 and G2 codes in Table 20 will be used to indicate demographic characteristics of participants when their statements are referred to later.

Table 20 Participant numbers for each discussion group in Thailand and the United Kingdom (UK)

Demographic characteristics		Demographic groups	UK (n=17)		Thailand (n=16)	
			Group 1 (G1)	Group 2 (G2)	Group 1 (G1)	Group 2 (G2)
Male	18-46 years old	M1	4	2	1	1
	47-75 years old	M2	0	1	2	1
Female	18-46 years old	F1	3	2	2	5
	47-75 years old	F2	2	3	2	2

Participants were recruited using posters and advertising through social media and e-mails. For the UK Group, the “participants needed” flyers were placed both within and outside the University of Reading campuses to ensure people from the public were also recruited. The same approach was implemented in Thailand. The posters were put around Kasetsart University, Bangkaen campus, as well as outside the university area. Public places included bus stops, supermarket announcement boards, corner shops, food shops, restaurants, and car parks.

People who were interested in joining the discussion or required further information contacted the researcher via e-mail. Alternatively, for Thailand, LINE application[28] was also a contact method. After receiving an email or a message in LINE, a participant information sheet was sent to prospective participants via Qualtrics online platform, followed by screening questions if they wanted to proceed. The participant information sheet provided details about the study and the group discussion process. This document was also given to the participants on the activity days. The screening questions asked for information about participants’ age[29], gender, citizenship, and the current country of residence.

5.2.2 Incentives

Each participant received a 15% discount voucher in return from a restaurant at the end of the discussion. In the UK, we received this support from Bolan Thai restaurant,

[28] LINE is a smartphone chat application which is more convenient for Thai people to contact the researcher because the researcher was not based in Thailand when the recruitment process started. E-mail is not a common mean of communication among Thai people and would reduce the ease of recruitment. Participants can contact the researchers without knowing researcher personal mobile number.

[29] Age was collected in a range: 18-46 and 47-75 years old.

Reading. Loving Hut restaurant, Bangkok, provided these vouchers for the Thai groups.

5.2.3 Focus group discussion settings

According to Malhotra et al. (2017), the discussion setting should be “relaxed and informal” (p. 185). Considering participants’ characteristics, requirements, and convenience, a medium-sized room within the University of Reading was used for the UK groups. A similar room was used at Kasetsart University for the Thai groups. Tables were arranged in a mini boardroom style. The moderator, note taker, and assistant were nearby. The sketch of the discussion setting is shown in Figure 13. The dashed line suggests that the moderator is mobile, according to the situation during the interview. Light refreshments were provided at the beginning and throughout the sessions.

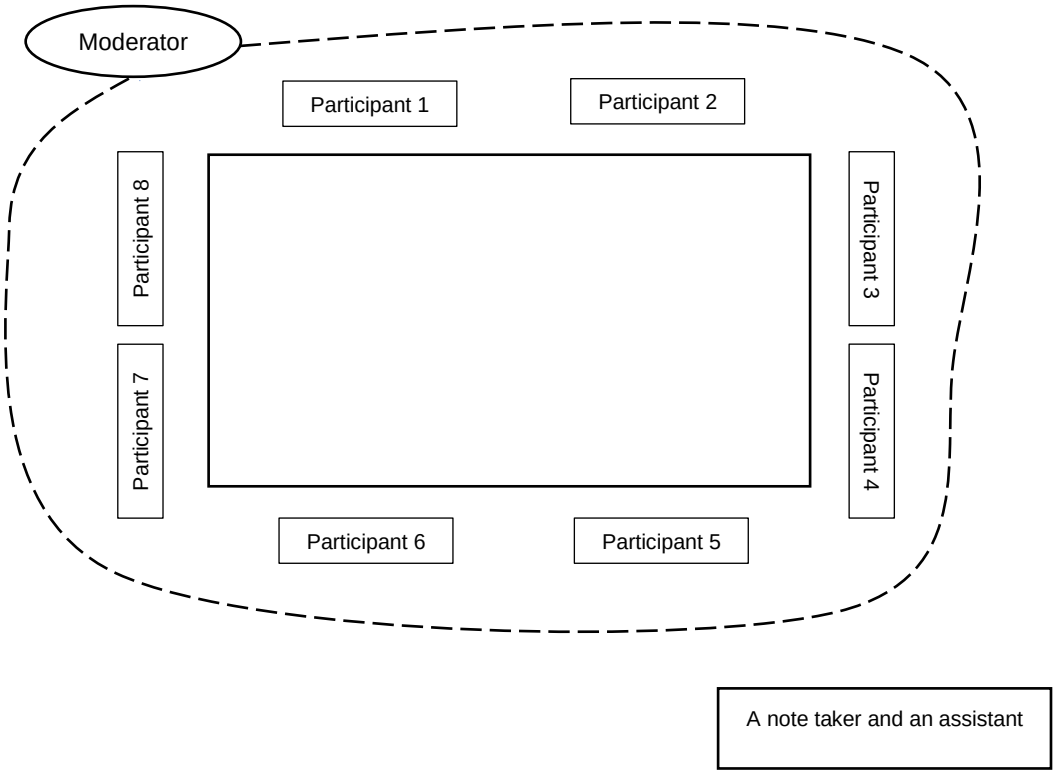


Figure 13 Sketch of the boardroom table arrangement for the FGD sessions

There were three researchers in the discussion, having different roles: 1) moderating, 2) assisting and 3) note-taking. All three ensured the discussion was conducted in a friendly manner. Moreover, they were also capturing intonation and non-verbal information (e.g., tone, mood, and gestures). While participants were sitting in a circle

facing each other, the moderator moved around the room to let participants discuss among themselves, to encourage other participants to join the conversation, and to reduce the chance of giving “ideal” answers to the moderator.

5.2.4 Focus group discussion procedure

Each discussion followed the eight steps depicted in Figure 14. Each step had its own objectives and will be presented in the following paragraphs. Throughout the discussion, except for the Registration and the Closing steps, planned questions had been prepared before the discussion sessions took place (Berg and Lune, 2016). However, it was the moderator’s role to probe and add other questions when appropriate, such as if the conversation moved toward certain topics (Berg and Lune, 2016). Malhotra et al. (2017) argued that FGD should be unstructured. However, this approach was strongly discouraged, as there were objectives of the study to meet. Setting a dozen questions or less beforehand would set a firm yet flexible boundary of the conversation topic. Therefore, we followed Berg and Lune (2016)’s suggestion regarding the semi-structured nature of the protocol.

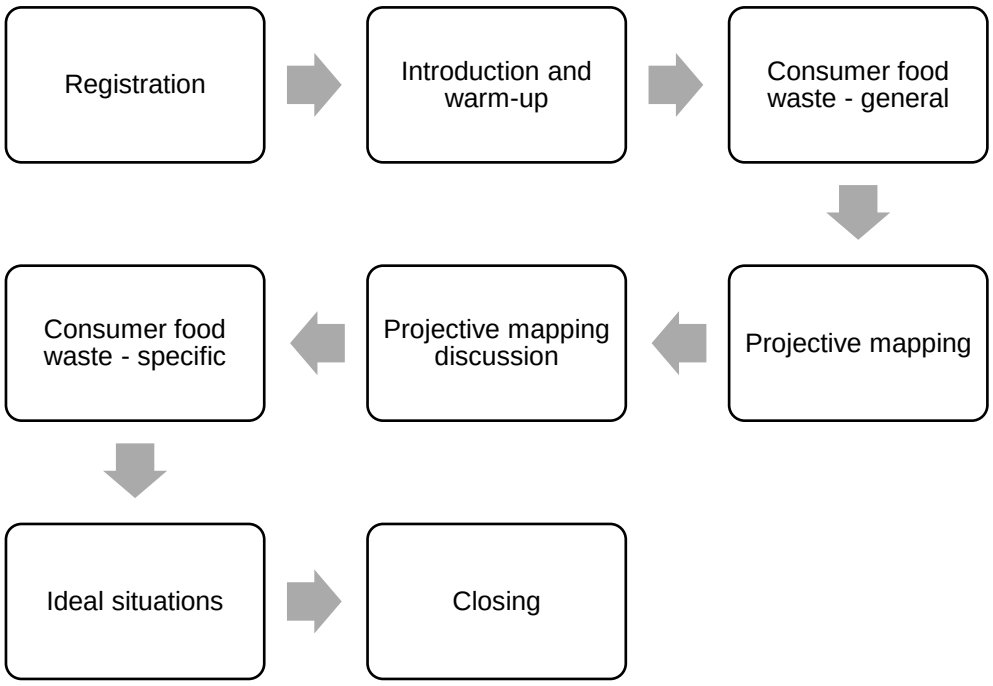


Figure 14 Focus group discussion protocol

Registration was a short period before the actual FGD when researchers and participants settled down to make the participants feel welcome and relax before the discussion. The discussion began with an introduction to the activity and a warm-up

question. This stage aimed to let everyone introduce themselves. Moreover, researchers had a chance to explain the steps ahead and inform about the research. After that, participants were asked an easy question to break the ice: *"when you hear the words 'food waste', what comes first to your mind?"*. The main aim was to "activate" participants' train of thought in the context of FW before moving to the next step of FW behaviour. To move forward into the specific area of CFW in a meal setting, the step of "Consumer food waste – the general perception" aimed to examine consumers' in-depth experience without limiting them to any specific factors. In this particular section, the moderator narrowed it down to the situation where everyone is having a meal, and there is a possibility of food either being finished or left uneaten. After that, the participants were asked to perform an individual activity.

The next step was a task for each participant to do on their own. We used a projective mapping (PM) method as an initial step to lead participants towards specific meal situations for the project (Almli et al., 2015). We asked each person to reflect their thoughts and preference about CFW decisions using eight hypothetical dining scenarios (Almli et al., 2015) and create a perceptual map (Risvik et al., 1994). Originally from the area of psychology as a quantitative technique, PM has been implemented in the area of qualitative market research and alternative descriptive analysis of products, particularly food items, using pictures of food (Risvik et al., 1994; Pagès, 2005; Hopfer and Heymann, 2013; Dehlholm, 2014). Assessors project their holistic opinions onto a blank sheet of paper (Dehlholm, 2014). The participants are asked to; 1) group products together for which they think there are similar attributes or qualities and 2) place the figures on the provided space, usually a blank sheet of paper, close to each other as a group if they see similarities, and away from each other if they think the products are different (Hopfer and Heymann, 2013).

The projection will show a variety of grouping criteria used by the judges, e.g., shape, colour, or overall appearance. Qualitative value is an add-on step when facilitators ask assessors to describe samples with some keywords (Dehlholm, 2014). In the traditional way of PM, the paper space represents a graph area and researchers measure *x*- and *y*- coordinates where assessors position groups of figures to obtain numerical data for further analysis (Hopfer and Heymann, 2013). We adapted and partially implemented the technique at the early stage of our FGDs by aiming to let participants start thinking about plate waste decisions and to obtain qualitative data. Overall, the mapping had two main tasks and was carried out according to the process shown in Figure 15.

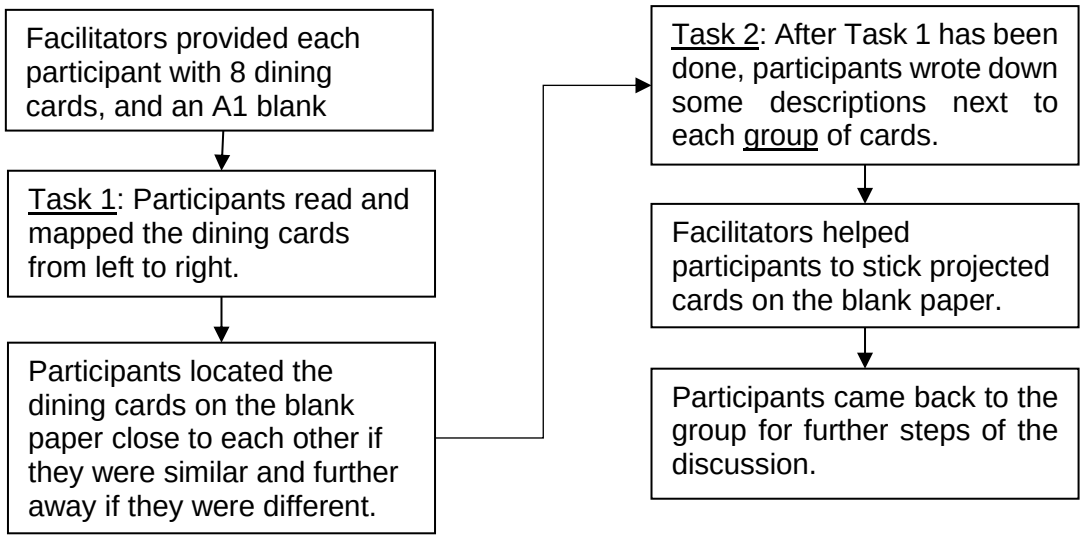


Figure 15 Projective mapping procedures

Participants were individually asked to evaluate eight cards of eight different dining situations. Examples of cards with wording adapted from Ellison and Lusk (2018) are shown in Figure 16.

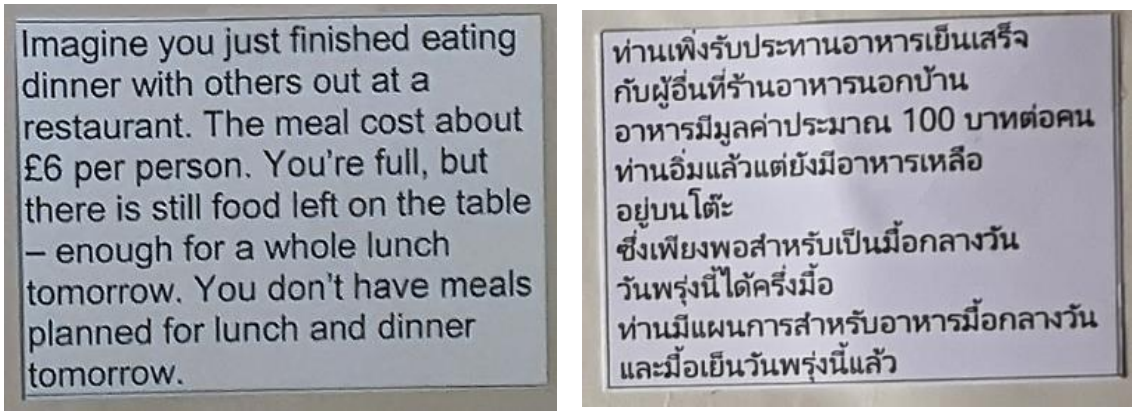


Figure 16 Examples of PM cards in English and Thai

The eight scenarios were from "block 1" in the previous quantitative vignette study. Every participant received the same eight cards so that the results between people could be compared. Moreover, the vignettes in a block have already been systematically randomised – each level of each factor is equally paired (i.e., equal number of times that each level of attributes was put together).

The vignettes demonstrated the variation of the five factors combinations; 1) commensality, 2) place of dining, 3) meal price per person, 4) amount of leftover food

in comparison with tomorrow's lunch, and 5) existence of a future meal plan. Those eight scenario details can be found in Table 21.

Table 21 Vignette independent attributes and levels used in the PM activity

Scenarios	Presence	Place	price	Amount	Plan
1	alone	home	100 ฿ (£6)	half	no plan
2	alone	home	100 ฿ (£6)	whole	with plan
3	with others	home	500 ฿ (£30)	whole	with plan
4	alone	restaurant	500 ฿ (£30)	whole	no plan
5	alone	restaurant	500 ฿ (£30)	half	with plan
6	with others	home	500 ฿ (£30)	half	no plan
7	with others	restaurant	100 ฿ (£6)	half	with plan
8	with others	restaurant	100 ฿ (£6)	whole	no plan

Eight 9 x 7 cm cards were given to a participant randomly with a blank A2 sheet of paper (Almli et al., 2015). It was emphasised to participants that there was no right or wrong answer for the way the cards were grouped and how they projected their answer on the map. With the variations of the five attributes, the projective mapping would show which factors people prioritised and their perspectives towards the dining situation based on the FW context.

After the individual mapping activity, the group discussion was resumed. We asked each participant to share their work as well as explain their opinion (i.e., the rationale behind the card arrangement and keywords). After the discussion of this PM task, the maps were collected, and the moderator started to investigate CFW behaviour and opinions in detail.

The next step was to probe into each attribute and its impact on the participant's decision or their FW behaviour in a meal setting. In-depth thoughts about the five main FW factors were obtained in this step. This step also allowed us to see how the factors interact with each other to influence CFW experiences. Participants were asked to discuss more in-depth aspects in the following step that we asked them for other possible FW factors from their experience. We let them explain both the situations when they would save the leftover food for later meals or have no FW and when there would be a wasteful situation. They were guided to give examples of these ideal

situations, both using the factors we have been discussing and other factors that the participants perceived as significant.

In the last five minutes, we provided an opportunity to add any details or thoughts they would like to mention but had not done previously. We specifically targeted those who had been slightly quieter than the rest of the group, encouraging them to speak up. There was no limit regarding the topic of the conversation as long as it related to CFW. After that, participants were thanked and provided with a restaurant discount voucher[30].

5.3 Materials

Data collection consisted of five main materials. First, notes were taken during the FGDs. Second, expanded notes were collated by the research team right after the focus groups or a post-discussion debriefing. The note-takers and moderators met and discussed the preliminary information collected (i.e., notes, observed emotion, and PM maps) to agree on the findings. The meeting was carried out because the information was still fresh to recall (Malhotra et al., 2017). Third, a summary report was written within 24 hours after each focus group to capture the obtained data both from memory, notes and the debriefing. Fourth, discussion audios and video-recordings were transcribed in the following days. Transcribed verbatim was stored and used in the analysis. Finally, projected ideas and keywords from the PM task were also collected.

5.4 Data analysis

The method of analysing the FGD data in this study uses the qualitative content analysis approach and follows the steps of Malhotra et al. (2017). As shown in

Figure 17, the analysis processes include data assembly, reduction of the data, display, and verification, respectively. As for the PM task, there is a more specific analytical process which will be discussed in section 5.4.5.

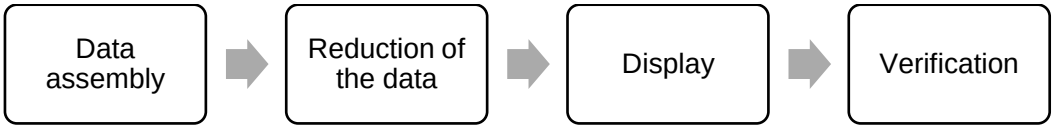


Figure 17 Qualitative data analysis process based on Malhotra et al. (2017)

[30] 15% off voucher from Bolan Thai restaurant in Reading for the UK groups and 15% off voucher from Loving Hut restaurant for the Thai groups.

The analysis of the qualitative data took place at every stage of the data collection to find a meaningful outcome from the FGD (Malhotra et al., 2017). For example, during the FGD, researchers observed how participants interacted with each other or noticed the tone of voice. The observation is also part of the data analysis process. Spiggle (1994) argued that FGD researchers need to use both analysis and interpretation processes to connect all sources of data. Those two main steps belong to the "inferential processes" in Spiggle (1994) and are similar to the analysis technique broken down in Malhotra et al. (2017). QSR International's NVivo 12 software was used to assist in data analysis.

5.4.1 Data assembly

Not only were the records from audio and video files analysed, but every source of information for the focus group was also collated for the purpose of analysis (Malhotra et al., 2017). Therefore, data sources included researchers' notes from each session, debriefing material, summary report, audio recordings, video recordings, and PM maps. Malhotra et al. (2017) stated that those separate notes, records, and reports improve the reliability of the data because a researcher could be biased if he or she only relied on memory.

Transcription and notes, including non-verbal information, taken by the researchers "provide a complete record of the discussion that unfolded during the focus group interview" (Berg and Lune, 2016, p. 99). Initially, the discussions were transcribed in the original language. Body language and gestures were also included in the transcriptions. After that, for the Thailand data, all materials in Thai were translated into English for further steps of analysis by the researcher.

5.4.2 Data reduction

After transcribing, some data were eliminated, particularly those that were not relevant, such as when participants were talking about situations not related to mealtimes when being probed about CFW behaviour in a meal situation. Coding has been used since the 1960s for this purpose and to organise the qualitative data (Glaser and Strauss, 1968). Spiggle (1994) defined this process as "categori[s]ation" units of data (i.e., passage of text from the interview). Malhotra et al. (2017) explained that the coding is "the process of bringing together participants' responses and other data resources into categories that form similar ideas, concepts, themes, or steps, in-process" (p. 244).

Spiggle (1994) pointed out that one code can be given to a) a few word long sentence or b) a long paragraph. On the other hand, the passage could be categorised as more than one theme (Spiggle, 1994). Therefore, coding is one way of reducing and organising data in a meaningful way to see patterns from the FGDs.

5.4.2.1 Coding

Coding was conducted by putting information from the discussion into themes. The coding was guided by the objectives of the study and in line with the question flow outlined in the FGD protocol (Braun and Clarke, 2006). Relevant ideas were mentioned at various points throughout the discussion. Therefore, the whole conversation was investigated to answer those objectives, not only at particular session within the FGDs.

Coding process was carried out by one main researcher of this thesis following Malhotra et al. (2017). There are six stages in this coding procedure. Firstly, broad groups of themes were coded based on the purposes of this study and the structure of the focus group interviews. Secondly, chunks paragraphs, or sentences were put highlighted to assigned to the codes. Thirdly, descriptions of the codes were reviewed, and some new code categories could be emerged during this step. Then, we examine different types of participants such as genders or occupations in order to compare between groups of participants. After that, relationships between these code categories were examined. If there were new insights, the coding procedures were repeated, and new codes were defined. Lastly, the codes and their meaning were continually refined until the patterns in the codes were valid.

5.4.2.2 Cross-country analysis

Answers and themes were compared between countries (Asioli et al., 2014). The comparison shed light on four main aspects: 1) similarity and difference; 2) absence and presence of issues; 3) individual or group; and 4) characteristics of consumer groups (Miles et al., 2013). Common themes and differences in answers between countries were examined. Topics which were heavily mentioned among one group (Thailand or the UK) but not at all in the other were highlighted. The length of the discussion to see the significance of each topic was also considered.

5.4.3 Display

Data display presents how the data are connected and interpreted by the researcher's point of view. Miles et al. (2013) described two major types of qualitative data display formats: "Matrices" and "Networks". A matrix is "a tabular format that collects and arranges data for easy viewing in one place, permits detailed analysis, and sets the stage for [other comparable data] (Miles et al., 2013, p. 111). Networks are illustrated with nodes and lines which link the nodes to represent the interrelationship between attributes (Miles et al., 2013). Spiggle (1994) mentioned that investigators could analyse qualitative data better particularly by displaying data. Tables and diagrams will be used to present the information gained from the FGDs.

5.4.4 Verification

The purpose of verifying the data is to include an explanation from other sources or theories. This process will ensure that researchers are presenting a valid view (Malhotra et al., 2017). In other words, this step provides readers with "faith in conclusions, inferences, and results" (Spiggle, 1994, p. 491). Moreover, multiple researcher triangulation and data triangulation processed were used to verify meanings of results. Notes and views from researchers involved during the FGDs were compared after each group discussion session. The notes were also verified together with video records for participants' gestures, emotion as well as results from PM maps.

5.4.5 Projective Mapping

The previous paragraphs are general steps for the qualitative data. In this particular section, a specific method used for the PM task was presented. There are four main steps in analysing observations from this session (Hopfer and Heymann, 2013; Vidal et al., 2013). First, the number of groups of meal scenarios each participant had on their maps was counted. This gave us broad ideas about how they tackled this task in a general picture and how it was different between people from the two countries. Second, factors or criteria consumers used in mapping were uncovered by considering their descriptions on the map, (dis)similarity between and within groups, notes from the discussion days, and transcriptions. Third, the number of times each dining scenario was paired or placed in the same group was counted. Last, based on the previous step, word associations from descriptive data on the maps that participants wrote to describe each group of dining cards were evaluated.

5.5 Results

Qualitative results from this FGD project are presented in this section. The structure of the result presentation is in line with the structure of the discussion session. First, consumers' general perception of the terms "food waste" or "consumer food waste" is addressed. Second, the following results are about consumer's opinion in the specific context of FW in a meal setting. Third, observations and data from the PM individual task are presented. Fourth, opinions about each factor of interest (commensality, place of dining, price, amount of leftover food, and future meal plan) are presented separately. Last, the results show other factors affecting CFW decisions, and ideal situations for having (no) FW.

5.5.1 General perception

A variety of topics was discussed by participants when being asked about FW in general. We could see that consumers from the UK and Thailand focused on both similar and different aspects. Overall, six broad themes emerged from the first topic, as shown in Figure 18 and examples of statements are presented in Table 22 (UK) and Table 23 (Thailand). Dash lines in Figure 18 show that there are links between the themes. In general, participants thought about 1) Stages in the food supply chain where the waste occurs; 2) Age and Time; 3) Behaviour of people; 4) Norms; 5) Emotion or conversation that has a feeling attached to it; and 6) Food attributes.

Perhaps the most striking feedback is about the types of food and where FW takes place. Five stages within the food chain were mentioned. As shown in Figure 19, the *x*-axis shows five areas of FW, and the number of times participants referred to these areas is shown in the *y*-axis. First, in the "Production" category, conversations involved food commodities on farms or in participants' gardens. Second, the thoughts about "Retail" relate to the commercial level and how supermarkets or shops sell food products, such as *"fruit that has reached its sell-by date"* or when a participant was being *"seduced by buy-one-get-one-free"*, that leads to creating more or less FW.

Third, the food service business, e.g., restaurant, canteen or café, is another distinctive topic in the discussion which participants considered, and these are grouped under the category named "Restaurant". Fourth, the category called "Plate waste" includes leftovers from meals in general, regardless of the eating location, described as *"leftover food"* or *"meals that you don't end up eating"*. Last, the term "food waste" also reminded many participants about the FW from "cooking or ingredients at home". The most

discussed theme for Thailand was about plate waste. Among the UK groups, FW at the retail level was the most popular topic, but it was the least mentioned by Thai participants. The aspect about *"ugly"*, *"wonky"*, or *"rejected"* food on farms, (e.g., *"wonky food that is a little bit less perfect, it's just left raw or chucked away."*) was rarely mentioned by all four groups, particularly by British participants who mentioned least about this aspect.

After starting a conversation about the place where FW occurs, participants were likely to mention reasons based on food attributes. Opinions from Thai groups focused on intrinsic quality (e.g., *"there is food waste because it's not tasty."*) but ideas from the UK participants tended to be more about extrinsic aspects (e.g., *"they sell too large packaging size in the supermarket."* and *"some people just put it straight in the bin if it passes its best-before date."*). Additionally, older participants from both countries were more likely to talk about the younger generations. We found that participants pointed out how behaviour has changed over time and how parents influenced or have influenced them. For example, both British and Thai young professionals admitted that they were more careful about their money when they were students, but now they waste more because they have more disposable income. Particularly among British consumers, almost everyone said they were forced by their parents to finish their food when they were young.

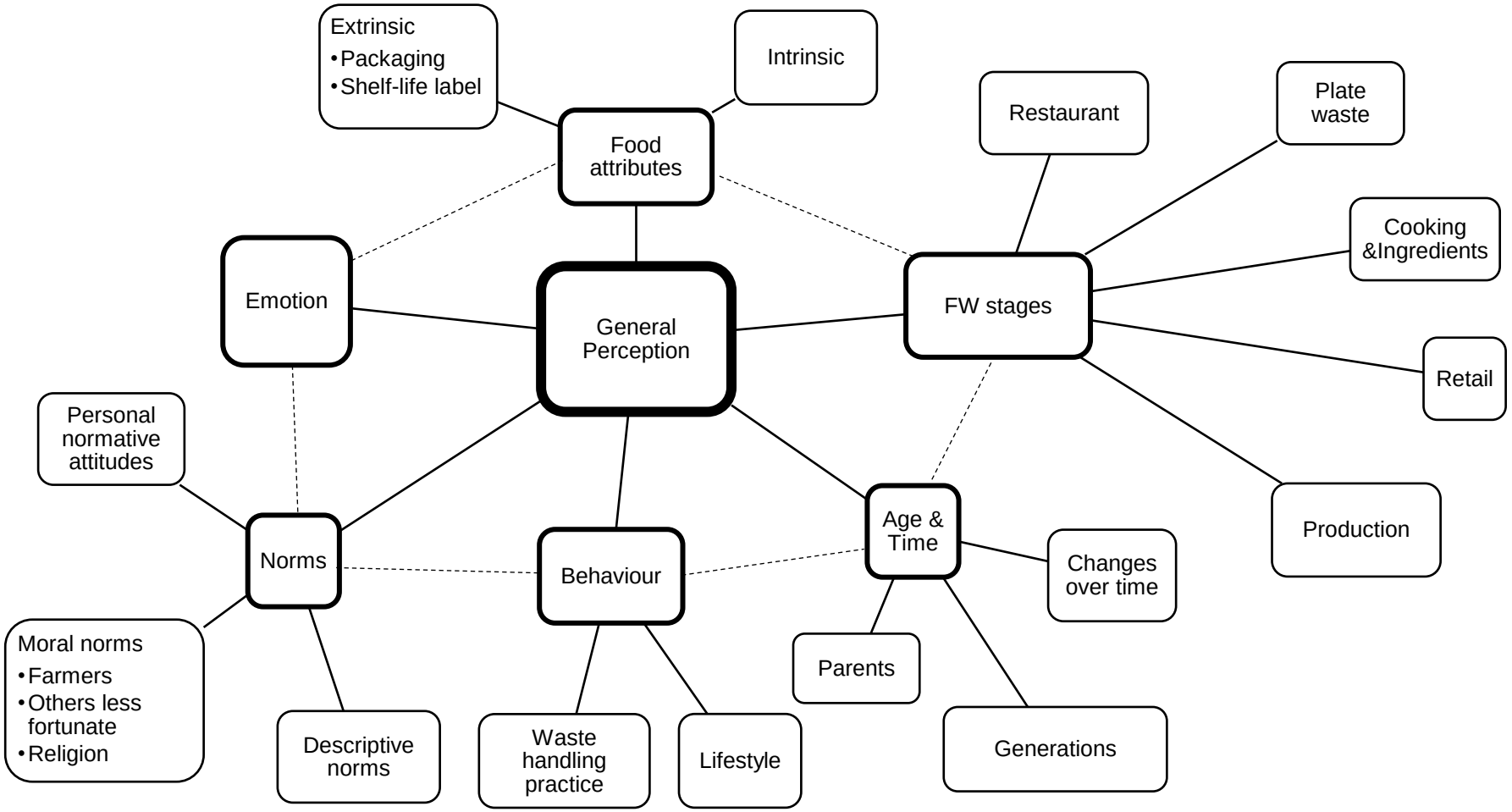


Figure 18 Themes from FW general perception

Figure 19 Focused areas of food waste discussed in the general perception session

Participants also talked about people's lifestyle and how they would deal with FW. For example, they would save leftover food after meals. While British people shared their habit of buying too many food products, Thai participants pointed out their tendency to over-order food when eating out. In terms of norms, there was some generalisation about social behaviour, e.g., pointing out how other people behave in general, and passing strong judgement on others' behaviour. We can also detect morally normative attitudes in the conversation, particularly among Thai participants (e.g., *"I don't waste food because I feel sorry for rice farmers."*).

Perhaps the most distinctive differences in this discussion between the two nations stem from the source of the attitudes (e.g., parents). Thai people showed a strong connection with religious beliefs and sympathy for farmers that affect their current CFW behaviour. On the other hand, British people identified their current behaviour based on their parent's rationing and austerity due to their post-war experience. Another prominent difference between old and young participants is the "Emotion" theme. The former usually sounded angrier and more serious compared with the latter when talking about FW. Some prominent statements are presented from the UK (Table 22) and Thailand (Table 23).

Table 22 Examples of distinctive statements of FW general perception from UK discussion groups

Distinctive statements from the UK groups	Themes
"Like my grandparents grew up in rationing times. They instilled into my parents a mindset like "can't waste any food. You got to use everything." Even it looks a bit dodgy after a few days in the fridge; "No! Still good. It's fine. Finish it." (Participant 11, G2, F1, UK)	Parents, Intrinsic food attributes,
"Imagine you go up the road, and you buy a pound of potatoes two pounds of potatoes what you need for that evening. And you get home. They'll be covered in dirt, and you're going to wash them. You probably find a couple of stems in there as well. People now don't find that acceptable…and it ends up wasted." (Participant 3, G1, F2, UK)	Retail, Emotion, Norms, Lifestyle
"Supermarket sometimes adds something due to expire, and they don't want to sell it. Some places they just can't sell it" (Participant 1, G1, M1, UK)	Retail, Extrinsic food attributes,
"For me, it's been an issue with food waste bins by Wokingham council, which I think is fantastic." (Participant 8, G2, M2, UK)	Waste handling practice, Emotion

Table 23 Example of distinctive statements of FW general perception from Thailand discussion groups

Distinctive statements from Thailand groups	Themes
"….I feel pity. that's a waste. In case I know someone waste food I will say 'oh why you have leftovers'. 'Such a bad habit! Why waste food!'. I think like this because I compare it with myself. For example, we have 3 generations at home. When I was young and could not finish the food, my dad would tell me to feel sorry for those who don't have enough to eat, sorry for rice farmers. 'Watch out for the karma', my grandma said. So I think at least I have no food waste and there won't be bad karma for me." (Participant 24, G1, F1, Thailand)	Emotion, Generations, parents, Norms (Religion and Farmers), Plate waste,
"We're limited by time because we drive to school and eat in a car. Sometimes my kids fall asleep in the car. And there is rice left. We bin it when we arrive at school. (Participant 21, G2, F1, Thailand)	Lifestyle, plate waste,

Table 23 Example of distinctive statements of FW general perception from Thailand discussion groups (continue)

Distinctive statements from Thailand groups	Themes
"When I was a kid, my granddad and grandmum taught me as you said. Like if we cannot eat it all, we should feel sorry for rice farmers. Alternatively, it is bad karma if we waste food. But I have to admit after I grow up, I don't think about this so much. I mostly think about what I like or what convenient for me would be." (Participant 19, G1, M1, Thailand)	Parents, Norms (Religion and Farmer), Change over time
"Do we notice we would be charged for leftovers if we dine in a buffet-style restaurant and they have rules for this? But if there's no rule for this, that's it, waste. This is also about rules in dining as well that would create or not create food waste." (Participant 25, G2, M2, Thailand)	Restaurant, Lifestyle, Norms,

5.5.2 Food waste in a meal setting

The responses emerging in the conversation about FW in a meal setting varied across the different groups. The most prominent topic was the practice of saving food which was left over from a meal. Figure 20 shows themes from this discussion session. The black shapes reflect general or shared themes, whereas the blue squares emphasise thoughts strongly represented by Thai participants. The British participants mostly described ideas shown in the orange boxes. Participants were thinking about food and how the food is served as shown on the left side of "consumers" in Figure 20. These factors connect with the consumer's internal factors on the right side of the diagram. There were quite clear themes about gender, preference, and values. Throughout the conversation, participants also tried to identify group identities or by saying *"this is Thai/ British culture"* or *"in our society"*.

Overall, people tended to justify if they waste food or not and what they do with the leftover food from a meal. When talking about eating out, British people have a specific term called a *"doggy bag"* which refers to a pack of leftover food to take home after a meal at a restaurant. Thai people call it a *"pack of leftovers"*. While giving leftover food that has been saved from a restaurant or other places to strangers was perceived as normal for Thai people, British participants gave a different perspective. For example, in the UK, some participants were asked to sign a disclaimer to abide by their decision to take the leftovers home and agree not to sue the restaurant if they became ill from

eating the leftover food. A couple of participants who experienced this were not impressed by this measure in their "culture"; as one put it: *"I was gobsmacked. I was like 'I'm sorry?!'"* (Participant 7, G2, F2, UK) and another one said, *"our society is so odd"* (Participant 11, G2, F1, UK). This does not happen in Thailand. As well as feeling able to take away the leftovers, some of the Thai participants also shared the food with random people they met on their way home (e.g., security guard in a car park, house cleaners, or people who are less fortunate or have lower socioeconomic status). Therefore, saving food from a restaurant in the UK could be more challenging than in Thailand.

Common factors affecting CFW behaviour were uncovered in this session. First, it was found that meal portion size is important and varies depending whether people serve themselves or not. Second, CFW decisions also depend on what type of food is served. Examples of statements from Thailand are as follows;

> *"I let my kids serve themselves. There won't be any food left [on their plates]."* (Participant 29, G2, F1, Thailand)
>
> *"People in my family serve themselves too much food to be able to finish."* (Participant 23, G2, F1, Thailand)
>
> *"It's uncontrollable how they serve in a restaurant in our culture. For example, rice with curry. Rice is served with toppings, and it comes with a certain portion. Sometimes it can be too much."* (Participant 24, G1, F2, Thailand)

Examples from the UK participants are shown below;

> *"I try not to waste, try to make the right portion meal but I felt when you're eating out, all the portions are too big I think, most people feel that."* (Participant 9, G1, M1, UK)
>
> *"Like I think about parts of meat that people say like undesirable like parts of the animal that people don't eat but then other cultures they eat them all the time."* (Participant 11, G2, F1, UK)
>
> *"It's also different when you prepare your own food. If I put more effort to prep curry, I'd be more reluctant to throw it away."* (Participant 32, G2, F1, UK)

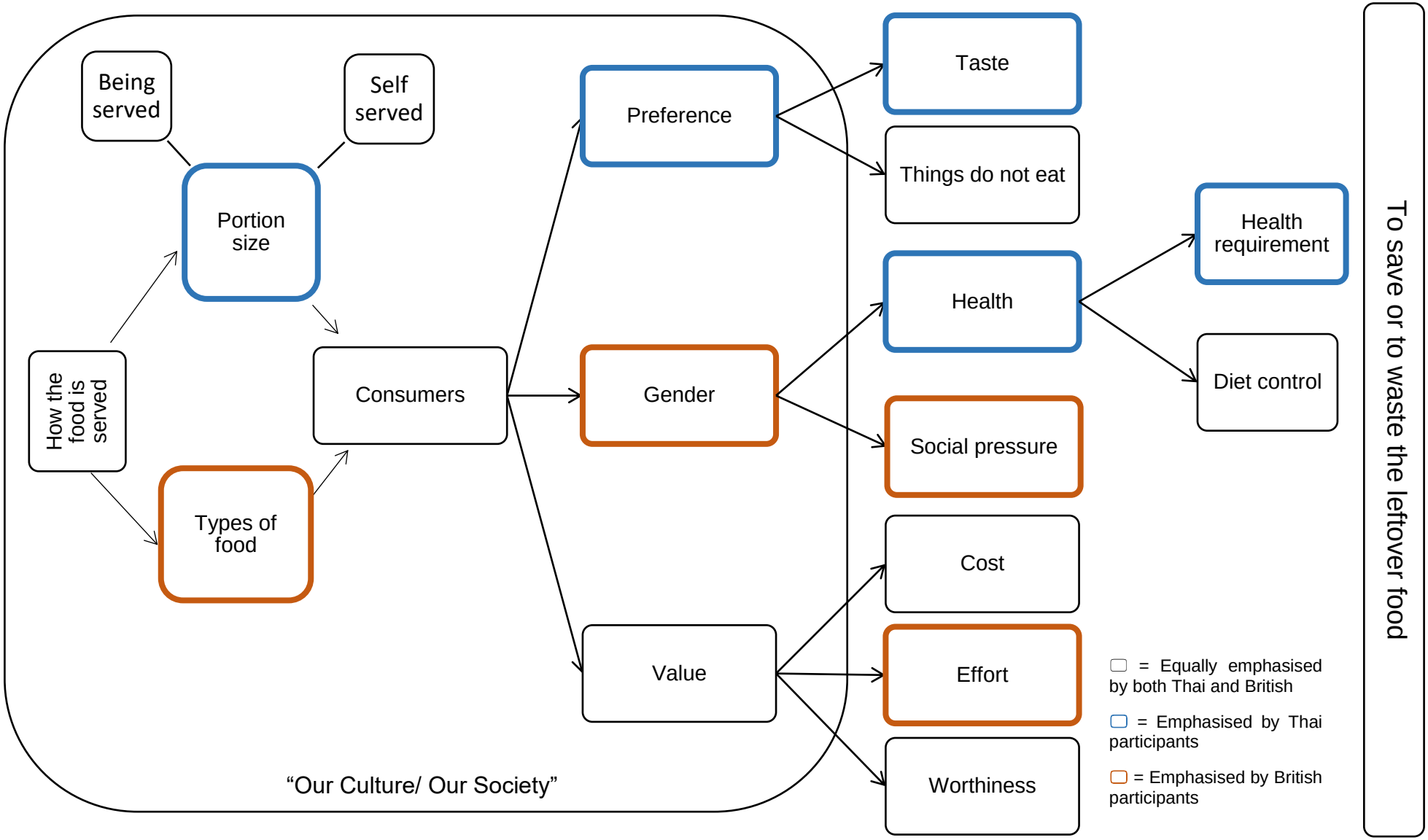


Figure 20 Main connected themes and thought processes in a question about FW in a meal setting

Particularly revealing is how the participants described their preferences in terms of food taste and specific food they do not consume. These views were echoed by some participants who similarly mentioned that *"I waste some food because it doesn't taste good"* or *"it's not tasty!"*.

A few interviewees referred to particular types of food. For example, one said, *"There might be something I don't like, or I don't eat, and it will be leftovers which I don't want from the beginning but, for example, the restaurant has already put it in the dish."* (Participant 17, G1, F1, Thailand). Furthermore, another older Thai participant showed evidence as she put *"My grandchildren will eat only what they like. When there's something they do not like, there will be something left."* (Participant 26, G2, F2, Thailand). Two British examples, each from different UK FGD groups, are *"…I don't really eat meat. It took so long for me to eat something like a piece of meat… I couldn't finish it."* (Participant 3, G1, F2, UK) and *"If someone offered me a bag of Wotsits*[31]*, I'm not sure if I see that as food waste the same way I would see an orange because I have no idea what Wotsits is. Because it's not food, [I can waste it]"* (Participant 32, G2, F1, UK).

Next, gender, health, and social perception are also connecting themes for CFW factor in a meal setting. Many Thai participants mentioned *"women and diet control or weight loss"* and *"women and diabetes"*. Therefore, food is left unfinished due to these factors. However, not every situation was from a female perspective. One male participant mentioned his intention to leave some food occasionally due to weight control. He said that *"It could be a small victory to see I don't finish all the food because I was trying to lose some weight."* (Participant 9, G1, M1, UK). Surprisingly, ideas among two British women also showed social expectation concerning gender. The first statement below is from the older participant, and the following one is from the younger.

> *"37 years ago, I went to my partner's house for the first time to meet his mother. He said by the time I left, she didn't like me – one of the reasons she didn't like me was because I ate everything on my plate and a lady should leave something."* (Participant 7, G2, F2, UK)

And:

[31] Wotsits is a snack brand in the UK. They are corn puffs with cheese flavour.

"Well if I can bring gender into this. I know my female friends who will deliberately always leave a bit of food on their plate because they don't want to be perceived as greedy or having eaten too much." (Participant 32, G2, F1, UK)

Last, cost, effort, and worthiness are grouped under the theme "value" which is another factor for consumer behaviour regarding FW. Table 24 provides examples of the consumer's narrative statements. Participants reported that they did not want to waste food because it has already cost them something despite the food being cheap or expensive. On the other hand, some people reckoned that food is wasted because it is cheap. Another idea, which was emphasised more by British participants, is about investment in the food. They did not want to easily throw it away if they had spent time preparing a meal ("effort"). Conversely, when food was easily acquired, or less effort was used, people could easily waste the food. Moreover, there might be an occasion, e.g., in a buffet, when consumers wanted a larger amount of food than usual for a fixed price they have paid ("worthiness"). Interestingly, the monetary penalty for leftover food was applied in some Thai buffet restaurants to prevent CFW but this was not mentioned by British participants. Evidence of these ideas are shown below;

Table 24 Examples of statements showing opinions about the value

Statements	Value		
	Cost	Effort	Worthiness
UK			
"I grew up during rationing. So, I don't leave stuff, but I think younger generation always do… particularly children because food is cheap, and I think food is possibly too planned for them and too cheap in our culture." (Participant 8, G2, M2, UK)	✓	✓	
"It's also different when you prepare your food. If I put more effort to prep curry, I'd be more reluctant to throw it away. Different from a ready-made salad. I can easier bin it." (Participant 32, G2, F1, UK)		✓	
"I think the most guilty experience is when I'm at buffets. When I was young there was the trick of, 'fill the plate' and then all of a sudden, I would break and couldn't move and just feel lethargic and sick. If there's a big plate, food gets thrown in the bin." (Participant 1, G1, M1, UK)			✓

Table 24 Examples of statements showing opinions about the value (continue)

Statements	Value		
	Cost	Effort	Worthiness
Thailand			
"I try to finish all the food, either cooked food or the food I buy. If I have leftovers, I would feel annoyed. I would feel like it's not worth my money spent on it. If I cook for myself, I will try to eat it all because I spent time cooking it." (Participant 19, G1, M1, Thailand)		✓	✓
"I'm a grown-up and I know the value of the money spent on it. There won't be any wasted because I believe in the value of it." (Participant 12, G1, M2, Thailand)	✓		
"For a buffet, I am afraid of the penalty because sometimes I take a lot of food and cannot finish it. But we paid for it already. We might as well fill up the plate." (Participant 20, G2, F1, Thailand)			✓
"It's also about food prices and availability/accessibility of food. Like in our culture our country, like my family, when we go out, we half eat, half waste it. It's true. Like when we order food, we order more than we actually need. Our food isn't too expensive. It is affordable." (Participant 15, G2, M1, Thailand)	✓		

5.5.3 Projective mappings

From the PM task, Thai and British people had some similarities and differences in their thought processes and PM maps. Some participants showed complicated works, whereas some arranged more straightforward maps. Participants arranged cards into groups and there were between two (i.e., four cards were put together and split into two groups of cards) and eight groups (i.e., each card was individually placed) on their maps. Figure 21 presents a different number of groups of people from the two countries presented in their maps.

Thai participants mapped the cards into two to five groups. More than half of them presented around two to three groups on their maps by putting three to four cards together. British consumers had two to eight groups on their map. Interestingly, there

were two British consumers who perceived all dining scenarios as unique individual situations and individually placed the cards on the maps.

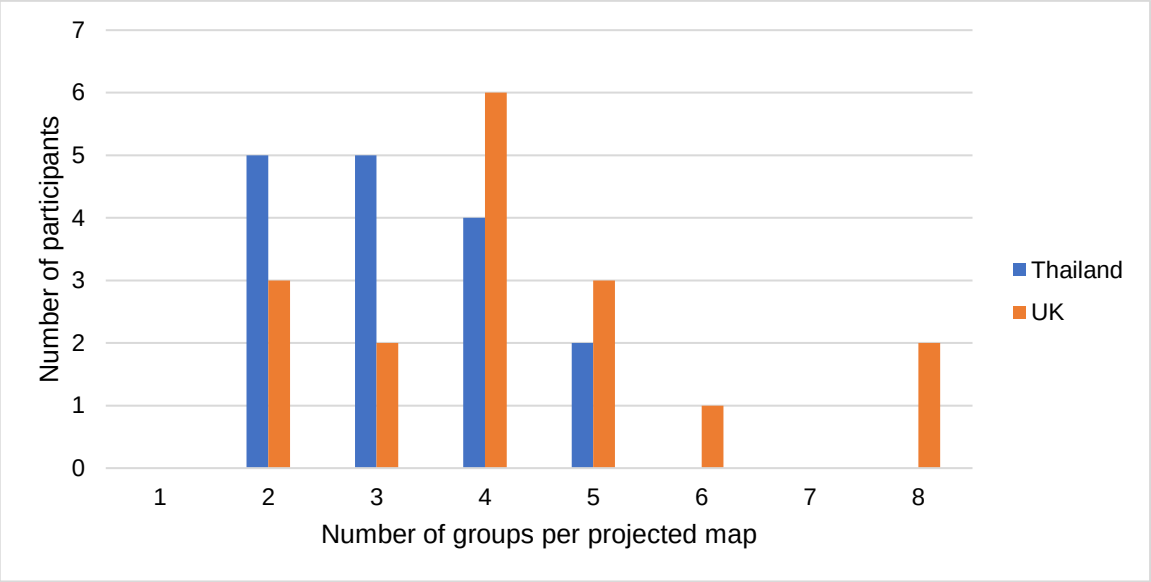


Figure 21 Number of groups of dining situations that Thai and British people arranged on their maps

Factors that participants used to map the dining cards, and how many times these criteria were applied across all participants, are shown in Figure 22. Most participants used more than one criterion to group the dining cards. It is interesting to see from Figure 22 that people did not usually judge meal scenarios based on only one singular factor, although there are a few times people considered price, place, and plan factors individually. Most participants considered two factors at the same time. On very few occasions, people would use more than two factors as grouping criteria.

Overall, the interaction between the place of dining and the price of the meal per person was the primary criterion, particularly among British participants. Thai participants mostly used the commensality in meal situations together with the place in making a FW decision.

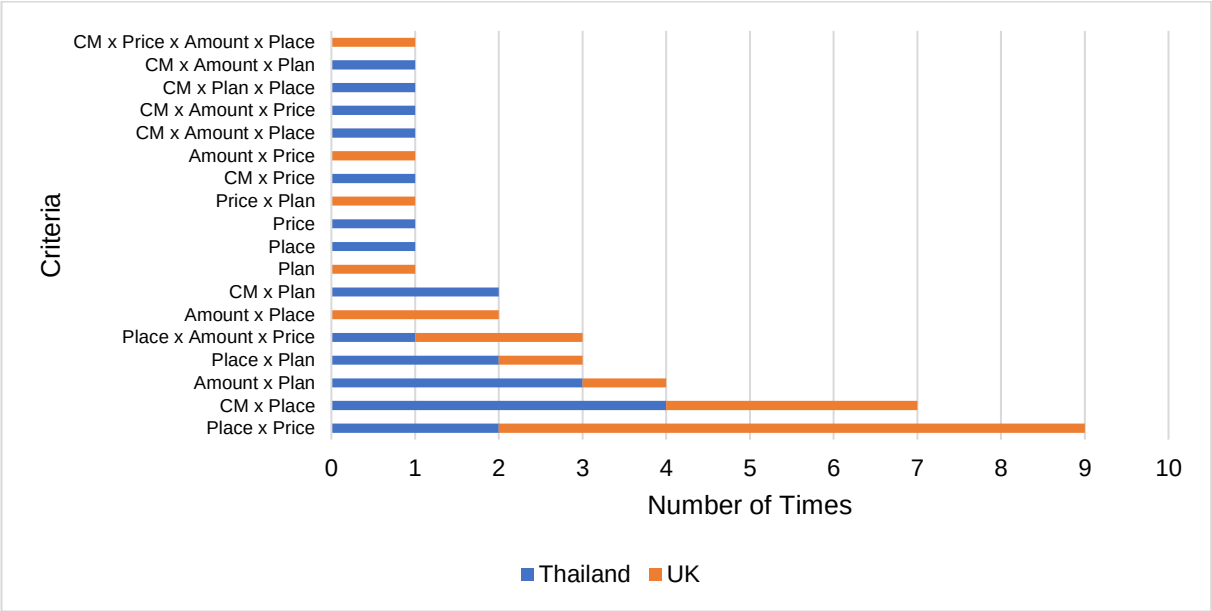


Figure 22 Mapping criteria and the number of times that criteria were used[32]

For convenience in explanation, groups of scenarios and attributes are presented in Table 25 which show groups of meal scenarios often grouped together by participants.

Table 25 Scenarios of dining cards in the PM task

Groups	Scenarios	Commensality	Place	Cost	Amount	Plan
1	3	with others	home	500 ฿ (£30)	whole	with plan
	2	alone	home	100 ฿ (£6)	whole	with plan
	6	with others	home	500 ฿ (£30)	half	no plan
	1	alone	home	100 ฿ (£6)	half	no plan
2	4	alone	restaurant	500 ฿ (£30)	whole	no plan
	5	alone	restaurant	500 ฿ (£30)	half	with plan
3	7	with others	restaurant	100 ฿ (£6)	half	with plan
	8	with others	restaurant	100 ฿ (£6)	whole	no plan

It is quite apparent that there are strong links between dining scenarios number 3, 2, 6, and 1 from the pooled data and the data from each country. Place of dining and food price seems to be the top criteria participants used to arrange the meal cards. While there were many times that consumers grouped these four scenarios particularly

[32] CM = Commensality

among the UK groups, Thai participants were likely to split scenarios 3 and 2 from 6 and 1. Additionally, scenario 5 was usually put next to 4 and scenario 7 was most likely perceived as the same as scenario 8. Group two involves meal situations about more expensive meals, eating on their own in a restaurant whereas group three shows cheaper meals, eating with others out in a restaurant. Moreover, scenarios 7, 8, and 5 which were also highly likely to be separately arranged as a singular card on the PM maps, particularly by the UK participants.

Keywords that explain each group of scenarios (3-2-6-1, 5-4, and 7-8) are about the ability to save the leftover food for later by putting it in a fridge or a freezer. The situations in the first group (3-2-6-1) are all based on eating at home. Particularly among Thai interviewees, an interesting comment was made about *"self-reliance"* or *"the ability to make a decision"*. In other words, for Thai consumers, it was mainly about how easy it is to decide how to deal with the remaining food. On the other hand, British participants emphasised how *"convenient"* it is to save or pack up the leftover food when being at home when compared with when dining out.

Both Thai and British participants agreed that the future meal plan in scenarios 3 and 2 could be adjusted or rescheduled. As for the scenarios of having no future meal plan (6 and 1), an interesting comment from a Thai mother of two children is *"…that half lunch becomes a plan for the next meal"* (Participant 20, G2, F1, Thailand). Most participants said that a future meal plan could be adjusted and less focused. In this group of dining situations, cost and the commensality also seem to play less of a role in mapping than the dining place, unlike the group of scenarios 5,4,7, and 8.

Dining situations number 5, 4, 7 and 8 do not seem to have enough incentive for assessors to reclaim the leftover food. Some participants were concerned about the fact that the meals involved other people in a restaurant setting. Other participants used the food price (100 Baht or £6) as a critical indicator in making a CFW decision. Particularly among British participants, there was a sense of *"stigma"* when considering taking food home from a restaurant in front of other people. More specifically, when the food was considered of lower value (scenarios 7 and 8), the likelihood of asking for a *"doggy bag"* was less than scenarios 5 and 4 because of *"embarrassment"* or fear to be perceived as being *"cheap"*. There were five participants from each country who explicitly stated they would rather leave the remaining dinner from either situation 7, 8, or both 7 and 8 at a restaurant. However, a few people from both countries pointed out that *"it depends on the quality of the food"* (i.e., type of food, deliciousness, or the

possibility of packing and eating it later). For a couple of Thai participants for scenarios 5 and 4, another reason for saving that food was about the non-involvement of other people. They considered the food when dining alone would not be *"contaminated"* and they were *"able to decide to take the food home"*. One female British participant expressed a similar idea about "trust" regarding restaurant food because she did not know how the food has been prepared and would not save it.

In the next five sections, FGD results recorded when we asked participants to express their views and tell us about their FW experience based on five individual factors: 1) commensality during a mealtime; 2) place of dining; 3) food price; 4) amount of leftover food; and 5) future meal plan will be presented.

5.5.4 Opinions about CFW and CFW behaviour based on each factor

5.5.4.1 Factor 1: Commensality

When probed about the influence of other people at mealtime, we found that participants were likely to consider this factor together with other factors, particularly the place of dining. In general, the influence of this factor is varied by relationship types between people. For British people, it was about ownership of the food. For Thai consumers, there was a stronger theme of social hierarchy. The following sections will explain more in details.

The UK

Table 26 provides an overview of the discussion among UK participants. While the capability to manage the food better while eating alone, there are more aspects emerged from the British groups when dining with others in different situations. Mainly, it was about ownership of the food, which has two divergent discourses: 1) it is not appropriate to save leftover food when dining with other people or 2) it does not matter if one does so.

British participants agreed that, when eating alone, they would be able to make decision to order or cook food the right amount of food. One participant reported that *"the more people, the less planning you can do about food."* (Participant 9, G1, M1, UK). One explanation given by another person is *"You can never know who's not going to be hungry."* (Participant 6, G1, F1, UK). Therefore, food can eventually become FW.

In addition, with the presence of other people in a meal, the consumption would be less due to distraction from other activities such as chatting, as one said: *"The more people, the more distraction there is like probably not caring too much about food that I'm wasting or taking with me."* (Participant 2, G1, F1, UK). Nonetheless, the situation might be the opposite because it might depend on the personalities of people in the meal, as one interviewee commented: *"One of my friends would shame me if I have leftover food [So I should not have any food left]."* (Participant 2, G1, F1, UK).

Some British interviewees felt that claiming leftover food from the table or someone else's plates was perceived as *"rude"*. Two reasons emerged from this. First, it was because they are not the person who would pay for the food and therefore a) should not claim the leftover food or b) would rather finish the food. Second, the banquet is formal (e.g., in a business setting or with someone) and claiming the leftover food after a meal is not a polite way to behave. Examples of statements that reflect these ideas are;

> *"I'm less likely to save [leftover food] if I'm with acquaintances or people I'm less familiar with in business settings. If I've gone with work colleagues, I'd unlikely to say 'can you pack this to go for me' at the end of the meal. It's a bit odd and maybe a bit rude, not professional. I think if I'm honest, if I'm with friends or family, we both packing, it's all good. We know each other. We're familiar with each other. What if we're with colleagues, the you would probably go somewhere afterwards, it would be inconvenient to be carrying something around."* (Participant 16, G1, M1, UK)

> *"If it's a non-friend perhaps it's a business meal, I would feel uncomfortable saying 'I know they paid for that, and there's a lot left over. Can I take it?' I would feel uncomfortable saying that 'cause I would feel that is rude."* (Participant 30, G2, M1, UK)

> *"In a business meeting and I can't eat half of it. I just finish it rather than leave it. That's in front of anyone."* (Participant 6, G1, F1, UK)

"I've been in a situation when I went for a meal with all lecturers. The food was gross, but I was going to eat it because I'm not going to complain or be displeased by it because they're paying. That's a big thing if somebody else is paying for the food I'm going to eat that food, or I'll keep it or offer it up." (Participant 2, G1, F1, UK)

However, a couple of other British consumers responded differently. They said, *"I don't care", "I wouldn't mind"* or *"You can do what you like"*. Although some of these people agree that they would not want to take other people's food home, they shared alternative behaviour to overcome this challenge and be able to save the food particularly when there is a lot of food left. They would offer the leftover food out to other people first such as *"'Does anyone else want to take this home?' and then everyone will say no and I'll be like 'oh great' [I will take that.]."* (Participant 11, G2, F1, UK).

Table 26 Summary of UK consumer experience and feelings about the commensality

Situations	Experience / Feeling
Eating alone	• More ability to plan and control the amount. • Being able to finish the food with less distraction.
Eating with others	• Likely to have more FW or leftover food due to lower ability to control or to plan. • Distracted by chatting and not caring about FW or leftover food. • Saving the food depends on who pay the bills. • If someone else pays the bill, they rather finish the food. • Rude to take the leftover food from other people's plates or the table.

Thailand

Participants in Thailand also focused more on the eating out context when discussing the influences of other people in a meal setting on CFW behaviour and less experience about eating alone. Table 27 provides an overview of the discussion by Thai participants. A recurrent theme in the group discussion was a sense among participants that food may be wasted less when dining with people with whom they are familiar, e.g., friends. The more people involved in a meal, the more enjoyable and

delicious the meal is. As a result, food is likely to be finished. Another group of participants also said that, the more people in a dining situation, the higher chance the leftover food would be saved because they would encourage each other to do so. One participant said:

> *"When we have leftover food, I would also invite other people who are eating with me to take leftovers back with them. Give it to their house mates. Give it to other people who might want to eat."* (Participant 29, G2, F1, Thailand)

However, there is one participant who also pointed out about the uncontrollable amount of food when dining with friends and said:

> *"If I eat with my friends, they will order too much. Then I tell them I don't want to eat that much. In the end there are leftovers. And they will encourage me to eat. If I order, it will be an individual dish and there will be shared dishes to eat together."* (Participant 19, G1, M1, Thailand)

Furthermore, some participants claimed they would be more confident to save the food if others in the table started to do so. One participant commented that *"If my friends ask to wrap the leftover food, then I will do the same. If I eat alone, I don't want to do that. I will just leave it there"* (Participant 15, G2, M2, Thailand). Almost everyone in both groups in Thailand agreed that it also depends on who pays the bill and women who have a mother role were likely to be the one who took care of the leftovers when dining as a group. One senior male participant noticed: *"if it's a shared meal with other people, there will usually be food left in the middle because we would order a lot, and I don't want to take the food home. But it's different with women. They like to organise and split the food to take home."* (Participant 31, G1, M2, Thailand).

Another highlight from the Thai FGDs is about FW when eating out in a formal meal with the presence of more senior people who are above them in the social hierarchy (e.g., VIP, older family members, and more senior work colleagues). This theme from the Thai participants shows a significant difference from the UK groups. Many participants described the situation when sharing the food with the people mentioned earlier as *"difficult"*, *"uncomfortable"*, or people would be *"not confident"* and *"not relaxed"*. It is a situation creating more FW when compared with a more relaxing situation or with eating alone. The majority of participants said that *"I would not dare to*

eat a lot in front of people who are more senior. Even though we want to eat so much, we will have to let those people have more or eat first." (Participant 12, G1, M2, Thailand). Most participants revealed that the situation usually involved having plenty of food on the table with a lot left. It is also quite rare that anybody would save leftover food in front of those "important people".

While there is evidence showing that CFW behaviour is influenced by the commensality in a meal setting, a couple of participants per country commented that their behaviour is not related to the fact that there are people in the dining situation, commenting, for example: *"For me, it doesn't make any difference."* or *"this factor is not significant. I don't waste either way."*.

Table 27 Summary of Thai consumer experience and feelings about the commensality during mealtime

Situations	Experience / Feeling
Eating out alone	• Might not be confident to ask for taking the leftover food away.
Eating with others	• Will take leftover food home if other people do. • Friends order too much and have leftovers. • Social hierarchy • Appetising. Eat a lot, might mean waste a lot if do not finish all the food. • Women will be likely to save food more often than men. • Not confident to eat a lot and might have leftover food.

5.5.4.2 Factor 2: Place of dining

CFW behaviour is likely to be different depending on whether the meal takes place at home or out of the home. This factor tends to clearly distinguish consumers' decisions to save or not to save leftover food. There are two distinct themes in the responses: 1) convenience and 2) types of food or restaurant.

Convenience

The theme of "convenience" recurred throughout the data from both the UK and Thailand when discussing the place of dining as a factor of CFW behaviour. This idea also emerged across the whole conversation for all FGD groups, which reflects that it is a primary reason for consumers from both countries and among other factors.

Participants usually referred to how easy it was to save leftover food. At home, it could be conveniently kept in a refrigerator or a freezer with less effort, as one participant noted: *"I don't usually waste food at home, but I can always find something to do with food that is left because there's always the freezer."* (Participant 33, G2, F2, UK) Moreover, *"I save it all. But if it's at home, it seems to be easier to keep the leftovers."* (Participant 21, G2, F1, Thailand). It is more *"inconvenient"* to save the food from a restaurant, as a female university student from Thailand expressed: *"It is about how convenient it would be to take [leftover food] back. For example, I go to Siam Square to eat. I don't drive there. I use public transport. if I eat and I have leftovers, I won't take it back because it isn't convenient."* (Participant 17, G1, F1, Thailand). Another young male from the UK also said that: *"I don't want to carry food around everywhere I go. At home, it can go straight to the fridge."* (Participant 16, G1, M1, UK). Therefore, food is less likely to be wasted at home because any leftovers can be kept easily.

While there seems to be less FW from meals at home when compared with out-of-home, there are other concerns expressed by participants, particularly about having more household FW because of saved leftovers. People could not guarantee that the kept leftover meals will not be wasted at home afterwards. British people raised an issue about the insufficiency of refrigerator space, as one commented: *"…no matter how much food you are willing to save, there is this matter about fridge space at home. Sometimes I have tried to save the food I have left, but I can't store it. It's a waste."* (Participant 4, G2. F2, UK). In addition, one Thai participant noted that "*leftovers saved from a meal, either from a home-cooked meal or from outside, can accumulate and we bin them all later*. *My mum likes to buy food, and we save a lot and put it in the freezer. At the weekend, I'm the one who has to sort it out and bin most of it anyway."* (Participant 25, G2, M2, Thailand).

Types of food/ restaurant

The food at a restaurant was criticised as one of the main reasons why food is more likely to be wasted and leftovers are more difficult to save when eating out. Overall, consumers made FW decisions based on types of food that were served in a restaurant. For example:

> *"If you go to an Indian or a Chinese or not as much as Italian but Indian and Chinese and Thai or Asian, it's tempting, and people tend to order a number of dishes. Put it in the middle*

and then everybody picks from them and I think in that situation we often order too much food." (Participant 33, G2, F2, UK)

Another younger British woman argued another point. Her decision to save the food was based on a combination of the type of food and the presence of other people in a dining situation, and about the self-consciousness of being seen as greedy by fellow diners. Another half of the participants also had a similar experience. She said:

"I guess we like shared food like tapas restaurants. I don't know if you guys at curry houses do the whole in the middle thing. In that case, if there's like that food left, I don't wanna be like "mine!" cause there may be like four other people who have been eating that whereas if I have one individual plate, I can make a decision then. But if it's a shared food, buffet situation, I don't wanna be that person to be like "I'm gonna take this". I've done this with my family, but otherwise, I would feel slightly mean doing that." (Participant 2, G1, F1, UK)

A retired male participant from Thailand also highlighted this similar idea:

"…Our eating behaviour is like this, particularly in Chinese restaurants, there will surely be food waste. This is the problem. The way Thai people eat is not the same as the way westerners eat. Westerners' way of dining is about their plates. The individual dish is for each of them, put in front of them. They have their dishes. Thai or Chinese people will order a lot and have shared food in the middle. If there are ten people, there will be 12 dishes. There will be food waste." (Participant 31, G1, M2, Thailand)

5.5.4.3 Factor 3: Price

From the group discussion, the overall ideas revealed that consumers did not want to waste food because it is too "valuable" to be wasted despite the price. However, for some other people, the higher price of food would reinforce their decision to not waste the food, whereas lower-priced food could sometimes be left uneaten.

When consumers buy or cook food, they see the "cost" in the whole process. Wasting food is equivalent to wasting their money, time, and energy. An issue highlighted

equally by both Thai and British groups, particularly by people from the older generation, was that they would not waste any leftover food, regardless of how cheap or expensive it was. An example of a statement from the UK group is: *"I think £6 or £30 are the same because you don't want to waste still."* (Participant 18, G2, M1, UK). The same sense emerged from Thai interviewees. Many of them agreed that: "*I save them all no matter how cheap or expensive it is.*".

When asked to focus on different food prices (cheap and expensive), some participants also used the cost as part of their FW decision process, as shown in Figure 23. Expensive food would reinforce consumers not to waste the food or to save the leftovers because of money invested in it or due to participants' economic status. Two young British adults similarly reported that the food price prompted them to save the food, as one put it: *"The price just reinforces the fact that I don't like wasting it. So, the price reinforces that. If the food costs more, then it reinforces the importance for me to make sure its value is returned."* (Participant 1, G1, M1, UK).

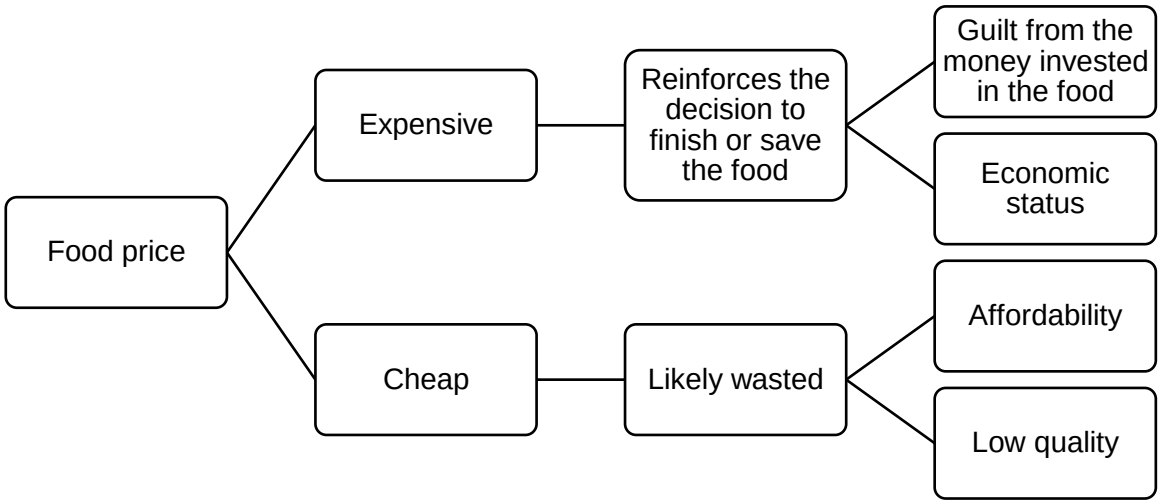


Figure 23 Thoughts from the discussion about food price as a factor of FW behaviour

Income seemed to play a role for some Thai participants, who thought that the price has a significant effect on their CFW decision. They commented that they were not from a wealthy family and food contributed to a large sum of their disposable income. Therefore, saving food could prevent them from spending more money. One of them said: *"…even 100 Baht is expensive for me. 500 Baht meal is not a normal meal for me. I will pack up the leftovers because I want to save money."* (Participant 28, G1, F2, Thailand).

On the other hand, a couple of consumers talked about when the food is cheap. One Thai participant said: *"In general, food in Thailand is cheap and it is everywhere. We can eat at any time. Sometimes when I eat out with my family, we eat half of it and waste half."* (Participant 19, G1, M1, Thailand). On the other hand, it was junk food that is perceived as cheap food, as mentioned by a few British consumers. One retired male participant commented: *"I don't leave stuff but I think the younger generation always, well, I get the impression particularly children do because food is cheap, like junk food, and I think food is possibly too planned for them and too cheap in our culture."* (Participant 8, G2, M2, UK).

5.5.4.4 Factor 4: Amount of leftover food

The significance of the amount of food in a meal situation seems to be at an equal level between British and Thai participants. There was a clear message representing both groups that the amount of leftover food has to be "enough" for consumers to save for eating later (e.g., *"enough portion to make a meal"* or *"the right amount that can be managed later"*). Some consumers would not make FW decisions purely based on the amount but would take into consideration other factors such as place of dining and type of foods.

However, as shown in Figure 24, there are two CFW decisions in the situation when the leftover amount is small. The majority of the answers from the UK group revealed they would rather finish the food, as one put: *"I would just chuck it down."* (Participant 13, G1, M1, UK). Nonetheless, more than half of Thai participants said: *"I won't take it if it's too little"* and another idea from a few others was in line with British participants' experience.

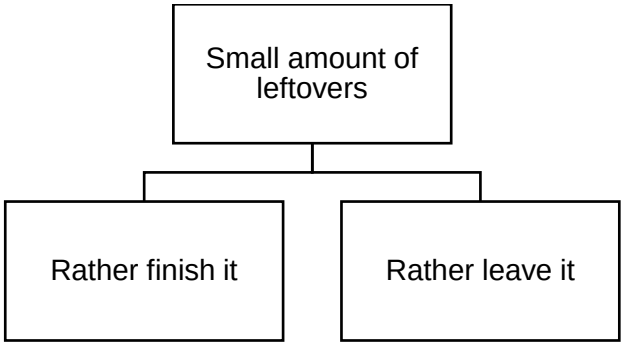


Figure 24 CFW behaviour when there is a small amount of food left after a meal

While most people agreed that food was more likely to be wasted if there was a smaller portion left, a few participants seemed to have further aspects to consider together with the size, such as palatability of food, type of food, and place of dining as shown in Figure 25.

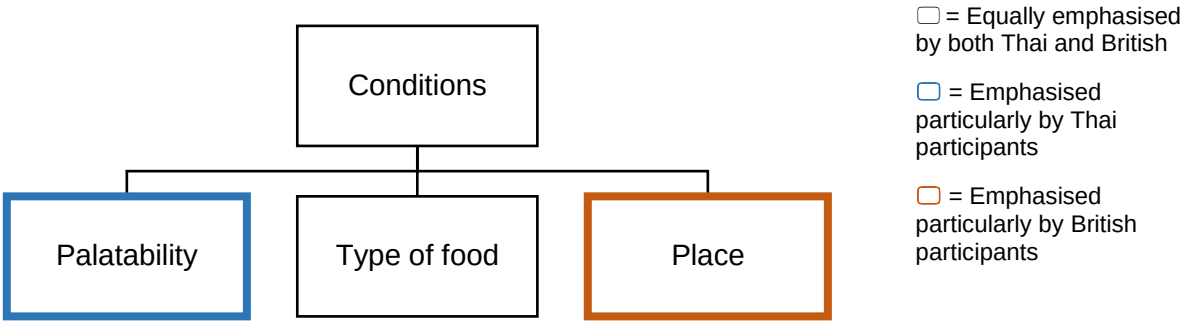


Figure 25 Factors which are considered alongside the amount of leftover food

Half of the Thai participants would not be sure if they would want to waste the leftover food when the food was tasty. Even though the amount of food left was small, there might be a chance that participants would decide to save it for other occasions.

On the other hand, a few British participants used both the place of dining and the amount of leftover food to make CFW decisions. They would keep the leftovers in the fridge when they were at home even though there was little left. One British also struggled to save food from a restaurant as he said, *"maybe in a restaurant, if it's like too much for me to eat but not enough to take away, then maybe I'll leave it"* (Participant 13, G1, m1, UK). For both British and Thai people, if the food is in forms such as in pieces which are easily packed (e.g., fried prawn cakes for Thai and meat for British participants), they would consider saving the food, regardless of the small portion size of the leftover food.

5.5.4.5 Factor 5: Future meal plan

Most participants claimed that future meal plan has no impact on their CFW behaviour. Overall, the rationale behind this lack of correlation is the fact that a future meal plan is flexible, adjustable, or can be rescheduled. Examples of British people's statements that many participants agreed upon are:

> *"My schedule just updates itself. So, if something's prepared for me for tomorrow's lunch and I have this amazing dinner today, and this leftover today, then today's leftovers become tomorrow's lunch and tomorrow's lunch becomes tomorrow's dinner."* (Participant 1, G1, M1, UK)

> *"I would just adjust. If I've got something planned for tomorrow, then whatever I got planned for tomorrow will be the next day or something else."* (Participant 30, G2, M1, UK)

Strong statements from a Thai participant are:

> *"It doesn't matter if I have a plan for the next meal or not. No. Not that I wouldn't eat or wouldn't pack it to take away, no."* (Participant 31, G1, M2, Thailand)

> *"I would be able to adjust the plan. I can change the plan even though I've the meal plan already. We can always store in the fridge. There's a freezer."* (Participant 29, G2, F1, Thailand)

However, a few participants, particularly young Thai participants, argued that they do not usually plan for meals in advance, as one put: *"Actually I don't really plan because I'm easily bored. I also usually eat out in the university canteen or a restaurant."* (Participant 17, G1, F1, Thailand). There is one piece of evidence from a young, male, British consumer as follows:

> *"I don't think it affects me cause like, to be honest probably less than 1% of all days that I ever planned for meals and I will have 24 hours in advance. Maybe lunch I'll think about the night before, but dinner is always just like what I fancy then. So, I have stuff, and I sort of see what's going on for, see what I fancy from things I have."* (Participant 13, G1, M1, Thailand)

Additionally, there is a minor argument for the correlation between having FW and meal planning. Although the prominent theme in the discussion in this topic shows that the future meal plan is adjustable to accommodate leftovers from one meal, hindsight from a Thai FGD group revealed that food could also be wasted. For example, one admitted: *"If we are going to eat out which is arranged offhand, food from the original plan could end up in a bin."* (Participant 26, G2, F2, Thailand).

5.5.5 Other factors and ideal situations

Table 28 presents the additional factors which could influence people's likelihood of wasting or saving food at a mealtime. There are four main factors. Participants from both countries highlighted most of the same factors. Only the "use of serving spoons" emerged from Thailand FGD groups.

Table 28 Prominent factors affecting FW behaviour in addition to the factors introduced by researchers

Factors	UK	Thailand
Lifestyle	✓	✓
Liking	✓	✓
Mealtime	✓	✓
Use of serving spoons		✓

5.5.5.1 Lifestyle

Both British and Thai Participants referred to the idea about consumer lifestyle the most. An ideal situation for having no FW for some British participants would be *"plan food in advance"* and *"eat the same thing to avoid wasting food"*. Nonetheless, one male British professional argued: *"But if you have a busy week, stuff comes and you're not expecting. All your plans kind of fall through. You're out so not available to get things out of the freezer. I think that can affect food waste, how busy we are, your lifestyle."* (Participant 18, G2, M1, UK).

For Thai people, *"rush hour and busy life"* are the ultimate lifestyle-related scenarios for plate waste. The experience of time limitation per meal was described by some Thai participants, such as when *"having food in a car in the morning"*. In addition, a couple of young Thai adults (Participants 5 and 19) admitted that: *"We don't have much time for a lunch break. Sometimes we just leave our food unfinished to go back to work/ study."*

5.5.5.2 Liking

It is no great surprise that people would not throw away the food they like. One British lady instantly came up with an example: *"a nice pudding"* and another person from the same gender agreed that *"[Wasting food] depends if you like it or not. That would make*

a big difference!" (Participant 7, G2, F2, UK). The assertion from most Thai people also showed that food preference and taste have a considerable effect on their decisions. A couple of Thai participants confirmed that there would be no FW *"if it's delicious!"*. Ideally, food that meets everyone's level of quality is probably not going to be wasted.

5.5.5.3 Mealtime

The experience about mealtime as a factor of CFW behaviour is not only mentioned in this particular session but also across all the FGD sessions. Two aspects emerged from this particular theme. First, a small gap between two meals would result in having a higher likelihood of having FW. Second, food is wasted at one particular meal rather than the others. When mealtimes are scheduled by someone else, or consumers' plans involve two meals separated by a short gap, the chance is that consumers are not hungry, resulting in having FW. An example is given by a young adult in Thailand:

> *"It's like two meals in a short time span…because I join different groups of people for those meals. So, the next meal that comes right after shortly, I can't eat. I can't finish."* (Participant 19, G1, M1, Thailand).

Another situation highlighted by a British woman is about mealtimes and serving size:

> *"I was once [at] a conference. We had one big meal and then another big meal right after, massive meals. Nobody would have thought of embarrassing the host by saying, sorry we can't eat this. But really there was a lot of food waste that day."* (Participant 3, G1, F2, UK).

In terms of a specific time, breakfast and dinner were two meals for FW situations for Thai participants, but it was only the dinner time for British participants. The situation about FW and breakfast time for Thai participants was because of rush hour as mentioned earlier. For dinner, one main reason was given by a participant who said: *"…dinner is a big meal, and it is when everyone is together. If we have leftovers from dinner time, we can keep it for eating later like the next morning."* (Participant 22, G2, F1, Thailand).

For the UK, it is similar to Thailand regarding saved dinner*: "dinner tends to be the largest meal."*, but the leftovers will be consumed the next lunchtime rather than the next morning. For example, one said: *"I don't save breakfast because I tend to eat it*

all. And lunch, I tend to eat it all because that's what you need. So, for me, probably dinner." (Participant 4, G2, F2, Thailand).

5.5.5.4 Use of a serving spoon

The fact that food which is shared with other people in a meal is served with a serving spoon is deemed to be significantly important for FW decisions for Thai participants only. Among the British groups, the issue about using a serving spoon was not an actual subject of the discussion because the food was most of the time served individually and one would always use a serving spoon. In Thai, a serving spoon is called a *"shon klang"* or a "middle spoon" if directly translated into English. It is used with shared food which is placed in the middle of the dining table to avoid using personal spoons people put into their mouth. Many of Thai participants pointed out that: *"Without using the shared spoons, I'm not going to take the leftovers home."*. One Thai lady added more details: *"If there is a full dish left, the middle spoon is important. No middle spoon, I'm not going to keep those leftovers."* (Participant 23, G2, F2, Thailand). When being asked for reasons, one participant stated that: *"A Thai meal is a shared meal with food served in the middle. It's contaminated with other people's saliva if people use their own spoon to take food from the main dishes to their plate. We don't want to eat it again. If we keep it, it will be spoiled."* (Participant 31, G1, M2, Thailand). Therefore, another key factor for Thai people's FW decisions is the use of a serving spoon. If fellow diners have already used their own spoon, there is a high possibility that the leftover food will be discarded.

5.5.5.5 Other ideal situations

Overall, additional situations described by participants revolved around the place of dining and food specifications. A meal "at home" is the ideal situation for having the lowest chance of food being wasted for both Thai and British consumers. Mostly it is because food can be conveniently managed, e.g., saved for later in a freezer. More specifically for some British people, having food that has a long shelf-life (e.g., "canned vegetables") or if it is easily kept in the right condition was claimed to be another perfect circumstance for having no FW. One British female university student gave an example: *"Things like lasagne or pasta bake, so the stuff you kind of like put in a tray and you can like divide it into sections and like put some in a freezer or put some in the fridge. The kind of stuff that you could really like portion away"* (Participant 2, G1,

F1, UK). For Thai people, there seems to be no particular comment about perishability and types of food like the British consumers' experience. However, when being asked to confirm a situation where there would not be any FW, almost everyone said that "tasty food" is ideal.

5.6 Discussion

This present study showed that in-depth information from participants have provided more details to complement findings obtained from the quantitative analysis. In line with Quested et al. (2011) and Roodhuyzen et al. (2017), we found that CFW behaviour is complex and tends to involve multiple factors that affect how consumers decide to waste or save food. For the purpose of comparison between countries, we found some similarities and differences between the two groups of participants. However, our results are based on a qualitative study and therefore the findings are not conclusive for the overall population in both countries. The findings are instead interpreted as a route to explore more in-depth opinions, experience, and expectations of CFW, particularly in relation to the five main factors.

First, we found that British and Thai participants had different mindsets when they discussed FW in general. British people's opinions about FW were in the area of food in a supermarket setting and preparing a meal at home. British people's opinions about CFW linked more with the stages of food shopping, planning and cooking. These results are in line with Quested et al. (2011), Graham-Rowe et al. (2014) and Grasso et al. (2019). On the other hand, Thai people would be concerned more about the FW due to attributes of food, e.g., food taste and portion size particularly when eating out. One possible reason for these different mindsets could be traced from eating habits. Previous studies show that the majority of British people dine out only once a month or less and cook at home almost every day (Lewis, 2017; Mills et al., 2018). In Thailand, there is high availability of street food vendors and other dining places away from home, and average Thai people usually eat out 56 times/month (Sirikeratikul, 2018; Krommuang et al., 2017). The current FW policies in both countries also reflect this observation; the UK measures involves FW reduction activities from shopping, cooking, and eating whereas FW in a restaurant that is more concerning in Thailand despite a lack of attention about this issue in Thailand (Love Food Hate Waste, 2015; Quested, Marsh, et al., 2013; FAO, 2014b).

Second, consistent with previous studies (Graham-Rowe et al., 2014; Connell et al., 2016) but in contrast with Principato et al. (2015), our findings show that participants from both the UK and Thailand did not want to waste food from meals because of money invested in the food. One of the policy strategies in the US also uses this aspect to encourage American people to waste food less. A policy from the UK also points out how consumers can save money from saving food (Quested, Marsh, et al., 2013). Moreover, participants also valued the time and effort someone has spent on cooking it. This value is consistent with Lusk and McCluskey (2018), Graham-Rowe et al. (2014), Ellison and Lusk (2018), and Sirieix et al. (2017).

These results also shed light on the factor of the price of food. Food cost affects CFW behaviour for reasons of cost-saving, particularly from participants who are not from a wealthy background. This result is in line with Delley and Brunner (2017) who found that there was a group of consumers who would not waste food mainly due to financial reasons. Not only the price of a meal was considered important for participants in this study. Other costs and difficulties in acquiring food prevent consumers from wasting food, which is consistent with findings in McCarthy and Liu (2017). Most participants were aware of efforts which have been put into food production along the whole food supply chain, e.g., time and resources invested in growing vegetables or raising livestock and cooking that meal. In Becker (1965)'s model of household production, people would make consumption decisions (i.e., wasting food in this study) based on these inputs such as time spent on cooking, cost of ingredients, and the consumer's income. In other words, in order to gain utility from a meal, consumers would have to discount their time preparing the food. This would have a significant effect on their decision and would prevent them from wasting the food they have invested. Graham-Rowe et al. (2014) and Ellison and Lusk (2018) also found a similar outcome. Consumers would want to save their opportunity cost by saving leftover food, particularly when they do not have a plan for their next meal. On the other hand, people who are not aware of these costs, such as those who live far from farms or young consumers who have less experience of food production or cooking, tend to easily waste food. Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer (2015) showed consistent findings where difficulties in visualising food production was one of the causes of FW.

Moreover, our findings show that both British and Thai participants cannot finish food due to their own health requirements, physical conditions, and diet preference. These results are corroborated by Secondi et al. (2015), Block et al. (2016), Robinson and

Hardman (2016). This was particularly the case among women who wanted to control their diet and the amount of food they consume (Lorenz, Hartmann and Langen, 2017). On the other hand, in line with previous studies (Ponis et al., 2017; Lorenz, Hartmann and Langen, 2017; Birisci and McGarvey, 2018; Aschemann-Witzel et al., 2019) recent projects found that the serving portion size also mattered for CFW, both when participants serve themselves or when they are served by a restaurant.

Third, for the purpose of gaining an in-depth understanding of the influence of five dining factors, discussing individual factors was challenging because most participants considered the interaction between more than one variable at the same time. Moreover, each factor sometimes did not hold constant significance but instead varied according to different dining situations; Quested, Marsh, et al. (2013) also found this complexity. Looking at the broader picture, the place of dining plays the most important role in CFW decisions in saving leftover food, followed by food cost. Overall, when having meals alone at home or at least with people they know quite well, the amount of leftovers were larger, and a more expensive meal would have a lower chance of having FW when compared with other situations. Meal planning did not seem to have any influence on saving leftover food. If there was any leftover food, it would most likely be saved. These results comply with Mirosa, Liu, et al. (2018) and also Ellison and Lusk (2018), although the latter found the most important factor to be the amount of leftover food.

British participants' CFW behaviour was likely to be influenced by the commensality and the amount of leftovers due to social expectation. This result is corroborated by Mirosa, Liu, et al. (2018) particularly when dining in a restaurant. UK diners had a tendency to not ask for a doggy bag when there are leftovers in a restaurant and the amount of food left is little, which is quite different from Thai consumers. The factor that would hinder them from saving leftover food to reduce FW is self-consciousness (i.e., the perception of being poor or cheap). This is the most obvious factor that differentiates people between the two countries and provides an in-depth explanation for the results in the quantitative study. Previous studies in France, Czech Republic, and New Zealand (Sirieix et al., 2017; Mirosa, Liu, et al., 2018) also presented the same attitudes of consumers, which is that asking for a doggy bag is not usual. On the other hand, it is a common practice to claim leftover food in restaurants in Thailand. This opinion from Thai participants is in line with "American culture" (Gambardello, 2013; Sirieix et al., 2017). One possible explanation would be differences of social norms held among different groups of people (Casson, 1997; Pliner and Mann, 2004;

Lally et al., 2011; Brennan et al., 2013). The aversion or disapproval from other people in society is called “sanction” in the literature about normative beliefs (Elster, 1989; Bicchieri, 2017). It prevents some consumers from taking leftover food away due to perceived social judgement. In Thailand, there is a higher possibility that there would be more FW when participants were having a meal with other people in a restaurant due to how Thai food is served (i.e., shared and sometimes without using a serving spoon) and the feeling of having no right to claim the host’s food, particularly those who are more senior or having higher rank in the social hierarchy. This supplements the findings from the previous chapter of quantitative analysis that the interaction effect between the two factors (presence of other people and place of dining) is significant for Thailand.

To add more in-depth information, the place of dining also depends on the type of restaurant. Buffet-style restaurants were criticised for being types where CFW behaviour could be influenced. The fact that diners can take as much food as they like for a fixed price might encourage people to serve themselves more than they can finish, resulting in avoidable plate waste (Priefer et al., 2016). Results from Just and Wansink (2011) showed that price is a key driver influencing consumers to take too much food from the buffet. Therefore, consumers in this dining environment are prone to create more FW.

Fourth, an in-depth explanation about why future meal planning has a low impact on CFW could be how flexible meal plan is. This is in contrast with the findings from Farr-Wharton et al. (2014) whose participants found that meal plans were often interrupted by an ad hoc events (such as changes of where the meal was taken place or meal friends), resulting in more CFW at the end because food was cooked but could be uneaten. Our findings show that participants are more flexible with the leftover food plan, reschedule their meal plan, and how they manage the food to have no or less FW. However, this factor is the most concerning factor and needs further investigation because we cannot conclude that there would not be any FW after time has passed (i.e. after the plan has changed and kept food could be discarded later even though participants promised the food will not be thrown away) (Mallinson et al., 2016; McCarthy and Liu, 2017).

5.7 Conclusions

The primary purpose of this study is to uncover CFW experience and in-depth opinions about FW drivers, mainly to supplement numerical findings in the previous quantitative study. Moreover, it also intends to compare these in-depth findings between British and Thai participants in response to thesis objective 2 (research question number 2.1 and 2.2). The limited number of participants included in this study (the UK: n=17, Thailand n=16) did not permit generalisation of the results regarding the overall target population for the UK and Thailand. The findings are rather for an in-depth understanding of consumers' experience, reasons, and expectations of CFW behaviour, particularly in relation to the five main factors of interest.

The results suggest that CFW behaviour is influenced by multiple factors with complicated interaction between factors in a meal setting. In the context of meal food and FW, British people are more concerned about behaviour in the stages of buying, planning, and cooking food before it becomes a meal, whereas Thai consumers' CFW behaviour would depend on the intrinsic quality of the food, such as taste. Among the five dining factors of interest, the place of dining has a significant impact on consumer's FW decisions. While UK participants would not want to take leftover food home when eating out because of social stigma, Thai people would not mind doing so. In contrast, eating at home allows participants to save leftovers more conveniently. Participants from both countries considered the price of food alongside other values of the food (e.g., time and effort spent on cooking) and would not want to waste it. There are other factors influencing CFW behaviour, such as a busy lifestyle and the use of a serving spoon (particularly for Thai participants).

5.8 Acknowledgements

This project was partially funded by the University of Reading Graduate School Travel Support Scheme. We would like to thank Agnese Rondoni, Erin Wallace, Mingpieng-or Pinpart (P'Ploy), Payuda Harnsoongnern (Kungwan), Atikrit Chanjavanakul (Doam) for facilitating the focus group discussion sessions. We would like to thank our sponsors, Bolan Thai restaurant in Reading, UK and Loving Hut, Rama III, Bangkok.

Chapter 6
General Discussion and Conclusion

6.1 General discussion

The aim of the current research was to investigate and discover CFW behaviour in a meal setting in the UK and Thailand. First, with respect to the first research question of this thesis, it was found that CFW behaviour is complex and influenced by many interconnecting factors, as also found in Quested et al. (2011) and Roodhuyzen et al. (2017). Second, in response to objectives one and two, for the UK, place and cost are significant factors. British consumers would be more likely to save leftover food when eating at home and when the food is more expensive. For Thailand, only the cost of food is the most important factor and has a positive relationship with the likelihood of leftover food being saved. These results are consistent with Ellison and Lusk (2018). In other words, the place of dining seems to be a key driver specifically for British consumers, but it is not important for Thai consumers when making decisions to save or not to save leftovers. In terms of the UK current policies, FW bins have already been provided by several local governments hoping to reduce FW at the household level emphasising the environmental impacts of FW (Cheshire East Council, n.d.), they could, therefore, emphasise more about the cost of food being wasted. In Thailand, there has been a lack of attentions in the FW problem from various stakeholders (Dow, 2015; Mungkung and Busch, 2017; Tesco PLC, 2020). We argue that governments, researchers, business sectors should now put CFW reduction in their agendas and the problem should not be overlooked particularly in dining situations. The government bodies or campaigners could also start from restaurants that provide not expensive meals.

As shown in the quantitative analysis, eating out habits, British consumers would be less likely to take leftovers home when compared with Thai consumers. For the British consumers, in-depth data from the FGD study show two key reasons elicited which support the significance of the place of dining are “social stigma” and “inconvenience” when dining out in a restaurant. In line with previous studies (Sirieix et al., 2017; Mirosa, Liu, et al., 2018; Hamerman et al., 2018), asking for a doggy bag to take leftovers away could be embarrassing and inconvenient. Participants said that it might not be suitable to carry a bag of leftover food around when not going straight home after a meal out. Some British consumers are embarrassed or not confident enough to

reclaim the leftover food in a restaurant; this is not the case for Thai consumers. The social stigma is stronger when the amount of food left is little because of feeling self-conscious about being “cheap”, in accordance with Wang et al. (2016). This in-depth information also supplements the quantitative findings about the interaction between the commensality and the amount of leftovers. British consumers are less likely to claim the leftovers when it is half a portion and when they are with other people. Results from Hamerman et al. (2018) revealed that restaurant diners would be more comfortable to take leftover food if they are with someone whom they do not have to impress (e.g., family members or friends). This means it might depend on the relationship types of those people with the consumers or types of social dining situations (Aschemann-Witzel et al., 2019). Regarding the likelihood of having CFW, our findings also show consistency with the outcomes from Uruguay consumers in Aschemann-Witzel et al. (2019); when eating alone British people would less likely to have leftover food because they would be able to control the amount of food better than the situations involving other people. Restaurants could follow instructions provided by WRAP to offer diners with more than one portion size and some dish could be served as a side dish rather than a larger portion to avoid having leftovers (WRAP, 2017c).

Third, although place is a significant factor for only the British group, our FGD project shed light on the fact that that both British and Thai consumers tend to save food when eating at home and home-cooked food. Lusk and Ellison (2017) found that consumers are more likely to save food at home than at a restaurant because of the higher cost in home-cooked food preparation (i.e., cost of ingredients and cost of time spent on cooking). Other studies (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015; Ponis et al., 2017) also found that those who cook their own meals would be less likely to waste food. This result may be explained by the fact that consumers are aware of how difficult food is to produce (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015) and they save food in order to save their future cooking time (Ellison and Lusk, 2018) which is considered as an opportunity cost (Becker, 1965; Scholderer and Grunert, 2005).

Our findings show a similar pattern, but we add more reasons for this behaviour. Our empirical descriptive results shed light on normative attitudes and food safety issues. In our current study, in addition to the “social stigma” and “inconvenience” particularly among British consumers, there is a lower level of trust in restaurant food when compared with food prepared at home. For example, some British consumers

perceived that there was more risk involved in saving leftover food from a restaurant to eat later due to less trust in ingredients used and in how hygienic the cooking process has been. By contrast, Trepka et al. (2006) found that the main food safety concern is to do with poor food handling practices by consumers at home. Therefore, there should be less concern about how the food is cooked at a restaurant but more about how consumers are going to reuse or reheat the leftovers. For Thai consumers, the quantitative analysis shows that the interaction between the place of dining and the presence of other people is significant. The food left over when consumers are dining out with others in a restaurant has the least possibility of being saved. Thai participants in our FGDs elicited their main reason to be about the food being shared among people at the same table and therefore linked with food safety concerns if food is going to be eaten again, particularly when a serving spoon is not used. Therefore, Thai consumers are aware about the risks from Thai dining culture (i.e., food is served in the middle of the table to be shared). Our findings of risk perception as a disease-preventive behaviour confirm the results from Deon et al. (2014) and Andrews et al. (2018). Not only consumers who are less likely to save leftover food, but Mirosa, Liu, et al. (2018) found that some restaurants in New Zealand would also discourage consumers from taking leftover food away due to the health and safety reasons associated with not reheating food properly which is conflicting with the Love Food Hate Waste campaign the New Zealand government has been trying to promote (Mirosa, Mainvil, et al., 2018; Love Food Hate Waste NZ, 2020). Our FGD participants from the UK have also experienced this discouragement from the restaurant staff.

Fourth, Chapter 3 indicates that FSPs in Thailand would find it appropriate and usual for diners to ask to take leftover food away. FGD results from Chapter 5 also suggested that Thai consumers were more active in saving leftover food in a restaurant setting than British consumers. Thai consumers not only frequently save the food for their own consumption, they also give it to other people (e.g., their family members, co-workers, or their cleaners) to show care and gratitude. Moreover, Thai people, particularly women who live with their extended family, would be willing to take any leftovers home. One possible explanation can be found in Farr-Wharton et al. (2014) and Porpino et al. (2015); women in a family would want to be a good food provider who take care of the family members. However, the behaviour of Thai consumers giving food to someone else apart from themselves or their people at home was found less in western and high-income countries (Sirieix et al., 2017; Mirosa, Liu, et al., 2018), but is shown more in lower-income countries such as Indonesia (Soma, 2017). One explanation

may be because of different cultures. The impact of family members reveals a close-knit relationship and seniority within the extended family for Thai society (Hofstede et al., 2010; Kakay, 2016). This element shows collectivist quality and could be different in other types of community such as the UK which could be more individualist (Hofstede et al., 2010). Fonseca (2013) categorised their Portuguese respondents who had the habits of giving away leftover food to others or to their pets as “food waste citizens” and described people who reused the leftovers as “non-food-waste” consumers. However, we argued that giving away leftover food is not wasting food because the food can still be used by other people.

Fifth, one distinctive similarity between British and Thai consumers is that the price of food plays a significant role in their decision to save food. Results from the qualitative study shows that the price of food would encourage consumers not to waste food. The more expensive the meal, the higher the motivation for consumers to save the food. This is in line with Delley and Brunner (2017), Mirosa, Liu, et al. (2018), Hamilton and Richards (2019) and Soma (2019). Consumers in the current research gave reasons based on their socioeconomic background. Those who are from a lower-income group or have been living more frugally are quite sensitive to food price. Previous studies found that money saving is the key benefit from saving leftover food from the consumers’ point of view (Qi and Roe, 2016; Delley and Brunner, 2017). Therefore, it is possible that consumers see more benefits from saving expensive food when compared with cheaper food, which confirms the findings in Landry and Smith (2019); CFW behaviour is responsive to food price. The focus of CFW reduction therefore needs to be on a cheaper meal situation in which leftover food is significantly less likely to be saved. This might be because consumers have more income, particularly in emerging economies where food is cheaper (Stuart, 2009). Therefore, consumers can bear the cost of food and care less about wasting it particularly when it is lower than the opportunity cost to reheat that food when compared with buying a freshly prepared meal (Tokareva and Eglite, 2014; Lusk and Ellison, 2017; Ellison and Lusk, 2018; Mirosa, Liu, et al., 2018; Landry and Smith, 2019).

Sixth, while the amount of leftover food is significant for American consumers in Ellison and Lusk (2018), this factor is not significant for both British and Thai consumers from the quantitative study. However, consumers from both countries emphasised during the FGDs that they are more likely to take the food home if the amount is large “enough to pack” or “enough to reuse”. These in-depth data support the findings in the statistical

analysis and consistent with Mirosa, Liu, et al. (2018). Additionally, in the Thailand dining-out context, this CFW behaviour also complies with FSPs' expectations found in the in-depth interview, who are hesitant to provide a take-away container if only a small portion of food is left. This has not been highlighted by policy makers in Thailand or in the UK yet but this will shed light on an impediment to a restaurant doggy bag policy (Quested, Ingle, et al., 2013; WRAP, 2017c). Some possible explanations for the small amount of leftover food not being saved might be because of the rising opportunity cost of cooking more food to make a full meal (Lusk and Ellison, 2017; Andrews et al., 2018; Ellison and Lusk, 2018) or a lack of awareness about FW problems and the availability of take-away containers (Mirosa, Liu, et al., 2018).

Seventh, future meal planning is also not seen to be a significant factor for both British and Thai consumers in the statistical analysis. Qualitative insight from FGDs show that it is because a meal plan is adjustable or rescheduled either by moving that plan to later or keeping leftover food for longer to maintain the plan. However, previous studies show food is wasted more if a meal is poorly planned (Graham-Rowe et al., 2014; Joerissen et al., 2015; Parfitt et al., 2010; Principato et al., 2015). Saving more leftover food might eventually interfere with the meal plan, resulting in more FW at home (Farr-Wharton et al., 2014). On the other hands, findings from the FGDs also show that some consumers do not usually plan their meals in advance, which complies with the findings in Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Jenny (2015) and Aschemann-Witzel, de Hooge, et al. (2018). Therefore, this factor is not important for CFW decisions in our study.

Results from qualitative studies in this thesis also show that CFW behaviour is driven by the intrinsic quality of food which is consistent with previous studies (Tokareva and Eglite, 2014; Joerissen et al., 2015; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Jenny, 2015; Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer, 2015; Richter and Bokelmann, 2017). Moreover, our empirical findings also show that internal factors from consumers such as feelings of guilt, physical conditions, and food preference also influence CFW behaviour and confirm findings in the literature (Block et al., 2016; Russell et al., 2017; Stefan et al., 2013; Qi and Roe, 2017; Ponis et al., 2017).

Enriched data from FGDs and evidence from demographic data from the quantitative study show that Thai people's CFW opinions and experience have a strong connection to religious and traditional beliefs disseminated about bad "karma" from wasting food

and how farmers have been working hard to produce food for us. This is also found in the in-depth interview with FSPs and in Soma (2017;2019). Thai government and FAO in Thailand were using this idea to encourage consumers in Bangkok to waste less food (Dow, 2015). By contrast, this theme did not emerge among British participants in the current study. Religions have gained little attention in the literature about its influence on CFW behaviour while one of the widespread Christian teachings is:

> *"When they were full, he told his disciples, "Collect the leftovers so that nothing is wasted.",* said St. John the Apostle in Christian tradition (Bible Hub, n.d.).

According to the 2011 Census in England and Wales, Christianity is still the largest religion (59.3%) (Office for National Statistics, 2012). The UK government has also been working with religious charities to redistribute food to people in need (WRAP, 2018b). It is surprising that none of the British consumers referred to a Christian belief like a participant in Sirieix et al. (2017) whose attitudes about not throwing food away stem from the Christian tradition: *"bread is a gift of God"*. This finding might be the result of a decline in the UK population of those who hold religious beliefs (Office for National Statistics, 2012). However, this traditional and religious beliefs of not wasting food may not be in line with the actual CFW behaviour. On the other hand, it highlights a gap between beliefs and CFW behaviour.

Similar to another study in the UK by Robinson and Hardman (2016), there is a strong connection between plate-clearing habits of British consumers and teachings from their immediate family members (i.e., parents). It is noticeable that some participants and participants' parents are from the "baby boom" generation[33]. Therefore, they are more likely to be frugal, to appreciate the value of food, to be careful about expenses, and more likely to value every part of what they eat (Lee and Huh, 2004; Severo et al., 2018). This awareness could be weaker in later generations, resulting in FW problems in the recent century (Mallinson et al., 2016; Robinson and Hardman, 2016).

Last, we also found that CFW behaviour at one point does not guarantee "zero waste" at the end of the stream. CFW behaviour to save leftover food might only shift CFW from one place to another, or the waste may only be delayed. Consistent with the literature (Farr-Wharton et al., 2014), consumers changed their initial plan, which is to consume leftover food, when there was an unexpected event such as going out to have

[33] Born between 1946 and 1964

meals with friends. Some consumers or their family members might not like consuming food that is kept for long time and would eventually throw it away (Fonseca, 2013; Porpino et al., 2015; Principato et al., 2015; McCarthy and Liu, 2017; Clark and Manning, 2018). Results from the quantitative analysis particularly among Thai respondents also show that some respondents do not want to eat food that has been kept for a long time because it is not fresh. Saved food could be inevitably wasted later on. Evidence to back up this argument can be found in Porpino et al. (2015) and Richter and Bokelmann (2017), who found that accumulating excessive food by consumers leads to having more FW in the end.

6.2 Limitations of the study

There are some limitations in this research which might restrict the generalisation of the results. First, only in-depth interviews in Thailand were conducted. This was at the stage of obtaining more information in the country due to a lack of data in the literature and from the government. Second, the sample sizes in the quantitative study are 208 for the UK and 209 for Thailand, which are relatively small and not representative for both countries. For the UK group, this research focused on people who have British citizenship and are living in the UK. However, the UK is a diverse country in terms of the ethnicity groups of residents and it has a high number of immigrants each year. Therefore, these people can also influence the CFW behaviour of people in the UK. Other subsequent studies could examine the CFW behaviour of UK people based on how long they have been living in the UK. Third, the survey was based on an online platform. Therefore, only those participants with better access to the internet took part. Fourth, the in-depth interview and FGD studies are qualitative and were conducted with a small number of participants. Therefore, the findings are not representative of the larger population. Fifth, our study is hypothetical, and we did not observe the actual behaviour in a real-world situation. Last, we considered a few factors affecting CFW behaviour. There may be more factors that could be significant, such as the intrinsic quality of food.

6.3 Practical implication for policy makers and stakeholders

The findings of this research shed light on CFW behaviour in a meal setting. Policymakers could utilise these findings in order to make decisions about CFW reduction campaigns particularly when adopting practices from another country. This

is because of certain significant factors, what consumers are concerned about varies between countries, and globalisation that changes consumption patterns over time.

First, although price reduction was a recommended approach for FW reduction in a retail setting (Rohm et al., 2017) as we can see from France, Italy, and in the UK (Mourad, 2015; Quinn, 2015; Roodhuyzen et al., 2017; de Hooge et al., 2017), it may not be an ideal method for the food catering service industry to use. As shown in the present study, food in a meal setting is likely to be wasted and leftover food is not likely to be saved when the price is low. The discount price would only shift FW from a restaurant shop-floor to customers' tables. However, UK buffet restaurants could implement a leftover penalty as carried out in Thailand to stop diners from over-serving or over-ordering food.

Findings in Zuraikat et al. (2018) show that advertising the availability of a take away container in a restaurant could reduce the level of food intake when compared with a situation when there is no advertisement about this service in a restaurant. Therefore, there would be more food left in the former situation. On the other hand, according to Mirosa, Liu, et al. (2018) and Hamerman et al. (2018), consumers would feel more encouraged and be more confident to ask for a doggy bag if restaurant staff verbally and actively offer this service to diners after meal. A policy in the UK mentions about restaurant staff could encourage diners to takeaway leftover (WRAP, 2017c). Campaigners could exploit the fact that consumers are willing to comply with social norms about not wasting food (Stefan et al., 2013; Stancu et al., 2016; Shimmura and Takenaka, 2010). Our descriptive statistic findings about normative attitudes also show that both British and Thai respondents would feel guilty if they waste food and would be likely to disapprove food wasting behaviour. Therefore, to reduce plate waste in a restaurant or in a café, there should be a clear message that taking leftover food away is normal, they would be doing the "right" thing to save the leftovers, and a leftover packing service is available. Restaurant staff should be able to adopt this practice in their routine and ask diners if they want to take the remaining food with them after they finish their meal.

Moreover, Deon et al. (2014) pointed out that there have been increasing concerns about foodborne diseases at the household level due to a lack of good food handling practice. Some consumers are not aware that the risk of foodborne illness could come from their own food handling behaviour at home (Trepka et al., 2006). Our findings also show that food safety is one of the main concerns for consumers when saving leftover

food at a restaurant. Therefore, restaurants could also inform diners about how food is prepared at their place and provide information about how to manage (i.e., reheat or reuse) the leftover food to avoid any food safety related incidents such as foodborne diseases. It could also be the responsibility of the government in each country to educate consumers about food handling practices particularly in Thailand where the problems of FW have been less recognised. A similar project has been conducted in the US called “Four Day Throw Away” (James et al., 2013). However, in addition to providing information about the shelf-life of the leftovers, more details could be added to this type of campaign such as leftover food handling practices (e.g., the best temperature and time for reheating leftover food) (Farr-Wharton et al., 2014; Joerissen et al., 2015).

In Thailand, food-saving campaigners could use group benefits and religious beliefs as key messages. Their campaign promotion could emphasise compassion for others, such as the farmers and those who cook for them. Strong beliefs about “karma” among Thai consumers also suggest that positive consequences or “good karma” could be a key message for the campaign in Thailand to prevent CFW behaviour. Buddhist activities have already involved the practice of giving a food offering from people to monks. This food sharing could expand further to reduce CFW. Campaign leaders in Thailand are also recommended to involve religious bodies and could look at similar FW reduction activities such as the Food Bank in the UK.

In a restaurant meal setting, we found that FSPs might be discouraged to pack up a leftover meal for their customers due to the cost imposed on them. However, there is a lower level of social stigma among Thai consumers when compared with British consumers. The results from the FGDs also suggest that Thai consumers are not embarrassed to take the leftovers away. Therefore, campaigns in Thailand could encourage customers to bring their own containers and pack up the food when needed, to avoid having FW in an eating-out scenario. This campaign could imitate the idea of “no plastic bag” in a shop. Moreover, since food cost is a significant factor for CFW decision and cheaper food is less likely saved, restaurants could use a meal discount as a strategy to encourage their customers to take leftover food away, particularly when the meal is not expensive, but consumers could bring their own container to pack up the leftover food. In addition, for the UK, changing the name of take-away containers from “a doggy bag” to something else to communicate CFW reduction practice as a behaviour of “saving money” and “escaping the feeling guilty of wasting food” would

be useful and might encourage leftover food saving behaviour. For both the UK and Thailand, government bodies could also encourage saving leftover food practice by raising the benefit of cost saving when compared with the cost of food. In addition, from business perspectives as mentioned in Shimmura and Takenaka (2010), food caterers might be more flexible and allow diners customise their portion sizes such as in addition to just serving normal and “kids menu”, there could be an option for “not so hungry menu”, or “meal by grams” charging people based on the amount they want to eat.

The mass communication sector in Thailand has more areas to get involved in the campaign to raise awareness of saving food. Previous studies show that media both online (e.g., websites, social media, and mobile applications) and via more traditional channels (e.g., TV, leaflets, and newspapers) as well as by word of mouth are effective ways to disseminate information about CFW reduction (Principato et al., 2015; Tucker and Farrelly, 2016; Qi and Roe, 2016). More specifically for the food catering sector in both UK and Thailand, the government could ask for greater collaboration between hotel chains and restaurant associations to be an active leader in communicating about CFW reduction direction and set a key performance index (e.g., quantity of leftover foods caused by diners) so that progress can be measured.

6.4 Future research

First, future research should consider other contextual factors affecting consumer decisions to save or to waste food during dining situations particularly in the food service sector. This might include conducting a study in a real-life dining situation, such as by observing diners in restaurants, particularly in an all-you-can-eat type of dining place. In addition, situations could be varied according to the intrinsic quality of the food at a meal, such as how the food is served in different styles of banquets (e.g., buffet style with self-serving or all-you-can-eat but ordering from restaurant staff). Moreover, the contextual factors could also relate to the relationship types of people in a dining situation. Second, a future study could conduct longitudinal studies to investigate CFW behaviour over time and consider different seasons. Third, an investigation into misperceptions about the “doggy bag” between FSPs and consumers’ views is recommended to be carried out. Fourth, from our findings, we found that consumers are hesitant about saving restaurant food, and one reason for this could be a lack of confidence in consuming leftover food which was not cooked at home. Instead of different cultures, future research could shed light into risk averse

personalities. To be able to measure culture and food consumption, there is an opportunity for further research to develop a cultural personality scale that takes into account behaviour in terms of cuisine, dining experience, and norms in food consumption. Another reason is about inconvenience to carry the leftover food if not going home straightaway after meal. Therefore, there is a need to investigate about restaurant density, distance to resident areas, and mode of transport people normally use when going to eat out to reveal more about the “convenient” and “inconvenient” situations. Fifth, further research could investigate behavioural change strategies. This could be done by different campaign messages based on factors affecting CFW decisions. Sixth, future studies could investigate the CFW behaviour of consumers offline or those who might have limited access to the internet, such as by comparing consumers who live in rural and urban areas or consumers within different ethnic groups. Last, other studies could gain further understanding about the likelihood of consumers eating leftover food or food that has been kept for a long time.

6.5 Conclusion

The current chapter drew results from the three empirical studies together and attempted to contribute to the on-going conversation in the existing literature. It hoped to present another step in the study of CFW behaviour by making a comparison between developed (the UK) and developing countries (Thailand). Particularly for Thailand, the thesis strongly hopes to add empirical evidence showing some similarity and outstanding points when compared with studies carried out in western countries. CFW behaviour in the context of saving leftover food is complex and confirms the conceptual framework of interconnected factors which should not rely on one study area. The current research provides insights into drivers that affect the CFW behaviour of people from the UK and Thailand. The place of dining and cost of food have a significant effect on British people’s decisions to save leftover food, whereas it is only the cost that has a positive effect on Thai people’s decisions. At a national level, the study recommends practical ways which stakeholders could apply in order to reduce FW, by making it normal to ask to take away leftover food in the UK, and by involving religious bodies in the campaign for Thailand. There is a scope for future research to contribute to the literature in the area of longitudinal study and taking festive seasons into consideration.

6.6 Transparency

The questionnaire and other supplements are available in appendices while pre-registration for the quantitative study as presented in Chapter 4 is available in: https://aspredicted.org/blind.php?x=n3e7rg.

References

Aamir, M., Ahmad, H., Javaid, Q. & Hasan, S. M. (2018). Waste Not, Want Not: A Case Study on Food Waste in Restaurants of Lahore, Pakistan. *Journal of Food Products Marketing,* **24**, 591-610.

Abeliotis, K., Lasaridi, K. & Chroni, C. (2014). Attitudes and Behaviour of Greek Households Regarding Food Waste Prevention. *Waste Management & Research,* **32**, 237-240.

Abeliotis, K., Lasaridi, K. & Chroni, C. (2016). Food Waste Prevention in Athens, Greece: The Effect of Family Characteristics. *Waste Management & Research,* **34**, 1210-1216.

Aguinis, H. & Bradley, K. J. (2014). Best Practice Recommendations for Designing and Implementing Experimental Vignette Methodology Studies. *Organizational Research Methods,* **17**, 351-371.

Ahamed, A., Yin, K., Ng, B. J. H., Ren, F., Chang, V. W. C. & Wang, J. Y. (2016). Life Cycle Assessment of the Present and Proposed Food Waste Management Technologies From Environmental and Economic Impact Perspectives. *Journal of Cleaner Production,* **131**, 607-614.

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes,* **50**, 179-211.

Alexander, C. S. & Becker, H. J. (1978). The Use of Vignettes in Survey Research. *The Public Opinion Quarterly,* **42**, 93-104.

Allen, M. (2017). *The SAGE Encyclopedia of Communication Research Methods.* SAGE Publications.

Almli, V. L., Gaarder, M. & Pettersen, M. K. (2018). Communicating Packaging Functionality for Food Waste Reduction Influence Consumer Choices. *21st IAPRI World Conference on Packaging*

Almli, V. L., MacDonald, G., Rohm, H., Aschemann-Witzel, J., Steenbekkers, B., Roodhuyzen, D., Normann, A. & Oostindjer, M. (2015). Qualitative Usage of Projective Mapping in Focus Groups. An Application on Food Waste in Five Countries. *11th Pangborn Sensory Science Symposium.* Gothenburg, Sweden.

Alvo, M. & Yu, P. L. H. (2014). *Statistical Methods for Ranking Data.* New York: Springer.

Andersson, M. (2015). *Comparison of the Rank-ordered Logit and Between-within Regression Models.* Masters, Stockholms University.

Andrews, L., Kerr, G., Pearson, D. & Mirosa, M. (2018). The Attributes of Leftovers and Higher-Order Personal Values. *British Food Journal,* **120**, 1965-1979.

APEC (2014). APEC Action Plan for Reducing Food Loss and Waste. China: Asia-Pacific Economic Cooperation.

Ariyapruchya, K., Reungsri, T., Habalian, R. A., Clarke, J. L. & Kuriakose, S. (2017). Thailand Economic Monitor: Digital Transformation. Bangkok: World Bank.

Armitage, C. J. & Conner, M. (2001). Efficacy of the Theory of Planned Behaviour: A Meta-Analytic Review. *British Journal of Social Psychology,* **40**, 471-499.

Arnould, E. J. & Wallendorf, M. (1994). Market-Oriented Ethnography: Interpretation Building and Marketing Strategy Formulation. *Journal of Marketing Research,* **31**, 484-504.

Arunrat, N. & Pumijumnong, N. (2017). Practices for Reducing Greenhouse Gas Emissions from Rice Production in Northeast Thailand. *Agriculture,* **7**, 4.

Aschemann-Witzel, J. (2018). Consumer Perception and Preference for Suboptimal Food under the Emerging Practice of Expiration Date Based Pricing in Supermarkets. *Food Quality And Preference,* **63**, 119-128.

Aschemann-Witzel, J., de Hooge, I. E., Almli, V. L. & Oostindjer, M. (2018). Fine-Tuning the Fight Against Food Waste. *Journal of Macromarketing,* **38**.
Aschemann-Witzel, J., de Hooge, I. E., Amani, P., Bech-Larsen, T. & Jenny, G. (2015). Consumers and Food Waste – A Review of Research Approaches and Findings on Point of Purchase and In-Household Consumer Behaviour. *Consumer Behavior in a Changing World: Food, Culture, Society.* Italy: Agricultural & Applied Economics Association.
Aschemann-Witzel, J., de Hooge, I. E., Amani, P., Bech-Larsen, T. & Oostindjer, M. (2015). Consumer-Related Food Waste: Causes and Potential for Action. *Sustainability,* **7**, 6457-6477.
Aschemann-Witzel, J., de Hooge, I. E., Rohm, H., Normann, A., Bossle, M. B., Grønhøj, A. & Oostindjer, M. (2017). Key Characteristics and Success Factors of Supply Chain Initiatives Tackling Consumer-Related Food Waste – A Multiple Case Study. *Journal of Cleaner Production,* **155, Part 2**, 33-45.
Aschemann-Witzel, J., Giménez, A. & Ares, G. (2018). Convenience or Price Orientation? Consumer Characteristics Influencing Food Waste Behaviour in the Context of an Emerging Country and the Impact on Future Sustainability of the Global Food Sector. *Global Environmental Change,* **49**, 85-94.
Aschemann-Witzel, J., Giménez, A., Grønhøj, A. & Ares, G. (2019). Avoiding Household Food Waste, One Step at a Time: The Role of Self-Efficacy, Convenience Orientation and The Good Provider Identity in Distinct Situational Contexts. *Journal of Consumer Affairs,* **https://doi.org/10.1111/joca.12291**.
Asioli, D., Aschemann-Witzel, J., Caputo, V., Vecchio, R., Annunziata, A., Naes, T. & Varela, P. (2017). Making Sense of The "Clean Label" Trends: A Review of Consumer Food Choice Behavior and Discussion of Industry Implications. *FOOD RESEARCH INTERNATIONAL,* **99**, 58-71.
Asioli, D., Canavari, M., Malaguti, L. & Mignani, C. (2016). Fruit Branding: Exploring Factors Affecting Adoption of the New Pear Cultivar 'Angelys' in Italian Large Retail. *International Journal of Fruit Science,* **16**, 284-300.
Asioli, D., Canavari, M., Pignatti, E., Obermowe, T., Sidali, K. L., Vogt, C. & Spiller, A. (2014). Sensory Experiences and Expectations of Italian and German Organic Consumers. *Journal of International Food & Agribusiness Marketing,* **26**, 13-27.
Asioli, D., Rocha, C., Wongprawmas, R., Popa, M., Gogus, F. & Almli, V. L. (2019). Microwave-Dried or Air-Dried? Consumers' Stated Preferences and Attitudes for Organic Dried Strawberries. A Multi-Country Investigation in Europe. *Food Research International,* **120**, 763-775.
Atkinson, W. & Deeming, C. (2015). Class and Cuisine in Contemporary Britain: the Social Space, the Space of Food and Their Homology. *The Sociological Review,* **63**, 876-896.
Atzmüller, C. & Steiner, P. M. (2010). Experimental Vignette Studies in Survey Research. *Methodology,* **6**, 128-138.
Auspurg, K. & Hinz, T. (2015). *Factorial Survey Experiments.* United States of America: SAGE Publications, Inc.
Bagozzi, R. P., Wong, N., Abe, S. & Bergami, M. (2000). Cultural and Situational Contingencies and the Theory of Reasoned Action: Application to Fast Food Restaurant Consumption. *Journal of Consumer Psychology,* **9**, 97-106.
Balcombe, K., Chalak, A. & Fraser, I. (2009). Model Selection for the Mixed Logit with Bayesian Estimation. *Journal of Environmental Economics and Management,* **57**, 226-237.
Baltar, F. & Brunet, I. (2012). Social Research 2.0: Virtual Snowball Sampling Method Using Facebook. *Internet Research,* **22**, 57-74.

Barge, S. & Gehlbach, H. (2012). Using the Theory of Satisficing to Evaluate the Quality of Survey Data. *Research in Higher Education,* **53**, 182-200.
Becker, G. S. (1965). A Theory of the Allocation of Time. *The Economic Journal,* **75**, 493-517.
Beggs, S., Cardell, S. & Hausman, J. (1981). Assessing the Potential Demand for Electric Cars. *Journal of Econometrics,* **17**, 1-19.
Bellemare, M. F., Çakir, M., Peterson, H. H., Novak, L. & Rudi, J. (2017). On the Measurement of Food Waste. *American Journal of Agricultural Economics,* **99**, 1148-1158.
Bender, A. (2012). *The World's Top 10 Cities for Street Food*. URL: https://www.forbes.com/sites/andrewbender/2012/09/19/the-worlds-top-10-cities-for-street-food/#1f8e25833897 [15 March 2018].
Benyam, A., Kinnear, S. & Rolfe, J. (2018). Integrating Community Perspectives into Domestic Food Waste Prevention and Diversion Policies. *Resources, Conservation & Recycling,* **134**, 174-183.
Beretta, C., Stoessel, F., Baier, U. & Hellweg, S. (2013). Quantifying Food Losses and the Potential for Reduction in Switzerland. *Waste Management,* **33**, 764-773.
Berg, B. L. & Lune, H. (2016). *Qualitative Research Methods for the Social Sciences* England: Pearson Education Limited.
BHA (2015). HaFS Agreement. UK: British Hospitality Association.
Bible Hub. (n.d.). *John 6:12*. URL: https://biblehub.com/john/6-12.htm [19 December 2019].
Bicchieri, C. (2017). *Norms in the Wild: How to Diagnose, Measure, and Change Social Norms.* USA: Oxford University Press.
Birisci, E. & McGarvey, R. G. (2018). Optimal Production Planning Utilizing Leftovers for an All-you-care-to-eat Food Service Operation. *Journal of Cleaner Production,* **171**, 984-994.
Block, L. G., Keller, P. A., Vallen, B., Williamson, S., Birau, M. M., Grinstein, A., Haws, K. L., LaBarge, M. C., Lamberton, C., Moore, E. S., Moscato, E. M., Reczek, R. W. & Tangar, A. H. (2016). The Squander Sequence: Understanding Food Waste at Each Stage of the Consumer Decision-making Process. *Journal of Public Policy & Marketing,* **35**, 292-304.
Böckenholt, U. (2001). Mixed-effects Analyses of Rank-ordered Data. *Psychometrika,* **66**, 45-62.
Bolderston, A. (2012). Conducting a Research Interview. *Journal of Medical Imaging and Radiation Sciences,* **43**, 66-76.
Boschini, M., Falasconi, L., Giordano, C. & Alboni, F. (2018). Food Waste in School Canteens: A Reference Methodology for Large-Scale Studies. *Journal of Cleaner Production*.
Bozzola, M., Dal Palù, D. & De Giorgi, C. (2017). Design for Leftovers. From Food Waste to Social Responsibility. *The Design Journal,* **20**, S1692-S1704.
Bradshaw, A. (2014). *Sia Dai Jung Sia Jai Duay Pasa Ungrid Wa Yang Rai (Thai langauge)*. URL: https://www.youtube.com/watch?v=ruG98YIQdkg [17 December 2019].
Braun, V. & Clarke, V. (2006). Using Thematic Analysis in Psychology. *Qualitative Research in Psychology,* **3**, 77-101.
Brennan, G., Eriksson, L., Goodin, R. E. & Southwood, N. (2013). *Explaining Norms.* The United States of America: Oxford University Press.
Brewer, M. B. & Gardner, W. (1996). Who is this "we"? Levels of Collective Identity and Self Representations. *Journal of Personality and Social Psychology,* **71**, 83-93.

Britz, W., Dudu, H. & Ferrari, E. (2014). Economy-wide Impacts of Food Waste Reduction: A General Equilibrium Approach. *Agri-Food and Rural Innovations for Healthier Societies.* Slovenia.

Brunso, K. & Grunert, K. G. (1995). Development and Testing of a Cross-culturally Valid Instrument: Food-related Life Style. *Advances in Consumer Research, Vol XXII,* **22**, 475-480.

BSR (2013). *Analysis of U.S. Food Waste Among Food Manufacturers, Retails, and Restaurants: Prepared for the Food Waste Reduction Alliance.* USA: Food Marketing Institute (FMI), Grocery Manufacturers Association (GMA), and National Restaurant Association (NRA).

Buckley, M., Cowan, C. & McCarthy, M. (2007). The Convenience Food Market in Great Britain: Convenience Food Lifestyle (CFL) Segments. *Appetite,* **49**, 600-617.

Burton, K., Serrano, E., Cox, H., Budowle, R. & Dulys-Nusbaum, E. (2016). Benefits, Barriers, and Challenges to University-Level Food Waste Tracking. *Journal of Hunger & Environmental Nutrition,* **11**, 428-438.

Buzby, J. C. & Hyman, J. (2012). Total and Per Capita Value of Food Loss in the United States. *Food Policy,* **37**, 561-570.

Buzby, J. C., Wells, H. F. & Bentley, J. (2013). ERS's Food Loss Data Help Inform the Food Waste Discussion. *Amber Waves*, 13.

Buzby, J. C., Wells, H. F. & Hyman, J. (2014a). The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States, EIB-121. U.S. Department of Agriculture, Economic Research Service.

Buzby, J. C., Wells, H. F. & Hyman, J. (2014b). The Estimated Amount, Value, and Calories of Postharvest Food Losses at the Retail and Consumer Levels in the United States, EIB-121. U.S. Department of Agriculture, Economic Research Service.

Cambridge Dictionary. (n.d.). *Doggy Bag*. URL: https://dictionary.cambridge.org/dictionary/english/doggy-bag [15 December 2019].

Canali, M., Amani, P., Aramyan, L., Gheoldus, M., Moates, G., Ostergren, K., Silvennoinen, K., Waldron, K. & Vittuari, M. (2017). Food Waste Drivers in Europe, from Identification to Possible Interventions. *Sustainability,* **9**, 37.

Canali, M., Östergren, K., Amani, P., Aramyan, L., Sijtsema, S., Korhonen, O., Silvennoinen, K., Moates, G., Waldron, K. & O'Connor, C. (2014). *Drivers of Current Food Waste Generation, Threats of Future Increase and Opportunities for Reduction.* Bologna: EU 7th Framework Program (Project Number: 311972).

Casson, M. (1997). *Culture, Social Norms, and Economics.* United Kingdom: Edward Elgar Publishing.

Castleberry, A. & Nolen, A. (2018). Thematic Analysis of Qualitative Research Data: Is It As Easy As It Sounds? *Currents in Pharmacy Teaching and Learning,* **10**, 807-815.

Chadwick, B., Gill, P., Stewart, K. & Treasure, E. (2008). Methods of Data Collection in Qualitative Research: Interviews and Focus Groups. *BDJ,* **204**, 291-295.

Chakona, G. & Shackleton, C. M. (2017). Local Setting Influences the Quantity of Household Food Waste in Mid-Sized South African Towns. *PLoS ONE,* **12**, e0189407.

Chapman, R. G. & Staelin, R. (1982). Exploiting Rank Ordered Choice Set Data within the Stochastic Utility Model. *Journal of Marketing Research,* **19**, 288-301.

Cheng, S. L., Olsen, W., Southerton, D. & Warde, A. (2007). The Changing Practice of Eating: Evidence From UK Time Diaries, 1975 and 2000. *The British Journal of Sociology,* **58**, 39-61.
Cheshire East Council. (n.d.). *Food Waste*. URL: https://www.cheshireeast.gov.uk/waste_and_recycling/bins/food-waste-collections.aspx [1 July 2020].
Chin, Y.-m. (2008). A Household Production Model of Demand For Childcare and Meals: Theory and Evidence From the Philippines. *Review of Economics of the Household,* **6**, 47-64.
Cialdini, R. B. & Goldstein, N. J. (2004). Social Influence: Compliance and Conformity. *Annual Review of Psychology,* **55**, 591-621.
Clark, J. & Manning, L. (2018). What are the Factors That an Opportunity Sample of UK Students Insinuate as Being Associated with Their Wastage of Food in the Home Setting? *Resources, Conservation and Recycling,* **130**, 20-30.
Cohen, D. A. & Story, M. (2014). Mitigating the Health Risks of Dining Out: The Need for Standardized Portion Sizes in Restaurants. *American Journal of Public Health,* **104**, 586-590.
Commonwealth of Australia (2017). National Food Waste Strategy: Halving Australia's Food Waste by 2030, Commonwealth of Australia 2017. Australia: Australian Government.
Connell, P. M., Finkelstein, S. R., Scott, M. L. & Vallen, B. (2016). Helping Lower Income Parents Reduce the Risk of Food Waste Resulting from Children's Aversion to Healthier Food Options: Comment on Daniel (2016). *Social Science & Medicine,* **150**, 286-289.
Daniel, C. (2016). Economic Constraints on Taste Formation and the True Cost of Healthy Eating. *Social Science & Medicine,* **148**, 34-41.
De Clercq, D., Wen, Z. & Fan, F. (2017). Performance evaluation of restaurant food waste and biowaste to biogas pilot projects in China and implications for national policy. *Journal of Environmental Management,* **189**, 115-124.
de Hooge, I. E., Oostindjer, M., Aschemann-Witzel, J., Normann, A., Loose, S. M. & Almli, V. L. (2017). This Apple is Too Ugly for Me!: Consumer Preferences for Suboptimal Food Products in the Supermarket and at Home. *Food Quality and Preference,* **56**, 80-92.
Dehlholm, C. (2014). Project Mapping and Napping. *In:* Varela, P. & Ares, G. (eds.) *Novel Techniques in Sensory Characterization and Consumer Profiling.* Florida: CRC Press.
Delley, M. & Brunner, T. A. (2017). Foodwaste within Swiss Households: A Segmentation of the Population and Suggestions for Preventive Measures. *Resources Conservation and Recycling,* **122**, 172-184.
Deon, B. C., Medeiros, L. B., Lúcia de Freitas Saccol, A., Hecktheuer, L. H., Saccol, S. & Naissinger, M. (2014). Good Food Preparation Practices in Households: A Review. *Trends in Food Science & Technology,* **39**, 40-46.
Di Noia, J. & Cullen, K. W. (2015). Fruit and Vegetable Attitudes, Norms, and Intake in Low-Income Youth. *Health Education & Behavior,* **42**, 775-782.
Diaz-Ruiz, R., Costa-Font, M. & Gil, J. M. (2018). Moving Ahead from Food-Related Behaviours: An Alternative Approach to Understand Household Food Waste Generation. *Journal of Cleaner Production,* **172**, 1140-1151.
DiCicco-Bloom, B. & Crabtree, B. F. (2006). The Qualitative Research Interview. *Medical Education,* **40**, 314-321.
Doran, R. & Larsen, S. (2016). The Relative Importance of Social and Personal Norms in Explaining Intentions to Choose Eco-Friendly Travel Options. *International Journal of Tourism Research,* **18**, 159-166.

Dow, A. (2015). *Thailand Launches National Save Food Campaign in Collaboration with FAO to Reduce Huge Amounts of Food Loss And Food Waste*. URL: http://www.fao.org/asiapacific/news/detail-events/en/c/288212/ [15 December 2019].
Dung, T. N. B., Sen, B., Chen, C.-C., Kumar, G. & Lin, C.-Y. (2014). Food Waste to Bioenergy via Anaerobic Processes. *Energy Procedia,* **61**, 307-312.
Edirisingha, P. A., Abarashi, J., Ferguson, S. & Aitken, R. (2017). From "Participant" to "Friend": The Role of Facebook Engagement in Ethnographic Research. *Qualitative Market Research,* **20**, 416.
Edirisingha, P. A., Ferguson, S. & Aitken, R. (2015). From 'Me' to 'We': Negotiating New Family Identity Through Meal Consumption in Asian Cultures. *Qualitative Market Research,* **18**, 477-496.
Ellison, B. & Lusk, J. L. (2016). Examining Household Food Waste Decisions: A Vignette Approach. *2016 Agricultural and Applied Economics Association Annual Meeting*.
Ellison, B. & Lusk, J. L. (2018). Examining Household Food Waste Decisions: A Vignette Approach. *Applied Economic Perspectives and Policy,* **40**, 613-631.
Elshiewy, O., Zenetti, G. & Boztug, Y. (2017). Differences Between Classical and Bayesian Estimates for Mixed Logit Models: A Replication Study. *Journal of Applied Econometrics,* **32**, 470-476.
Elster, J. (1989). Social Norms and Economic Theory. *The Journal of Economic Perspectives,* **3**, 99-117.
Eriksson, M., Strid, I. & Hansson, P.-A. (2015). Carbon Footprint of Food Waste Management Options in the Waste Hierarchy – A Swedish Case Study. *Journal of Cleaner Production,* **93**, 115-125.
EU FUSIONS. (2016). *About FUSIONS* URL: http://www.eu-fusions.org/ [1 July 2015].
Euromonitor International (2018). Consumer Foodservice in Thailand. Retrieved from Passport.
European Union (2008). *Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on Waste and Repealing Certain Directives.* Official Journal of the European Union.
Falcon, J., Gray, S. & Virtue, N. (2008). Final Report: Love Food Champions. WRAP.
FAO (2011). *Global Food Losses and Food Waste: Extent, Causes and Prevention.* Rome: FAO.
FAO. (2012). *Save Food: Global Initiative on Food Loss and Waste Reduction*. URL: http://www.fao.org/save-food/en/ [25 February 2018].
FAO (2013). *Food Wastage Footprint: Impacts on Natural Resources.* Natural Resources Management and Environment Department: FAO.
FAO (2014a). Definitional Framework of Food Loss. Rome: Save Food: Global Initiative on Food Loss and Waste Reduction.
FAO (2014b). *High-Level Multi-Stakeholder Consultation on Food Losses and Food Waste in Asia and the Pacific Region.* Bangkok: Save Food Asia-Pacific Campaign.
FAO (2015a). Global Initiative on Food Loss and Waste Reduction. The UK.
FAO. (2015b). *The State of Food Insecurity in the World 2015*. URL: http://www.fao.org/hunger/en/ [3 June 2015].
FAO (2019). The State of Food and Agriculture 2019. Moving Forward on Food Loss and Waste Reduction. Rome: Licence: CC BY-NC-SA 3.0 IGO.
Farr-Wharton, G., Foth, M. & Choi, J. H. (2014). Identifying Factors that Promote Consumer Behaviours Causing Expired Domestic Food Waste. *Journal of Consumer Behaviour,* **13**, 393-402.

Filimonau, V., Fidan, H., Alexieva, I., Dragoev, S. & Marinova, D. D. (2019). Restaurant Food Waste and the Determinants of Its Effective Management in Bulgaria: An Exploratory Case Study of Restaurants in Plovdiv. *Tourism Management Perspectives,* **32**, 100577.

Fishbein & Ajzen (1975). *Belief, Attitude, Intention, and Behaviour: An Introduction to Theory and Research.* Canada: Addison-Wesley Publishing Company, Inc.

Fonseca, J. R. S. (2013). A Latent Class Model to discover Household Food Waste Patterns in Lisbon City in Support of Food Security, Public Health and Environmental Protection. *International Journal on Food System Dynamics,* **4**, 184-197.

Food Safety and Inspection Service. (2016). *Food Product Dating*. URL: https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/food-labeling/food-product-dating/food-product-dating [06 April 2018].

Furst, T., Connors, M., Bisogni, C. A., Sobal, J. & Falk, L. W. (1996). Food Choice: A Conceptual Model of the Process. *Appetite,* **26**, 247-266.

Gambardello, J. A. (2013). Uncertain Origins of American Doggy Bag. *McClatchy - Tribune Business News U6* p.Newspaper Article.

Georgantzis, N., Vasileiou, E. & Kotzaivazoglou, I. (2017). Peer Norm Guesses and Self-reported Attitudes Towards Performance-related Pay. *PLoS One,* **12**.

Ghinea, C., Ghinea, C., Ghiuta, O. A. & Ghiuta, O. A. (2019). Household Food Waste Generation: Young Consumers Behaviour, Habits and Attitudes. *International Journal of Environmental Science and Technology,* **16**, 2185-2200.

Gile, K. J., Beaudry, I. S., Handcock, M. S. & Ott, M. Q. (2018). Methods for Inference from Respondent-Driven Sampling Data. *Annual Review of Statistics and Its Application,* **5**, 65-93.

GIZ. (2018). *Nak Wi Jai Ruam Prak Dun Nayobai Lod Boriman Aharn Luey Ting Lae Kaya Aharn Nai Thai (Thai language)*. URL: https://www.thai-german-cooperation.info/th/researchers-support-shaping-thailands-policy-on-food-loss-and-waste/ [3 July 2020].

Glaser, B. G. & Strauss, A. L. (1968). *The Discovery of Grounded Theory : Strategies for Qualitative Research.* London: Weidenfeld and Nicolson.

Government Office for Science (2017). Food Waste: A Response to the Policy Challenge. London.

Graham-Rowe, E., Jessop, D. C. & Sparks, P. (2014). Identifying Motivations and Barriers to Minimising Household Food Waste. *Resources Conservation and Recycling,* **84**, 15-23.

Graham-Rowe, E., Jessop, D. C. & Sparks, P. (2015). Predicting Household Food Waste Reduction Using an Extended Theory of Planned Behaviour. *Resources, Conservation and Recycling,* **101**, 194-202.

Graham, M. E. & Cable, D. M. (2001). Consideration of the Incomplete Block Design for Policy-Capturing Research. *Organizational Research Methods,* **4**, 26-45.

Grasso, S., Omoarukhe, E., Wen, X., Papoutsis, K. & Methven, L. (2019). The Use of Upcycled Defatted Sunflower Seed Flour as a Functional Ingredient in Biscuits. *Foods (Basel, Switzerland),* **8**, 305.

Grunert, K. G. (2005). Food Quality and Safety: Consumer Perception and Demand. *European Review of Agricultural Economics,* **32**, 369-391.

Grunert, K. G., Brunsø, K. & Bisp, S. (1993). Food-related lifestyle: Development of a Cross-culturally Valid Instrument for Market Surveillance. *MAPP Working Paper No. 12.* Denmark: Aarhus School of Business.

Hainmueller, J., Hangartner, D. & Yamamoto, T. (2015). Validating Vignette and Conjoint Survey Experiments Against Real-world Behavior. *Proceedings of the National Academy of Sciences,* **112**, 2395-2400.
Hall, K. D., Guo, J., Dore, M. & Chow, C. C. (2009). The Progressive Increase of Food Waste in America and Its Environmental Impact. *PLOS ONE,* **4**, e7940.
Hamamura, T. (2011). Are Cultures Becoming Individualistic? A Cross-Temporal Comparison of Individualism–Collectivism in the United States and Japan. *Personality and social psychology review,* **16**, 3-24.
Hamerman, E. J., Rudell, F. & Martins, C. M. (2018). Factors that Predict Taking Restaurant Leftovers: Strategies for Reducing Food Waste. *Journal of Consumer Behaviour,* **17**, 94-104.
Hamilton, S. F. & Richards, T. J. (2019). Food Policy and Household Food Waste. *American Journal of Agricultural Economics,* **101**, 600-614.
Harris, J. E., Gleason, P., Sheean, P., Boushey, C., Beto, J. A. & Bruemmer, B. (2009). An Introduction to Qualitative Research for Food and Nutrition Professionals. *Journal of the American Dietetic Association,* **109**, 80-90.
Harvey, W. S. (2011). Strategies for Conducting Elite Interviews. *Qualitative Research,* **11**, 431-441.
Hebrok, M. & Boks, C. (2017). Household Food Waste: Drivers and Potential Intervention Points for Design – An Extensive Review. *Journal of Cleaner Production,* **151**, 380-392.
Hechter, M. & Opp, K.-D. (2001). *Social Norms.* New York: Russel Sage Foundation.
Heikkilä, L., Reinikainen, A., Katajajuuri, J.-M., Silvennoinen, K. & Hartikainen, H. (2016). Elements Affecting Food Waste in the Food Service Sector. *Waste Management,* **56**, 446-453.
Hemar-Nicolas, V., Ezan, P., Gollety, M., Guichard, N. & Leroy, J. (2013). How Do Children Learn Eating Practices? Beyond the Nutritional Information, the Importance of Social Eating. *Young Consumers,* **14**, 5-18.
Hensher, D. A. & Greene, W. H. (2003). The Mixed Logit Model: The State of Practice. *Transportation,* **30**, 133-176.
Hensher, D. A., Rose, J. M. & Greene, W. H. (2015). *Applied Choice Analysis.* Cambridge: Cambridge University Press.
HM Government (2018). Our Waste, Our Resources: A Strategy for England. UK.
Hodges, R. J., Buzby, J. C. & Bennett, B. (2011). Postharvest Losses and Waste in Developed and Less Developed Countries: Opportunities to Improve Resource Use. *Journal of Agriculture Science,* **149**, 37-45.
Hoek, A. C., Luning, P. A., Stafleu, A. & de Graaf, C. (2004). Food-related Lifestyle and Health Attitudes of Dutch Vegetarians, Non-vegetarian Consumers of Meat Substitutes, and Meat Consumers. *Appetite,* **42**, 265-272.
Hoffman, J. I. E. (2019). Chapter 25 - Analysis of Variance. I. One-Way. *In:* Hoffman, J. I. E. (ed.) *Basic Biostatistics for Medical and Biomedical Practitioners (Second Edition).* Academic Press.
Hofstede, G., Hofstede, G. J. & Minkov, M. (2010). *Cultures and Organizations: Software and the Mind.* The United States of America: McGraw-Hill.
Holloway, I. & Galvin, K. (2016). *Qualitative Research in Nursing and Healthcare.* Hoboken, United Kingdom: John Wiley & Sons, Incorporated.
Holman, E. S., Harbour, C. K., Azevedo Said, R. V. & Figueroa, M. E. (2016). Regarding Realities: Using Photo-based Projective Techniques to Elicit Normative and Alternative Discourses on Gender, Relationships, and Sexuality in Mozambique. *Global Public Health,* **11**, 719.

Hopfer, H. & Heymann, H. (2013). A Summary of Projective Mapping Observations – The Effect of Replicates and Shape, and Individual Performance Measurements. *Food Quality and Preference,* **28**, 164-181.
Huber, J. & Train, K. (2001). On the Similarity of Classical and Bayesian Estimates of Individual Mean Partworths. *Marketing Letters,* **12**, 259-269.
Iacovidou, E., Ohandja, D.-G. & Voulvoulis, N. (2012). Food waste disposal units in UK households: The need for policy intervention. *Science of The Total Environment,* **423**, 1-7.
Ingram, J., Ericksen, P. & Liverman, D. (2010). *Food Security and Global Environmental Change.* London: Earthscan.
Iriondo-DeHond, M., Miguel, E. & Del Castillo, M. D. (2018). Food Byproducts as Sustainable Ingredients for Innovative and Healthy Dairy Foods. *Nutrients,* **10**, 1358.
Ishangulyyev, R., Kim, S. & Lee, S. H. (2019). Understanding Food Loss and Waste-Why Are We Losing and Wasting Food? *Foods (Basel, Switzerland),* **8**, 297.
James, K. J., Albrecht, J. A., Litchfield, R. E. & Weishaar, C. A. (2013). A Summative Evaluation of a Food Safety Social Marketing Campaign “4-Day Throw-Away” Using Traditional and Social Media. *Journal of Food Science Education,* **12**, 48-55.
Janssen, A. M., Vries, M. A. N.-d., Boer, E. P. J. & Kremer, S. (2017). Fresh, Frozen, or Ambient Food Equivalents and Their Impact on Food Waste Generation in Dutch Households. *Waste Management,* **67**, 298-307.
Jensen, J. D. & Teuber, R. (2018). Food Waste Prevention: State of the Art in Impact Assessment and Empirical Evidence for Denmark. Copenhagen: University of Copenhagen.
Joerissen, J., Priefer, C. & Braeutigam, K.-R. (2015). Food Waste Generation at Household Level: Results of a Survey among Employees of Two European Research Centers in Italy and Germany. *Sustainability,* **7**, 2695-2715.
Johnson, J. M. (2001). In-depth Interviewing. *In:* Gubrium, J. F. & Holstein, J. A. (eds.) *Handbook of Interview Research: Context & Method.* USA: Sage Publications, Inc.
Jones, S. C., Magee, C. & Andrews, K. (2015). ‘I Think Other Parents Might. …’: Using a Projective Technique to Explore Parental Supply of Alcohol. *Drug and Alcohol Review,* **34**, 531-539.
Just, D. R. & Wansink, B. (2011). The Flat-Rate Pricing Paradox: Conflicting Effects of "All-You-Can-Eat" Buffet Pricing. *The Review of Economics and Statistics,* **93**, 193-200.
Kakay, S. (2016). *The Effect of Collectivism on Family Meal Consumption Behaviour and Its Implications on Food Companies in Sierra Leone.* College of Business and Law Doctoral Thesis, University of Salford.
Katajajuuri, J.-M., Silvennoinen, K., Hartikainen, H., Heikkilä, L. & Reinikainen, A. (2014). Food waste in the Finnish food chain. *Journal of Cleaner Production,* **73**, 322-329.
Khongtong, J., Karim, S. A., Othman, M. & Bolong, J. (2014). Consumption Pattern and Consumers' Opinion Toward Street Food in Nakhon Si Thammarat Province, Thailand. *International Food Research Journal,* **21**, 125.
Knight, C., Stanley, R. & Jones, L. (2002). *Agriculture in the Food Supply Chain: An Overview.* UK: Campden & Chorleywood Food Research Association Group.
Koester, U. (2014). Food Loss and Waste as an Economic and Policy Problem. *Intereconomics,* **49**, 348-354.
Koivupuro, H. K., Hartikainen, H., Silvennoinen, K., Katajajuuri, J. M., Heikintalo, N., Reinikainen, A. & Jalkanen, L. (2012). Influence of Socio-Demographical,

Behavioural and Attitudinal Factors on the Amount of Avoidable Food Waste Generated in Finnish Households. *International Journal of Consumer Studies,* **36**, 183-191.
Koop, G. & Poirier, D. J. (1994). Rank-Ordered Logit Models: An Empirical Analysis of Ontario Voter Preferences. *Journal of Applied Econometrics,* **9**, 369-388.
Köster, E. P. (2009). Diversity in the Determinants of Food Choice: A Psychological Perspective. *Food Quality and Preference,* **20**, 70-82.
Kranert, M., Hafner, G., Barabosz, J., Schneider, F., Lebersorger, S., Scherhaufer, S., Schuller, H. & Leverenz, D. (2012). *Determination of Discarded Food and Proposals for a Minimization of Food Wastage in Germany.* Germany: University Stuttgart, Institute for Sanitary Engineering, Water Quality and Solid Waste Management (ISWA).
Krassner, H. A., Brownell, K. D. & Stunkard, A. J. (1979). Cleaning the Plate: Food Left Over by Overweight and Normal Weight Persons. *Behaviour Research and Therapy,* **17**, 155-156.
Krommuang, A., Suwunnamek, O. & Hothonhcum, K. (2017). Does the Marketing Mix Affect Street Food Consumption in Thailand? *International Journal of Business, Marketing, and Decision Sciences (IJBMDS),* **10**, 76.
Kruschke, J. K. (2013). Bayesian Estimation Supersedes the T Test. *Journal of Experimental Psychology: General,* **142**, 573-588.
Lally, P., Bartle, N. & Wardle, J. (2011). Social Norms and Diet in Adolescents. *Appetite,* **57**, 623-627.
Lancaster, T. (2004). *An Introduction to Modern Bayesian Econometrics.* Australia: Blackwell Publishing.
Lancsar, E., Fiebig, D. G. & Hole, A. R. (2017). Discrete Choice Experiments: A Guide to Model Specification, Estimation and Software. *PharmacoEconomics,* **35**, 697-716.
Landry, C. E. & Smith, T. A. (2019). Demand for Household Food Waste. *Applied Economic Perspectives and Policy,* **41**, 20-36.
Lanfranchi, M., Calabro, G., De Pascale, A., Fazio, A. & Giannetto, C. (2016). Household Food Waste and Eating Behavior: Empirical Survey. *British Food Journal,* **118**, 3059-3072.
Lazell, J. (2016). Consumer Food Waste Behaviour in Universities: Sharing as a Means of Prevention. *Journal of Consumer Behaviour,* **15**, 430-439.
Lee, Y. G. & Huh, E. (2004). Consumption and Saving Behavior of Older and Younger Baby Boomers in Korea. *Early Childhood Education Journal,* **25**, 507-526.
Leiner, D. (2013). *Too Fast, Too Straight, Too Weird: Post Hoc Identification of Meaningless Data in Internet Surveys.* Working Paper in SSRN Electronic Journal.
Leung, H. (2015). *No Doggy Bag Please: Chinese Attitudes on Food Waste.* ProQuest Dissertations Publishing.
Lewis, S. (2017). *Restaurants 2017: Food for thought*. URL: https://www.pwc.co.uk/services/business-restructuring/insights/restructuring-trends/restaurants-2017-food-for-thought.html [3 December 2019].
Liao, C., Hong, J., Zhao, D., Zhang, S. & Chen, C. (2018). Confucian Culture as Determinants of Consumers' Food Leftover Generation: Evidence from Chengdu, China. *Environmental Science and Pollution Research,* **25**, 14919-14933.
Liu, J., Lundqvist, J., Weinberg, J. & Gustafsson, J. (2013). Food Losses and Waste in China and Their Implication for Water and Land. *Environmental Science & Technology,* **47**, 10137-10144.

Liu, Y., Shi, J. & Jian, M. (2017). Understanding Visitors' Responses to Intelligent Transportation System in a Tourist City with a Mixed Ranked Logit Model. *Journal of Advanced Transportation,* **2017**, 1-13.
Loebnitz, N., Schuitema, G. & Grunert, K. G. (2015). Who Buys Oddly Shaped Food and Why? Impacts of Food Shape Abnormality and Organic Labeling on Purchase Intentions. *Psychology & Marketing,* **32**, 408-421.
Long, J. S. & Freese, J. (2014). *Regression Models for Categorical Dependent Variables Using Stata.* 3rd ed. The US: Stata Press.
Longo-Silva, G., Toloni, M., Rodrigues, S., Rocha, A. & Taddei, J. A. d. A. C. (2013). Qualitative Evaluation of the Menu and Plate Waste in Public Day Care Centers in São Paulo City, Brazil. *Revista de Nutrição,* **26**, 135-144.
Lorenz, B. A.-S., Hartmann, M. & Langen, N. (2017). What Makes People Leave Their Food? The Interaction of Personal and Situational Factors Leading to Plate Leftovers in Canteens. *Appetite,* **116**, 45-56.
Lorenz, B. A., Hartmann, M., Hirsch, S., Kanz, O. & Langen, N. (2017). Determinants of Plate Leftovers in One German Catering Company. *Sustainability,* **9**.
Lorenz, B. A. & Langen, N. (2018). Determinants of How Individuals Choose, Eat and Waste: Providing Common Ground to Enhance Sustainable Food Consumption Out-of-home. *International Journal of Consumer Studies,* **42**, 35-75.
Love Food Hate Waste. (2015). *Love Food Hate Waste-Community Likes Details*. URL: https://www.facebook.com/LoveFoodHateWasteCommunity/likes [11 August 2015].
Love Food Hate Waste NZ. (2020). *About Us*. URL: https://lovefoodhatewaste.co.nz/about-us/ [18 July 2020].
Lusk, J. L. & Ellison, B. (2017). A Note on Modelling Household Food Waste Behaviour. *Applied Economics Letters,* **24**, 1199.
Lusk, J. L. & McCluskey, J. (2018). Understanding the Impacts of Food Consumer Choice and Food Policy Outcomes. *Applied Economic Perspectives and Policy,* **40**, 5-21.
Makowski, D., Ben-Shachar, M. S., Chen, S. H. A. & Lüdecke, D. (2019). Indices of Effect Existence and Significance in the Bayesian Framework. *Frontiers in Psychology,* **10**.
Malhotra, N. K., Nunan, D. & Birks, D. F. (2017). *Marketing Research: An Applied Approach.* New York: Pearson.
Mallinson, L. J., Russell, J. M. & Barker, M. E. (2016). Attitudes and Behaviour Towards Convenience Food and Food Waste in The United Kingdom. *Appetite,* **103**, 17-28.
Martindale, W. (2015). *Global Food Security and Supply.* UK: John Wiley & Sons, Ltd.
Matsumoto, D., Kudoh, T. & Takeuchi, S. (1996). Changing Patterns of Individualism and Collectivism in the United States and Japan. *Culture & Psychology,* **2**, 77-107.
Mazzocchi, M. (2008). *Statistics for Marketing and Consumer Research.* Great Britain: SAGE Publications Ltd.
McAdams, C., Palma, M. A., Hall, C. & Ishdorj, A. (2015). A Nonhypothetical Ranking and Auction Mechanism for Novel Products. *Journal of Agricultural and Applied Economics,* **45**, 35-52.
McCarthy, B. & Liu, H.-B. (2017). 'Waste Not, Want Not' Exploring Green Consumers' Attitudes Towards Wasting Edible Food and Actions to Tackle Food Waste. *British Food Journal,* **119**, 2519-2531.

McFadden, D. & Train, K. (2000). Mixed MNL Models for Discrete Response. *Journal of Applied Econometrics,* **15**, 447-470.
McHugh, M. L. (2013). The Chi-Square Test of Independence. *Biochemia medica,* **23**, 143.
McKinley, T. J., Morters, M. & Wood, J. L. N. (2015). Bayesian Model Choice in Cumulative Link Ordinal Regression Models. *Bayesian Analysis,* **10**, 1-30.
Meilgaard, M. C., Civille, G. V. & Carr, B. T. (2007). *Sensory Evaluation Techniques.* 4th ed. USA: CRC Press.
Metropolis, N., Rosenbluth, A. W., Rosenbluth, M. N. & Teller, A. H. (1953). Equation of State Calculations by Fast Computing Machines. *The Journal of Chemical Physics,* **21**, 1087-1092.
Miles, M. B., Huberman, A. M. & Saldana, J. (2013). *Qualitative Data Analysis: A Methods Sourcebook.* United States of America: SAGE Publications.
Mills, S., Adams, J., Wrieden, W., White, M. & Brown, H. (2018). Sociodemographic Characteristics and Frequency of Consuming Home-Cooked Meals and Meals from Out-of-Home Sources: Cross-Sectional Analysis of A Population-Based Cohort Study. *Proceedings of the International Astronomical Union,* **21**, 1;2255;-12;2266;.
Minor, T., Hitaj, C., Kuchler, F., Skorbiansky, S. R., Roe, B. & Thornsbury, S. (2019). Exploring Food Loss from Farm-to-retail in the Produce Industry. *Choices,* **34**, Available online: http://www.choicesmagazine.org/choices-magazine/theme-articles/food-waste-reduction-strategies/exploring-food-loss-from-farm-to-retail-in-the-produce-industry.
Mirosa, M., Liu, Y. & Mirosa, R. (2018). Consumers' Behaviors and Attitudes toward Doggy Bags: Identifying Barriers and Benefits to Promoting Behavior Change. *Journal of Food Products Marketing,* **24**, 563-590.
Mirosa, M., Mainvil, L., Chisnall, S., Jones, E., Marshall, J. & Wassilak, C. (2018). Food Waste in the Cafe & Restaurant Sector in New Zealand. New Zealand: WasteMINZ.
Mokhtarian, P. L. (2016). Presenting the Independence of Irrelevant Alternatives Property in a First Course on Logit Modeling. *Journal of Choice Modelling,* **21**, 25-29.
Mollen, S., Rimal, R. N., Ruiter, R. A. C. & Kok, G. (2013). Healthy and Unhealthy Social Norms and Food Selection. Findings From a Field-experiment. *Appetite,* **65**, 83-89.
Møller, H., Hanssen, O. J., Svanes, E., Hartikainen, H., Silvennoinen, K., Gustavsson, J., Östergren, K., Schneider, F., Soethoudt, H., Canali, M., Politano, A., Gaiani, S., Redlingshöfer, B., Moates, G., Waldron, K. & Stenmarck, Å. (2014). *Standard Approach on Quantitative Techniques to be Used to Estimate Food Waste Levels.* Fredrikstad: EU 7th Framework Program (Project Number: 311972).
Mourad, M. (2015). France Moves Toward a National Policy Against Food Waste. Paris: The Natural Resources Defense Council.
Mungkung, R. & Busch, N. (2017). Stakeholder Workshop: Toward SDG12-SCP Patterns Through the Implementation of 10YFP in Thailand. Thailand: Thailand-European Union Policy Dialogues Support Facility.
Nair, G. S., Astroza, S., Bhat, C. R., Khoeini, S. & Pendyala, R. M. (2018). An Application of a Rank Ordered Probit Modeling Approach to Understanding Level of Interest in Autonomous Vehicles. *Transportation,* **45**, 1623-1637.
Nannyonga, S., Bakalis, S., Andrews, J., Mugampoza, E. & Gkatzionis, K. (2016). Mathematical Modelling of Color, Texture Kinetics and Sensory Attributes

Characterisation of Ripening Bananas for Waste Critical Point Determination. *Journal of Food Engineering,* **190**, 205-210.
National Statistical Office of Thailand (2010). Population and Housing Census. Thailand: Ministry of Information and Communication Technology.
NECTEC. (n.d.). *English Thai Dictionary*. URL: https://english-thai-dictionary.com/dictionary/?cof=FORID%3A10&ie=UTF-8&q=%E0%B9%80%E0%B8%AA%E0%B8%B5%E0%B8%A2%E0%B8%94%E0%B8%B2%E0%B8%A2&sa=Dictionary-search&fields%5B%5D=related&siteurl=english-thai-dictionary.com%2Findex.php%3Faction%3Ddictionary%3Bsa%3Dsearch%3Bfields%3Drelated%3Bsearch%3D%2525E0%2525B9%252580%2525E0%2525B8%2525AA%2525E0%2525B8%2525B5%2525E0%2525B8%2525A2%2525E0%2525B8%252594%2525E0%2525B8%2525B2%2525E0%2525B8%252&ref=&ss=837j135931j9 [17 December 2019].
Neff, R. A., Spiker, M. L. & Truant, P. L. (2015). Wasted Food: US Consumers' Reported Awareness, Attitudes, and Behaviors. *PLOS ONE,* **10**, e0127881.
New Zealand Parliament. (2018). *Taking Steps to Prevent Food Waste*. URL: https://www.parliament.nz/en/get-involved/features/taking-steps-to-prevent-food-waste/ [28 July 2020].
Nicolas, S. (1995). Joseph Delboeuf on Visual Illusions: A Historical Sketch. *The American Journal of Psychology,* **108**, 563-574.
nidirect. (n.d.). *Food Waste*. URL: https://www.nidirect.gov.uk/articles/food-waste [23 June 2020].
Nikolaus, C. J., Nickols-Richardson, S. M. & Ellison, B. (2018). Wasted Food: A Qualitative Study of U.S. Young Adults' Perceptions, Beliefs and Behaviors. *Appetite,* **130**, 70-78.
Nikomborirak, D., Srisuwannaket, T., Liumpetch, C. & Gebben, S. (2019). Full Report: Karn Suksa Naew Tang Karn Boriharn Judkarn Aharn Suan Kern Peu Lod Punha Kaya Aharn tee Mosom Kup Prathet Thai (Thai language). Thailand Development Research Institute.
Ofei, K. T., Holst, M., Rasmussen, H. H. & Mikkelsen, B. E. (2014). How Practice Contributes to Trolley Food Waste. A Qualitative Study Among Staff Involved in Serving Meals to Hospital Patients. *Appetite,* **83**, 49-56.
Office for National Statistics. (2011). *2011 Census Data Catalogue*. URL: https://www.ons.gov.uk/census/2011census/2011censusdata/2011censusdatacatalogue [3 December 2018].
Office for National Statistics. (2012). *Religion in England and Wales 2011*. URL: https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/religion/articles/religioninenglandandwales2011/2012-12-11 [18 December 2019].
Office for National Statistics. (2018). *Detailed household expenditure by equivalised disposable income decile group: Table 3.1E*. URL: https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/datasets/detailedhouseholdexpenditurebyequivalisedisposableincomedecilegroupoecdmodifiedscaleuktable31e [29 May 2018].
Office for National Statistics of UK (2017). Overview of the UK Population: July 2017. UK.
Olson, J. C. (1972). *Cue Utilization in the Quality Perception Process: A Cognitive Model Andan Empirical Test.* Purdue University.
Osagie, A. U. (1995). Assessment of Loss in Perishable Crops. *In:* Osagie, A. U. (ed.) *Tropical Postharvest.* Benin City, Nigeria: Postharvest Research Unit, Department of Biochemistry, University of Benin.

Pagès, J. (2005). Collection and Analysis of Perceived Product Inter-Distances Using Multiple Factor Analysis: Application to The Study of 10 White Wines from The Loire Valley. *Food Quality and Preference,* **16**, 642-649.
Palma, M. A. (2017). Improving the Prediction of Ranking Data. *Empirical Economics,* **53**, 1681-1710.
Pan, A., Malik, V. S. & Hu, F. B. (2012). Exporting Diabetes Mellitus to Asia: The Impact of Western-Style Fast Food. *Circulation,* **126**, 163-165.
Parfitt, J., Barthel, M. & Macnaughton, S. (2010). Food Waste within Food Supply Chains: Quantification and Potential for Change to 2050. *Philosophical Transactions of the Royal Society of London B: Biological Sciences,* **365**, 3065-3081.
Parizeau, K., von Massow, M. & Martin, R. (2015). Household-level Dynamics of Food Waste Production and Related Beliefs, Attitudes, and Behaviours in Guelph, Ontario. *Waste Management,* **35**, 207-217.
PATA. (2018). *PATA x Thai-SOS – The Food Waste Agenda in Thailand*. URL: https://sustain.pata.org/pata-x-thai-sos-the-food-waste-agenda-in-thailand/ [1 July 2020].
Pierce, J. J., Siddiki, S., Jones, M. D., Schumacher, K., Pattison, A. & Peterson, H. (2014). Social Construction and Policy Design: A Review of Past Applications. *Policy Studies Journal,* **42**, 1-29.
Pinstrup-Andersen, P. & Watson II, D. D. (2011). *Food Policy for Developing Countries.* New York: Cornell University Press.
Pirani, S. I. & Arafat, H. A. (2016). Reduction of Food Waste Generation in the Hospitality Industry. *Journal of Cleaner Production,* **132**, 129-145.
Pliner, P. & Mann, N. (2004). Influence of Social Norms and Palatability on Amount Consumed and Food Choice. *Appetite,* **42**, 227-237.
Pollution Control Department (2019). Saroob Satanakarn Mollapit Kong Prathet Thai Year 2561 (Thai langauge). Ministry of Natural Resource and Environment.
Ponis, S. T., Papanikolaou, P.-A., Katimertzoglou, P., Ntalla, A. C. & Xenos, K. I. (2017). Household Food Waste in Greece: A Questionnaire Survey. *Journal of Cleaner Production,* **149**, 1268-1277.
Porpino, G., Parente, J. & Wansink, B. (2015). Food Waste Paradox: Antecedents of Food Disposal in Low Income Households. *International Journal of Consumer Studies,* **39**, 619-629.
Priefer, C., Jörissen, J. & Bräutigam, K.-R. (2016). Food waste prevention in Europe – A cause-driven approach to identify the most relevant leverage points for action. *Resources, Conservation and Recycling,* **109**, 155-165.
Principato, L., Pratesi, C. A. & Secondi, L. (2018). Towards Zero Waste: an Exploratory Study on Restaurant Managers. *International Journal of Hospitality Management,* **74**, 130-137.
Principato, L., Secondi, L. & Pratesi, C. A. (2015). Reducing Food Waste: An Investigation on the Behaviour of Italian Youths. *British Food Journal,* **117**, 731-748.
Pullman, M. & Wu, Z. (2012). *Food Supply Chain: Economic, Social, and Environmental Perspectives.* UK: Routledge.
Qi, D. & Roe, B. E. (2017). Foodservice Composting Crowds Out Consumer Food Waste Reduction Behavior in a Dining Experiment. *American Journal of Agricultural Economics,* **99**, 1159-1171.
Qi, D. Y. & Roe, B. E. (2016). Household Food Waste: Multivariate Regression and Principal Components Analyses of Awareness and Attitudes among US Consumers. *PLOS ONE,* **11**, e0159250.

Quested, T., Ingle, R. & Parry, A. (2013). *Household Food and Drink Waste in the United Kingdom 2012.* UK: WRAP.
Quested, T. E., Marsh, E., Stunell, D. & Parry, A. D. (2013). Spaghetti Soup: The Complex World of Food Waste Behaviours. *Resources, Conservation and Recycling,* **79**, 43-51.
Quested, T. E., Parry, A. D., Easteal, S. & Swannell, R. (2011). Food And Drink Waste from Households in The Uk. *Nutrition Bulletin,* **36**, 460-467.
Quinn, I. (2015). *France Supermarket Food Waste Law Piles Pressure on UK*. URL: http://www.thegrocer.co.uk/channels/supermarkets/france-supermarket-food-waste-law-piles-pressure-on-uk/519015.article [11 August 2015].
Reutter, B., Lant, P., Reynolds, C. & Lane, J. (2017). Food Waste Consequences: Environmentally Extended Input-output as a Framework for Analysis. *Journal of Cleaner Production,* **153**, 506-514.
Revelt, D. & Train, K. (1998). Mixed Logit with Repeated Choices: Households' Choices of Appliance Efficiency Level. *The Review of Economics and Statistics,* **80**, 647-657.
Richter, B. & Bokelmann, W. (2017). Explorative Study about the Analysis of Storing, Purchasing, and Wasting Food by Using Household Diaries. *Resources Conservation and Recycling,* **125**, 181-187.
Rispo, A., Williams, I. D. & Shaw, P. J. (2015). Source Segregation and Food Waste Prevention Activities in High-Density Households in A Deprived Urban Area. *Waste Management,* **44**, 15-27.
Risvik, E., McEwan, J. A., Colwill, J. S., Rogers, R. & Lyon, D. H. (1994). Projective Mapping: a Tool for Sensory Analysis and Consumer Research. *Food Quality and Preference,* **5**, 263-269.
Robinson, E. & Hardman, C. A. (2016). Empty Plates and Larger Waists: A Cross-sectional Study of Factors associated with Plate Clearing Habits and Body Weight. *European Journal of Clinical Nutrition,* **70**, 750-752.
Robson, S. (2013). Small Wonder: The Case for Smaller Restaurants and How to Maximize Them. *Restaurant Startup and Growth*, **4**. URL: http://scholarship.sha.cornell.edu/cgi/viewcontent.cgi?article=1132&context=articles [30 January 2018].
Rohm, H., Oostindjer, M., Aschemann-Witzel, J., Symmank, C., Almli, V. L., de Hooge, I., Normann, A. & Karantininis, K. (2017). Consumers in a Sustainable Food Supply Chain (COSUS): Understanding Consumer Behavior to Encourage Food Waste Reduction. *Foods,* **6**, 104.
Rolle, R. S. (2014). *Reducing Food Losses and Waste in Asian Countries for Improved Food Security and Agri-Food Chain Efficiency.* FAO Regional Office for Asia and the Pacific: Save Food Asia-Pacific Campaign.
Roodhuyzen, D. M. A., Luning, P. A., Fogliano, V. & Steenbekkers, L. P. A. (2017). Putting Together the Puzzle of Consumer Food Waste: Towards an Integral Perspective. *Trends in Food Science & Technology,* **68**, 37-50.
Rovinelli, R. J. & Hambleton, R. K. (1976). On the Use of Content Specialists in the Assessment of Criterion-referenced Test Item Validity. California, The US: Ameican Educational Research Association.
Rowley, J. (2012). Conducting Research Interviews. *Management Research Review,* **35**, 260-271.
Russell, S. V., Young, C. W., Unsworth, K. L. & Robinson, C. (2017). Bringing Habits and Emotions into Food Waste Behaviour. *Resources Conservation and Recycling,* **125**, 107-114.
Rutherford, D. (2013). *Dictionary of Economics.* 4 ed. London, UK: Routledge.

Rutten, M. (2013). What Economic Theory Tells Us About the Impacts of Reducing Food Losses and/or Waste: Implications for Research, Policy and Practice. *Agriculture & Food Security,* **2**, 13.
Ruxton, G. D. & Beauchamp, G. (2008). Some Suggestions about Appropriate Use of The Kruskal–Wallis Test. *Animal behaviour,* **76**, 1083-1087.
Ryan, I., Cowan, C., McCarthy, M. & O'Sullivan, C. (2004). Food-Related Lifestyle Segments in Ireland with a Convenience Orientation. *Journal of International Food & Agribusiness Marketing,* **14**, 29-47.
Sakaguchi, L., Pak, N. & Potts, M. D. (2018). Tackling the Issue of Food Waste in Restaurants: Options for Measurement Method, Reduction and Behavioral Change. *Journal of Cleaner Production,* **180**, 430-436.
Sakunpong, N., Choochom, O. & Taephant, N. (2015). Development of a Resilience Scale for Thai Substance-dependent Women: A Mixed Methods Approach. *Asian Journal of Psychiatry,* **22**, 177-181.
Sauer, C., Auspurg, K., Hinz, T. & Liebig, S. (2014). The Application of Factorial Surveys in General Population Samples: The Effects of Respondent Age and Education on Response Times and Response Consistency. *Survey Research Methods,* **5**, 89-102.
Savage, J. (2018). *Ranked choice random coefficients logit in Stan*. URL: https://khakieconomics.github.io/2018/12/27/Ranked-random-coefficients-logit.html [11 May 2019].
Save Food Asia-Pacific. (2016). *Save Food Asia-Pacific: Reduce Food Loss and Waste*. URL: http://www.savefood.net/ [2 May 2016].
Schanes, K., Dobernig, K. & Gözet, B. (2018). Food Waste Matters - A Systematic Review of Household Food Waste Practices and Their Policy Implications. *Journal of Cleaner Production,* **182**, 978-991.
Scherhaufer, S., Moates, G., Hartikainen, H., Waldron, K. & Obersteiner, G. (2018). Environmental Impacts of Food Waste in Europe. *Waste Management,* **77**, 98-113.
Scholderer, J. & Grunert, K. G. (2005). Consumers, Food and Convenience: The Long Way from Resource Constraints to Actual Consumption Patterns. *Journal of Economic Psychology,* **26**, 105-128.
Schwartz, S. H. (1977). Normative Influences on Altruism. *In:* Berkowitz, L. (ed.) *Advances in Experimental Social Psychology.* Academic Press.
Secondi, L., Principato, L. & Laureti, T. (2015). Household Food Waste Behaviour in EU-27 Countries: A Multilevel Analysis. *Food Policy,* **56**, 25-40.
Setti, M., Falasconi, L., Segrè, A., Cusano, I. & Vittuari, M. (2016). Italian Consumers' Income and Food Waste Behavior. *British Food Journal,* **118**, 1731-1746.
Severo, E. A., Guimarães, J. C. F. d., Brito, L. M. P. & Dellarmelin, M. L. (2018). Environmental Sustainability and Sustainable Consumption: The Perception of Baby Boomers, Generation X And Y in Brazil. *Revista de Gestão Social e Ambiental,* **11**, 92-110.
Shannon, J. & Christian, W. J. (2017). What is the Relationship between Food Shopping and Daily Mobility? A Relational Approach to Analysis of Food Access. *GeoJournal,* **82**, 769-785.
Sharp, D. E. (2016). Validating the Plate Mapping Method: Comparing Drawn Foods and Actual Foods of University Students in a Cafeteria. *Appetite,* **100**, 197-202.
Shaw, H. J. (2014). *The Consuming Geographies of Food.* UK: Routledge.
Shimmura, T. & Takenaka, T. (Year). Analysis of Eating Behavior in Restaurants Based on Leftover Food. *In*, 2010 2010. IEEE, 956-960.

Silvenius, F., Gronman, K., Katajajuuri, J.-M., Soukka, R., Koivupuro, H.-K. & Virtanen, Y. (2014). The Role of Household Food Waste in Comparing Environmental Impacts of Packaging Alternatives. *Packaging Technology and Science,* **27**, 277-292.

Singelis, T. M., Triandis, H. C., Bhawuk, D. P. S. & Gelfand, M. J. (1995). Horizontal and Vertical Dimensions of Individualism and Collectivism: A Theoretical and Measurement Refinement. *Cross-Cultural Research,* **29**, 240-275.

Sinha, J. B. P., Vohra, N., Singhal, S., Sinha, R. B. N. & Ushashree, S. (2002). Normative Predictions of Collectivist-individualist Intentions and Behaviour of Indians. *International Journal of Psychology,* **37**, 309-319.

Sirieix, L., Lála, J. & Kocmanová, K. (2017). Understanding the Antecedents of Consumers' Attitudes Towards Doggy Bags in Restaurants: Concern About Food Waste, Culture, Norms and Emotions. *Journal of Retailing and Consumer Services,* **34**, 153-158.

Sirikeratikul, S. (2018). Thailand: Food Service - Hotel Restaurant Institutional. Bangkok: USDA Foreign Agricultural Service.

Sivadas, E., Bruvold, N. T. & Nelson, M. R. (2008). A Reduced Version of the Horizontal and Vertical Individualism and Collectivism Scale: A Four-country Assessment. *Journal of Business Research,* **61**, 201-210.

Solomon, M. R. (2015). *Consumer Behaviour: Buying, Having, and Being.* 7th ed. England: Pearson Education Limited.

Soma, T. (2017). Gifting, Ridding and the "Everyday Mundane": The Role of Class and Privilege in Food Waste Generation in Indonesia. *Local Environment,* **22**, 1444-1460.

Soma, T. (2019). Space to Waste: The Influence of Income and Retail Choice on Household Food Consumption and Food Waste In Indonesia. *International Planning Studies*, 1-21.

Soma, T. & Lee, K. (2016). From “Farm to Table” to “Farm to Dump”: Emerging Research on Household Food Waste in the Global South. *Conversation in food studies.* University of Manitoba Press Winnipeg.

Spiggle, S. (1994). Analysis and Interpretation of Qualitative Data in Consumer Research. *Journal of Consumer Research,* **21**, 491-503.

Srisuwannaket, T. & Liumpetch, C. (2019). *Tackling Thailand's Food-waste Crisis*. URL: https://tdri.or.th/en/2019/10/tackling-thailands-food-waste-crisis/#:~:text=Thailand%20is%20lagging%20far%20behind,of%20the%20food%20waste%20collected. [30 June 2020].

Stancu, V., Haugaard, P. & Lähteenmäki, L. (2016). Determinants of Consumer Food Waste Behaviour: Two Routes to Food Waste. *Appetite,* **96**, 7-17.

Stangherlin, I. d. C. & de Barcellos, M. D. (2018). Drivers and Barriers to Food Waste Reduction. *British Food Journal,* **120**, 2364-2387.

Steenhuis, I. H. M. & Vermeer, W. M. (2009). Portion Size: Review And Framework for Interventions. *International Journal of Behavioral Nutrition and Physical Activity,* **6**, 58-58.

Stefan, V., van Herpen, E., Tudoran, A. A. & Lähteenmäki, L. (2013). Avoiding Food Waste by Romanian Consumers: The Importance of Planning and Shopping Routines. *Food Quality and Preference,* **28**, 375-381.

Steiner, P. M., Atzmüller, C. & Su, D. (2016). Designing Valid and Reliable Vignette Experiments for Survey Research: A Case Study on the Fair Gender Income Gap. *Journal of Methods and Measurement in the Social Sciences,* **7**.

Stern, H. S. (2016). A Test by Any Other Name: P Values, Bayes Factors, and Statistical Inference. *Multivariate Behavioral Research,* **51**, 23-29.

Stewart, D. W., Shamdasani, P. N. & Rook, D. W. (2007). *Focus Groups.* The US: Sage Publications, Inc.
Storey, R., Gapen, M. & Sacco, J. S. (2014). Projective Techniques and Psychological Assessment in Disadvantaged Communities: Projective Techniques and Psychological Assessment. *International Journal of Applied Psychoanalytic Studies,* **11**, 114-129.
Stuart, T. (2009). *Waste: Uncovering the Global Food Scandal.* London: W. W. Norton & Co. .
Sultan, P., Wong, H. Y. & Sigala, M. (2018). Segmenting the Australian Organic Food Consumer Market. *Asia Pacific Journal of Marketing and Logistics,* **30**, 163-181.
Sun, G., D'Alessandro, S., Johnson, L. W. & Winzar, H. (2014). Do We Measure What We Expect to Measure? Some Issues in the Measurement of Culture in Consumer Research. *International Marketing Review,* **31**, 338-362.
Symmank, C., Zahn, S. & Rohm, H. (2018). Visually Suboptimal Bananas: How Ripeness Affects Consumer Expectation and Perception. *Appetite,* **120**, 472-481.
Takata, M., Fukushima, K., Kino-Kimata, N., Nagao, N., Niwa, C. & Toda, T. (2012). The Effects of Recycling Loops in Food Waste Management in Japan: Based on the Environmental and Economic Evaluation of Food Recycling. *Science of the Total Environment,* **432**, 309-317.
Tantitaweewattana, T. (2015). *The Factors Positively Relating and Influencing Healthy Food's Purchase Intention of Consumers in Bangkok.* Master thesis, Bangkok University.
Tesco PLC. (2020). *Tesco Lotus Food Waste Data 2019/20*. URL: https://www.tescoplc.com/sustainability/performance/data-tables/food-waste-data/tesco-lotus-food-waste-data/ [14 July 2020].
Thailand - European Union Policy Dialogues Support Facility (2017). Tesco Lotus: Sustaniable Production and Consumption. Thailand.
Thailand National Statistical Office. (2018). *Executive Summary: Household Socio-Economic Sample Survey B.E. 2560 (2017)*. URL: http://www.nso.go.th/sites/2014en/Pages/survey/Social/Household/The-2017-Household-Socio-Economic-Survey.aspx [29 May 2018].
Thanawat, K. (2019). *Krasuang Sappayakorn Thammachat lae Singwaedlorm Dernna Kae Punha lae Wang Rabop Boriharn-gnan Chudkarn Kaya Aharn Hai Laew Sed Peu Lod Pariman Kaya Peak Nai Prathet teemee Yuu Tung Loyla 60 (Thai language)*. URL: http://thainews.prd.go.th/th/news/detail/TCATG190713185436905 [16 December 2019].
The Sustainable Restaurant Association (2019). Food Waste Bad Taste: Food Made Good. The UK.
Thurstone, L. L. (1994). A Law of Comparative Judgment. *Psychological Review,* **101**, 266-270.
Thyberg, K. L. & Tonjes, D. J. (2016). Drivers of Food Waste and Their Implications for Sustainable Policy Development. *Resources, Conservation and Recycling,* **106**, 110-123.
Tokareva, T. & Eglite, A. (2014). Non-Price Factors That Influence Consumers' Wasted Food Amounts. *In:* Straumite, E. (ed.) *9th Baltic Conference on Food Science and Technology - Food for Consumer Well-Being: Foodbalt 2014.*
Tonini, D., Albizzati, P. F. & Astrup, T. F. (2018). Environmental Impacts of Food Waste: Learnings and Challenges From a Case Study on UK. *Waste Management,* **76**, 744-766.

Tostivint, C., Östergren, K., Quested, T., Soethoudt, H., Stenmarck, Å., Svanes, E. & O'Conno, C. (2016). Food Waste Quantification Manual to Monitor Food Waste Amounts and Progression. Paris: FUSIONS project.
Train, K. (2016). Mixed logit with a flexible mixing distribution. *Journal of Choice Modelling,* **19**, 40-53.
Train, K. E. (2009). *Discrete Choice Methods with Simulation.* Cambridge, UK: Cambridge University Press.
Trepka, M. J., Murunga, V., Cherry, S., Huffman, F. G. & Dixon, Z. (2006). Food Safety Beliefs and Barriers to Safe Food Handling among WIC Program Clients, Miami, Florida. *Journal of Nutrition Education and Behavior,* **38**, 371-377.
Triandis, H. C. & Gelfand, M. J. (1998). Converging Measurement of Horizontal and Vertical Individualism and Collectivism. *Journal of Personality and Social Psychology,* **74**, 118-128.
Tucker, C. (2013). Insects, Offal, Feet and Faces: Acquiring New Tastes in New Zealand? *New Zealand Sociology,* **28**, 101-122.
Tucker, C. A. & Farrelly, T. (2016). Household Food Waste: the Implications of Consumer Choice in Food From Purchase to Disposal. *Local Environment,* **21**, 682-706.
Tuorila, H. & Monteleone, E. (2009). Sensory Food Science in the Changing Society: Opportunities, Needs, and Challenges. *Trends in Food Science & Technology,* **20**, 54-62.
Turner, R. C. & Carlson, L. (2003). Indexes of Item-Objective Congruence for Multidimensional Items. *International Journal of Testing,* **3**, 163-171.
UN. (2015). *Paris Agreement*. URL: https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf [1 January 2020].
UN. (2016). *Sustainable Development Goal 12. Ensure Sustainable Consumption and Production Patterns*. URL: https://sustainabledevelopment.un.org/sdg12 [10 December 2019].
UN Department of Economic and Social Affairs Population Division (2019). World Population Prospects 2019: Data Booklet. Department of Economic and Social Affairs, Population Division. (ST/ESA/SER.A/424).
UNEP (2011). Decoupling Natural Resource Use and Environmental Impacts From Economic Growth. A Report of the Working Group on Decoupling to the International Resource Panel: Fischer-Kowalski, M., Swilling, M., von Weizsäcker, E.U., Ren, Y., Moriguchi, Y., Crane, W., Krausmann, F., Eisenmenger, N., Giljum, S., Hennicke, P., Romero Lankao, P., Siriban Manalang, A. .
United Nations Population Division (1999). The twenty most populous countries in 1950, 1999 and 2050. *World Population Prospects: The 1998 Revision*

United Nations, Population Division, Department of Economic and Social Affairs.
United States Environmental Protection Agency (2012). Putting Surplus Food To Good USe. The US.
United States Environmental Protection Agency. (2017a). *A Call to Action by Stakeholders: United States Food Loss & Waste 2030 Reduction Goal*. URL: https://www.epa.gov/sustainable-management-food/call-action-stakeholders-united-states-food-loss-waste-2030-reduction [15 July 2020].
United States Environmental Protection Agency. (2017b). *Sustainable Management of Food*. URL: https://www.epa.gov/sustainable-management-food/food-recovery-hierarchy [06 April 2018].

Vandermeersch, T., Alvarenga, R. A. F., Ragaert, P. & Dewulf, J. (2014). Environmental Sustainability Assessment of Food Waste Valorization Options. *Resources, Conservation and Recycling,* **87**, 57-64.
Verghese, K., Lewis, H., Lockrey, S. & Williams, H. (2015). Packaging's Role in Minimizing Food Loss and Waste Across the Supply Chain. *Packaging Technology and Science,* **28**, 603-620.
Vidal, L., Ares, G. & Giménez, A. (2013). Projective Techniques to Uncover Consumer Perception: Application of Three Methodologies to Ready-to-eat Salads. *Food Quality and Preference,* **28**, 1-7.
Vijfvinkel, C. (2017). *Modelling Heterogeneity in Rank-ordered Data.* Bachelor, Erasmus Universiteit Rotterdam, Erasmus School of Economics.
Wang, L.-e., Liu, G., Liu, X., Liu, Y., Gao, J., Zhou, B., Gao, S. & Cheng, S. (2017). The Weight of Unfinished Plate: A Survey Based Characterization of Restaurant Food Waste in Chinese Cities. *Waste Management,* **66**, 3-12.
Wang, Y., Xu, S. w., Yu, W. A. A.-g., Liu, X. J., Bai, J. F., Zhang, D., Gao, L. W., Cao, X. C. & Liu, Y. (2016). Food Packing: A Case Study of Dining Out in Beijing. *Journal of Integrative Agriculture,* **15**, 1924-1931.
Wansink, B. (2004). Environmental Factors that Increase the Food Intake and Consumption Volume of Unknowing Consumers. *Annual Review of Nutrition,* **24**, 455-479.
Wansink, B. & van Ittersum, K. (2013). Portion Size Me: Plate-Size Induced Consumption Norms and Win-Win Solutions for Reducing Food Intake and Waste. *Journal of Experimental Psychology-Applied,* **19**, 320-332.
Wellington City Council. (n.d.). *Food Waste in New Zealand*. URL: https://wellington.govt.nz/services/environment-and-waste/rubbish-and-recycling/reducing-your-waste/reducing-waste-at-home/food-waste-in-nz [18 July 2020].
WHO. (2017). *Malnutrition*. URL: http://www.who.int/mediacentre/factsheets/malnutrition/en/ [20 March 2018].
Wikström, F., Williams, H. & Venkatesh, G. (2016). The Influence of Packaging Attributes on Recycling and Food Waste Behaviour – An Environmental Comparison of Two Packaging Alternatives. *Journal of Cleaner Production,* **137**, 895-902.
Williams, H. & Wikstrom, F. (2011). Environmental Impact of Packaging and Food Losses in a Life Cycle Perspective: A Comparative Analysis of Five Food Items. *Journal of Cleaner Production,* **19**, 43-48.
Williams, H., Wikström, F. & Löfgren, M. (2008). A Life Cycle Perspective on Environmental Effects of Customer Focused Packaging Development. *Journal of Cleaner Production,* **16**, 853-859.
Williams, H., Wikstrom, F., Otterbring, T., Lofgren, M. & Gustafsson, A. (2012). Reasons for Household Food Waste with Special Attention to Packaging. *Journal of Cleaner Production,* **24**, 141-148.
Wilson, N. L. W., Rickard, B. J., Saputo, R. & Ho, S.-T. (2017). Food Waste: The Role of Date Labels, Package Size, and Product Category. *Food Quality and Preference,* **55**, 35-44.
Winer, B. J. (1971). *Statistical Principles in Experimental Design.* The United States of America: McGraw-Hill, Inc.
World Bank. (2016). *Renewable Internal Freshwater Resources, Total (Billion Cubic Meters)*. URL: http://data.worldbank.org/indicator/ER.H2O.INTR.K3 [03 April 2017].

World Bank. (2018a). *Population, Total*. URL: https://data.worldbank.org/indicator/SP.POP.TOTL?locations=TH-GB [30 May 2018].
World Bank. (2018b). *PPP conversion factor, private consumption (LCU per international $)*. URL: https://data.worldbank.org/indicator/PA.NUS.PRVT.PP?locations=GB-TH [16 June 2018].
World Bank. (2019). *Thailand Became an Upper-middle Income Economy in 2011.* URL: http://www.worldbank.org/en/country/thailand/overview [6 August 2019].
WRAP (2013). Where Food Waste Arises within the UK Hospitality and Food Service Sector: Spoilage, Preparation and Plate Waste. UK.
WRAP. (2017a). *Food Waste Reduction*. URL: http://www.wrap.org.uk/food-waste-reduction [2 March 2017].
WRAP (2017b). Household Food Waste in the UK, 2015. UK.
WRAP (2017c). Restaurants: Taking Action on Waste. UK.
WRAP. (2018a). *About Love Food Hate Waste*. URL: https://www.lovefoodhatewaste.com/about-us [2 March 2017].
WRAP. (2018b). *UK Food Redistribution 2015 to 2017*. URL: http://www.wrap.org.uk/content/uk-food-redistribution-increase [23 June 2020].
WRAP. (n.d.). *How is Food Waste Recycled?* URL: https://www.recyclenow.com/recycling-knowledge/how-is-it-recycled/food-waste [23 June 2020].
Xiao, J. X. & Siu, K. W. M. (2018). Challenges in Food Waste Recycling in High-Rise Buildings and Public Design for Sustainability: A Case in Hong Kong. *Resources, Conservation and Recycling,* **131**, 172-180.
Xie, B., Wang, L., Yang, H., Wang, Y. & Zhang, M. (2015). Consumer Perceptions and Attitudes of Organic Food Products in Eastern China. *British Food Journal,* **117**, 1105-1121.
Yin, R. K. (2015). *Qualitative Research From Start to Finish.* Guilford Publications.
Young, E. M. (2012). *Food and Development.* New York: Routledge.
Yukalang, N., Clarke, B. & Ross, K. (2018). Solid Waste Management Solutions for A Rapidly Urbanizing Area in Thailand: Recommendations Based on Stakeholder Input. *International Journal of Environmental Research and Public Health,* **15**, 1302.
Zhang, R. & Weng, L. (2019). Not All Cultural Values are Created Equal: Cultural Change in China Reexamined through Google Books. *International Journal of Psychology,* **54**, 144-154.
Zuraikat, F. M., Roe, L. S., Smethers, A. D. & Rolls, B. J. (2018). Doggy Bags and Downsizing: Packaging Uneaten Food to Go after A Meal Attenuates the Portion Size Effect in Women. *Appetite,* **129**, 162-170.

Appendix 1 - Literature Review Table

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
1	Williams et al. (2012)	2012 (2009 and 2010)	Reason for household FW and roles of packaging	FW diaries and questionnaire	61 families	Sweden	FW and packaging 1) too big, 2) difficult to empty, 3) date labelling. Environmentally educated households who know about date labelling waste less.	Economic cost of food waste.
2	Koivupuro et al. (2012)	2012 (2010)	Quantity, quality, and reasons for avoidable household FW. Factors; - socio-demographical - behavioural and - attitudinal	Questionnaire survey and a FW diary	380 households (1054 people)	Finland	Smaller household, less waste. Those who waste more are: women responsible for food shopping (single), people who did not prefer discounted food, who think they can reduce more, who believe purchasing large packages was the reason for wasting food. Age of the oldest adult, residence, education/work, and food habits has no clear correlation.	Food expenditure might be more meaningful than household earnings. Qualitative data for actual factors.
3	Fonseca (2013)	2013	Portuguese CFW behaviour. Identify demographic characteristics	Questionnaire survey + in-depth interview	542 Portuguese citizens, 18 in-depth interviews	Portugal	35% is people who waste food: < 23 yrs., male, single. Rarely go to shop, use a car, no shopping list; do not separate waste, like promotions and impulse purchases, local market, eat meat, vegetables and fruits; pickiness, not aware of GHGs from FW, give leftovers to people and to their animals, usually buy fresh foods pre-	Demographic factors and FW.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
							packaged. 65% is non-FW group: 23 yrs and more, female, married or divorced, go frequently to shop with a list, separate waste, do not like promotions, read product labels, never shop at local market, rarely eat meat, have no habit of picking vegetables and fruits, aware of GHG from FW, utilise leftovers for a new menu, rarely buy fresh foods pre-packaged.	
4	Beretta et al. (2013)	2013	Quantify FL and reasons	Mass and energy flow analysis (22 food categories)	31 companies, institutions, associations	Switzerland	Food planning, storage of food are main reasons for FW.	More research is required to understand and solve the problem of FL.
5	Stefan et al. (2013)	2013 (2011)	Food choices, food activities and FW using TPB	Web-based questionnaire survey	244 Romanian consumers	Romania	Shopping/planning predict FW and determined by moral attitudes towards FW and PBC. Older, lower income consumers waste less food. Intention not to waste food has no significant effect on reported FW and is significantly explained by moral norms but not by subjective norms.	Improvement of adapted TPB model to predict CFW behaviour; should include motivation, skills, and food-related behaviours prior to disposal of food. Should include mediators e.g., resource-related factors. Environmental related messages and FW. Explore impact of culture on consumer FW.
6	Abeliotis et al. (2014)	2014 (2012)	Investigate knowledge and attitudes of Greek households about FW, main causes, influence economic crisis and FW generation	Questionnaire survey, face-to-face interview with the researchers. (self-report behaviour)	231 General public randomly selected in shopping areas, involved in food purchases and cooking at home	Greece	Main factor to cause FW = confusion of the date labels. Those who understand correctly, more educated	

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
7	Canali et al. (2014)	2014	Main causes of FW generation and roles of technology development, supply chain management, and consumer behaviour and lifestyles	Questionnaire survey	FUSIONS' experts		286 current causes of FW, 133 future threats, and 178 future possibilities of reduction. Group of drivers: technology, business management and economy, legislation, and consumer behaviour & lifestyle. FW has complex pattern.	
8	Farr-Wharton et al. (2014)	2014	Factors of CFW behaviour. Based on value-belief-norm theory)	1) a convergent interview, 2) Ethnographically inspired participant observations	12 participants for the interview, 6 households (17 individuals) for the observation	Australia	Supply knowledge, location knowledge, food literacy, bad experience in the past so did not want to eat if past best before date. 2 minor factors; unplanned events and no desire to consumer leftover food.	To investigate mitigation or reduction of FW.
9	Graham-Rowe et al. (2014)	2014 (2011)	Household FW minimisation behaviour	Interview	15 participants from 13 households from the South of England (students & non-students)	UK	Waste concerns, doing the "right" thing, food management, being a "good" provider, minimising inconvenience, lack of priority, exemption from responsibility.	Replicating the research using a larger stratified sample of the UK population. Relationship between motivations and barriers to reduce FW and demographic characteristics.
10	Tokareva and Eglite (2014)	2014 (2013)	Non-price related factors that influence CFW from both view of sellers and buyers. Solutions to reduce FW	Questionnaire (online)	610 Latvian people	Latvia	Most of FW is unavoidable. Higher income waste more food. Non-price factors: low awareness, storage, packaging, to buy list and meal planning, not understanding/ being not able to read labelling of the product. Latvian	

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
							consumers should be informed both at personal level and global level of negative impact of FW.	
11	Neff et al. (2015)	2015 (2014)	Awareness, attitudes, motivation, behaviours, retail & restaurant actions supported by consumers to reduce CFW	Online survey	1,010 A nationally representative online panel	The US	Milk: risk aversion, date labelling, freshness Banana: 40% brown, gender, household income. Effort to reduce FW no differences by age group. Motivation not to waste: save money, example for children, efficiency or guilt, not really about environment concern.	Specific types of food for FW, how much is reasonable to waste, and for specific purposes e.g., food safety. Drivers of incorrect perceptions of food safety. Shopping patterns and their influence. Cost of FW, cost of food per unit, and FW.
12	Graham-Rowe et al. (2015)	2015 (2012)	Drivers of household FW reduction. To test an extended TPB model to household FW reduction	Questionnaire survey	279 participants who were residents in the UK at the time of the study. 204 follow-up questionnaires	UK	Positive relationship between intention to reduce FW and household fruit and vegetable waste determined by attitude, subjective norm, and PBC. Additional variables increase the amount of variance in intention. No evidence that descriptive norms impact.	Replicate the research using different recruitment strategy, not revealing the aim of the study.
13	Joerissen et al. (2015)	2015	Household's food behaviours and the generation of FW Reasons for FW, measures and technologies most needed to prevent the waste	Online survey	857 People in scientific institutions (453 in Ispra and 404 in Karlsruhe)	Italy (Ispra) and Germany (Karlsruhe)	Top main reasons: 1) spoilage 2) not fresh, 3) smell/taste bad, and 4) mouldy. 5 least influence: 1) insufficient cooking skills, 2) date labelling, 3) served too much, 4) incorrect storage, 5) own preference. High income, a few household	Include more variety of consumers. Consider how to get people with different socio-demographic background involved.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
							members, not care about discount price waste more.	
14	Porpino et al. (2015)	2015	Drivers of CFW among middle class people	Observations, in-depth interviews, photographs, and a focus group discussion	Lower-middle income Brazilian households	Brazil	5 major reasons 1) excessive purchasing, 2) over-preparation or not cooking it properly, 3) caring for a pet, 4) not willing to eat leftovers 5) inappropriate preservation methods. Budget saving methods e.g., buy bulky pack. Don't want to be seen as poor, want to be a good provider. Some aspects are a part of culture: hospitality, good mother identity, taste abundance, wealth image.	Specify low-income group better because it's different from developed countries. Replicate this study in different regions, countries, income segments. Mixed methods and focus on specific variables.
15	Principato et al. (2015)	2015 (2012)	Youth's knowledge about FW, factors to change behaviour, planning shopping behaviour to prevent FW	Survey	233 students at Roma-Tre University in Italy (who study Economics)	Italy	Watching TV make them aware of economic and environmental problems from FW. Aware more about environmental aspect. People who already waste more are willing to change their behaviour more. Not willing to eat leftover food because it's not fresh and binning it will allow them to avoid risk of eating unsafe food (intervention needed). Gender and cost of food are not significant. Higher income less likely to try to reduce	Attitudes and behaviour change after being informed about FW and its impacts.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
							FW. People who acknowledge the problem of FW are more likely to make a shopping list. Income and gender do not affect making a shopping list. More than 1/3 thought environmental impact from packaging is greater than from FW.	
16	Secondi et al. (2015)	2015 (2011)	FW situation in EU and to develop a conceptual framework	Survey	Consumers in 27 EU countries	27 EU countries	Framework to examine FW behaviour at 1) individual level, 2) area level. Individual level: demographic, socio-economic characteristics and attitudes, habits and motivations related to the use of resource, waste and FW issues. Area level: economic, socio-cultural, industrial-productive, environmental characteristics of the country (area) in which the individuals reside. Individuals do not appear to be aware of the FW problems. Waste less: older, women, no job and job seekers, lower level of education, people in rural areas, people who are concerned about this problem, people who separate kitchen waste or recycle.	Harmonised definition of FW at EU level, consider cross-section nature of the study, a complete longitudinal analysis.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
17	Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Jenny (2015)	2015	Literature review on consumer behaviour research regarding FW, highlight research approach	Literature review and interviews	A structured review of 57 articles and reports (2004-2014 in English). 11 interviews with international experts	(Team of European researchers)	Most research in US and EU. Quantitative surveys, experiments, qualitative approaches. Environmental concerns, personal attitudes, appearance, FW VS packaging waste, good food provider, food knowledge, misunderstand label.	Explore certain areas in details, focusing on a specific target group, situation, food category, etc.
18	Connell et al. (2016)	2015	Suggest techniques parents can use to reduce FW and for child to have healthy diets	Comments from another research paper	Based on low income parents scenario	The US	Main factors: parent knowledge, increase children's involvement in cooking/growing veg, improve food appearance, depletion later in the day affects food choices. "Risk ladder": gradually give their children sweet fruits before moving to vegetables.	Role of social support and depletion.
19	Aschemann-Witzel, de Hooge, Amani, Bech-Larsen and Oostindjer (2015)	2015	Causes of CFW and potential methods to improve	Literature review + expert interview	11 Experts in FW and/or consumer behaviour	UK, Denmark, Italy, Sweden, the Netherlands	Lack of shopping plan, storage, food skills and knowledge, culture of consumerism and abundance, discount and low price, appearance, price-quality relation, risk aversion, dislike eating leftovers, taste, social and cultural background, difficulty visualising growth and production.	Focus on specific context, foods and segments, interventions.
20	Lanfranchi et al. (2016)	2016 (2015)	Obtain data at national level on the consumption and	Survey: Online questionnaire	500 Italian consumers from different families	Italy	FW behaviour is often an unreasoned action, no direct influence of norms	

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
			wasting habits of the households in the analysed area		who are responsible for household expenditure and food shopping		and social rules. Main cause of household FW: food remains in the fridge or freezer too long.	
21	Ellison and Lusk (2018)	2016 (2015)	Examine household FW decisions (economic)	Vignette, online questionnaire	More than 1,000 individuals in the US	The US	Demographic characteristics. FW is a function of raw food inputs, the wage rate, non-wage income, the overall time constraint, and the marginal productivities of raw food and time in producing meals.	Consider time spent shopping and preparing food, food appearance, number of days past expiry date, wage/non-wage income.
22	Stancu et al. (2016)	2016 (2012)	Effect of psycho-social factors, food-related routines, household perceived capabilities and socio-demographic characteristics on self-reported FW	Web-based survey, Questionnaires	1062 Danish respondents	Denmark	Main drivers of FW are PBC and routines related to shopping and reuse of leftovers. Factors affecting intention NOT to waste food are injunctive norms and attitudes towards FW. Moral norms and PBC make no significant contribution.	Intention is not a good predictor of behaviour. Self-report of FW is biased. Intention NOT to waste food or intention to waste food? Improving the reliability and validity of the measurement model.
23	Lazell (2016)	2016	CFW behaviour in a university setting and the implications for encouraging sharing for FW reduction	A mixed-method (survey, realist approach, semi-structured interviews, focus groups) study and a social media-based intervention	Students, academic and operations staff in a university in the West Midlands area of the UK	UK	Lack of experience in managing student loan funds, availability and timing of student loan funds, time-pressured environment, preference of freshness, appearance, lack of interaction with food in earlier stages.	Gap between motivations and their behaviour.
24	Block et al. (2016)	2016	To understand psychological background of FW	Draw on research in psychology and marketing	N/A	N/A	TPB is not enough to explain FW behaviour. Date label, waste reduction goal may	Emotional triggers that affect waste.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
			behaviour, root of FW problem.				conflict with self-regulatory objectives e.g., individuals attempting to control their diet etc	
25	Mallinson et al. (2016)	2016 (2015)	Levels of household FW and food management activities and attitudes to food consumption in relation to convenience food	Survey	928 UK residents (Young consumers in UK). Pre-specific criteria: having responsibility for most of the household food shopping, living in the UK, and aged between 18-40. From around the UK.	UK	1) Casual consumers and kitchen evaders were the most reliant on convenience food and the most wasteful. 2) Kitchen evaders are the second most wasteful, single person household, enjoy ready-meals and take-away, least interested in product information, least likely to plan ahead, lowest cooking skills, avoid cooking, snacking, don't have much kitchen equipment except microwave, the second highest ownership of microwave. 3) Casual consumers buy a lot, waste a lot (7.6% of food purchased). Most are female, living in a household of at least 2 people, like take-away food and ready-meals, most are likely influenced by advertisements, have picky eaters in the family, have a wide range of kitchen equipment, most likely own a microwave, moderate concern about	Subtle psychological and sociocultural factors.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
							discarding food. 4) Epicures are the least wasteful (discard 2.5% of total food purchased): have at least UG degree, highest overall household income, 1-2 people/ household, least likely to own microwave, mostly cooking from scratch. Household size, packaging, price-awareness, and marketing all influence levels of FW.	
26	Priefer et al. (2016)	2016	To provide detailed knowledge on drivers and reasons for FW	Literature review and analysis, EU based measures and regulations	N/A	EU countries	Market-based standards, non-compliance with food safety requirements, date labelling, consumer preferences and societal trends, lack of planning/knowledge concerning food purchase and storage, impulse purchases, change of preferences, inadequate package sizes, poor storage management, confusion about date labels, food preparation skills, poor meal planning, leftover handling skills. At catering stage: oversized, buffet, serve too much, difficulties in assessing demand, and EU hygiene rules.	To test regulations and measures to prevent FW from small scale to larger scale.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
27	Qi and Roe (2016)	2016	Relationship between US residents' *attitudes* and *awareness* about consumer FW and personal and household characteristics	Survey: computer-assisted interview (telephone). Use Spanish-speaking interviewers with Spanish households	US residents		3 principle components: 1) perceived practical benefits households may lose if FW were reduced 2) guilt 3) feeling what they could be doing more to reduce FW. Higher income, more about perceived private benefits. Guilt is the strongest attitude. Bin food if past the package's date to help reduce the chance of foodborne illness. Feeling guilt from wasting food (mostly by Asian respondents); deviation from a norm against wasting food, protecting environment as a norm, wasting food is wasting money; norms of household financial prudence. Their study cannot distinguish types of norms. They agree to the statement they waste more than neighbours with same income level.	Awareness of FW, feeling guilt, and meal safety and freshness.
28	Setti et al. (2016)	2016 (2013)	Relationships between consumers' income and household FW behaviour	Questionnaire: computer-aided web interviewing	1,403 Italian consumers, 5 food types: fresh bread, cheeses, yogurt, fresh vegetables and fruits	Italy	Consider FW frequency (not amount) and drivers. Mid-to-low income consumers purchase higher amounts of lower quality products and waste more food. For bread waste, higher in higher and lower income	

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
							group. Purchasing and preparing practices: with a reduced budget, consumers tend to buy cheaper products that can be bought in a large quantity. Eating behaviour: cheaper products, reduced quality (organoleptic related).	
29	Thyberg and Tonjes (2016)	2016	Review important background information on FW	Literature review		USA	Modernisation of food systems, industrialisation economic growth, urbanisation, globalisation, cultural factors, socio-demographic factors, policies driving FW generation.	
30	Tucker and Farrelly (2016)	2016 (November 2012-March 2013		Survey	147 Urban and suburb residents in Palmerston North, New Zealand	New Zealand	FW increases with increase of number of people in a household, number of younger people. Age 65 up most concerned about their household's environmental impact. The youngest group (18-24-year-old) the least concerned.	Lower socio-economic areas.
31	Delley and Brunner (2017)	2017 (2016)	Attitudes, perceptions and behaviours on the Swiss towards the household FW	Postal survey	681 German and French speaking Swiss residents	Switzerland	Point out significance of social norms and influence. 6 groups of consumers from cluster analysis: 1) the conservative (23.9%), the self-indulgent (7.5%), the short-termist (20.9%),	

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
							the indifferent (27.4%), the consumerist (14.1%), and the eco-responsible (6.2%). Different demographic, and reasons to avoid FW.	
32	Wilson et al. (2017)	2017	Develop an experiment to study the FW factors. Focus on date labelling	The auction (WTP and % expected consumption) + survey (demographic and food consumption habits)	200 non-student subjects at an experimental lab	The US	Different language on date labels would affect consumer's perception for FW. Date labels impact consumer behaviour and the value of the food intended to be wasted. The willingness to waste (WTW) is greatest in the "use by" treatment. The lowest for the "sell by" treatment.	Use of an incentive experiment method.
33	Lusk and Ellison (2017)	2017	Examine economic perspectives & FW	Based on Becker's household production model Becker (1965)	N/A	N/A	Market price of food raw material, wage rate (opportunity cost of time), individual characteristics (education, cooking ability).	
34	Russell et al. (2017)	2017 (2014-2015)	Examine consumer FW behaviour using TPB, the theory of interpersonal behaviour, the comprehensive model of environmental behaviour, and emotion	Survey - Asda's online customer panel	Individual customers at ASDA	UK	Age and gender are not significant. Subjective norms, and PBC positively affect intentions to reduce FW. Attitudes do not significantly affect the intention. The intention to reduce FW negatively related to FW behaviour. Significant positive relationship between habits of FW and FW behaviour. Negative emotions (e.g.,	Participant recruitment. Study more about emotions.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
							guilt) positively related with intentions to reduce FW. No significant relationship between positive emotions and intention. Negative emotions have a significant positive relationship with FW behaviour.	
35	Roodhuyzen et al. (2017)	2017	Framework and concepts of CFW	Systematic literature review	Articles from Scopus, Web of Science, and CAB Abstracts	N/A	4 main types of factors of consumer FW; 1. Behavioural factors 2. Personal factors 3. Product factors 4. Societal factors.	Validate and elaborate the proposed framework.
36	Canali et al. (2017)	2017	Identify main sources of FW	Literature review and expert focus group discussion		Europe	1) inherent characteristics of food; 2) social and economic factors; 3) individual behaviours;4) other priorities targeted different stakeholders; 5) diversified factors 2 types of consumer FW drivers: 1) drivers related to society; 2) drivers related to consumers.	
37	de Hooge et al. (2017)	2017	Product appearance and situation VS CFW	Online survey	4214 consumers from five Northern European countries	Denmark, Germany, Norway, Sweden, and the Netherlands	Situation (supermarket/at home), price (at supermarket), age, perceived quality.	Intervention, informed consumers, and how to prevent FW from these factors.
38	Richter and Bokelmann (2017)	2017 (2014)	Causes for storing, purchasing and wasting food	Household food diary, questionnaires	25 households in Germany	Germany	Food preparation is the most critical point for FW. The most common reasons: bought or cooked too much, date	Food handling habits, measures, information to be given.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
							labelling, sensory characteristics. Higher food traffic purchase much more food items, both for spontaneous purchases and planned purchases. Families with higher food expenditure.	
39	Ponis et al. (2017)	2017 (2014)	To investigate the effects of shopping habits on FW generation	Survey-questionnaire	500 Greek households	Greece	Eating preferences. Food portion and food management mediate the effect of shopping habits on FW. Food management mediates the effect of eating preferences on FW.	Consumers' awareness and behavioural change in the long term.
40	McCarthy and Liu (2017)	2017 (2016)	Attitudes of green consumers towards FW, reasons for wasting edible food and acceptance of policy actions	Survey	346 respondents	Australia	Fresh product with short shelf-life, spoilage, left in the fridge and forgot, prepared too much and did not use leftovers, "use by date" and "best before date". There was not a significant difference in FW behaviours between the organic and non-organic groups or between vegetarians and non-vegetarians. Some green consumers create a lot of FW. Different diet preference different attitudes; cost of FW, guilt, and negative emotions regarding FW. FW is primarily a social issue.	Actual levels of FW and compare green consumers with more mainstream consumers.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
41	Hebrok and Boks (2017)	2017	Intervention points for FW reduction	Literature review	Literature from Oria (Scopus, Web of Science and ACM Digital Library) and Google Scholar	N/A	Everyday routines and practices, culture and social norms, packaging, awareness, values, age, leftovers, lifestyle, product characteristics, planning, preferences, storage, portioning, knowledge, attitudes, abundance, infrastructure, food risk, value, convenience.	
42	Lorenz, Hartmann and Langen (2017)	2017 (2015)	CFW behaviour in a canteen	Observation and survey	343 university students	Germany	Leftover amount is low when intention to finish food is high, Intention to finish all food is determined by positive attitudes towards finishing all food, high PBC, subjective norms. Women left more food than men. Perceive smaller portion size, less waste. Palatability is highly important. Waste less if perceived palatability is high. No link between time pressure and food leftovers.	Portion sizes or campaigns.
43	Lorenz, Hartmann, Hirsch, et al. (2017)	2017	CFW behaviour based on TPB, personal norms, and situational factors	Survey-questionnaire	156 guests at a company canteen in the city of Cologne, Germany	Germany	High intention not to leave food, low plate waste. Personal norms and attitudes significantly drive consumers' intention to prevent leftovers. Subjective norms and PBC are less relevant. Personal norms significantly affect	Addition of situational variables.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
							attitudes and indirectly influence the intention. Taste has the greatest situational impact. Subjective norms do not have a significant impact on plate waste.	
44	Janssen et al. (2017)	2017 (2015)	Preservation methods VS FW generation in Dutch households	Online survey (NIPO Odin software of TNS NIPO)	506 Dutch households (that store foods in a freezer at least once per year.)	The Netherlands	Encouraging Dutch consumers to freeze certain foods more to reduce FW.	Measure actual amounts of FW.
45	Rohm et al. (2017)	2017 (2014-2017)	Reasons for FW of suboptimal food, strategies to promote consumption of this food, and how to implement	Focus group discussion and online choice experiment	83 consumers in 10 focus group discussion sessions (2 sessions/ country) and 4,214 consumers for the online choice experiment (800ish/country)	Denmark, Germany, Norway, Sweden, the Netherlands	Risk aversion, date on the packaging, appearance, lack of cooking food handling ability, family habits. Younger choose to consume/buy suboptimal food more. Price is a powerful tool to reduce ugly food at a store.	
46	Symmank et al. (2018)	2018	Visual exposure and food choice		233 student representatives of Technische Universität Dresden (140 male, 93 female), banana samples	Germany	Appearance (sensory perception).	Gender differences regarding suboptimal food choice. Research. Non-student participants and different food samples.
47	Aschemann-Witzel (2018)	2018 (2016)	Factors that influence acceptance of expiry date based on pricing of suboptimal food	Online survey experiment	842 Danish consumers	Denmark	Gender, age, familiarity with the FW reduction sticker and the store, communicating the FW	Relation between expiration date, price and perceived value. The real purchase situation and across a longer time frame.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
							motive x gender, perceived food quality	
48	Clark and Manning (2018)	2018	To investigate the factors that influence student awareness and FW behaviour	Semi-structured interviews, exploratory qualitative using NVivo 11	50 students from 12 rented households who were enrolled at a UK university	UK	No shopping list (43%) but those who cook as a household are better organised. Fail to stick to the list, special offers. Waste veg a lot. Cook too much and did not use in time. Fruit second, did not use in time. Milk third. Lack of freezer space. 46% don't want to eat leftover food. 50% know about shelf-life label and better FW behaviour. Waste fruit and veg because they are cheap and easy to buy new. More than half aware FW is environment problem but 22% concerns about packaging is more serious than FW. Social impact and environmental impact not strong.	Expand sample size of students.
49	Diaz-Ruiz et al. (2018)	2018 (2013)	To analyse consumer FW behaviour; food-related and waste management variables	Survey	418 consumers in Barcelona, Spain who were responsible for cooking or food purchase in their households	Barcelona, Spain	FW is directly influenced by purchasing habits, waste prevention habits and materialism values. High and committed waste prevention. behaviour influences, low FW generation. Good purchasing habits e.g., doing a shopping list or buying only what it is needed, lower FW	To include variables from both food and waste management. To explore more in cultural values such as materialism. To focus on "prevention".

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
							generation. Higher materialistic values, higher amount of FW. FW behaviour is indirectly influenced by environmental values. Not sure if recycling behaviour, price, and diet importance have an influence on FW behaviour.	
50	Lorenz and Langen (2018)	2018	To support a more general understanding about the determinants of individuals' food consumption behaviours in out-of-home settings that may be applied to increase sustainability in this sector and hence provide environmental change	Systematic literature review from 4 databases: AgEcon Search, PubMed Central, Science Direct and Web of Science from 2000 – 2017 in English. Search keywords in abstracts, titles and keywords or topic: "eating, food choice*, food preference*, FW, lunch, sustainability, sustainable" in pairwise combination with "away from home, cafeteria*, canteen*, food service* and restaurant*" as well as "food leftover*", "plate waste", "dining out" and "eating out" in general	N/A	Germany	Product factors, behavioural factors, demographic, economic factors.	
51	Stangherlin and de	2018	To find main causes of food waste and what	Systematic literature review	N/A	N/A, researchers	1) Societal factors 2) Personal factors	

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
	Barcellos (2018)		prevents it from being reduced at the consumption level.			are from Brazil	Behavioural factors	
52	Mirosa, Liu, et al. (2018)	2018	To discover barriers and benefits of behaviour of taking leftover food away and show possible campaign to encourage doggy bags	2 stages: first: quantitative survey data and second: qualitative FGD (restaurant and café setting)	NZ consumers over 18 years old who had dined in a restaurant or a café at least once in the past month. Did not include people who worked in the hospitality industry. Qualtrics data collection. SPSS data analysis. 3 FGDs in Dunedin, NZ. Had to be over 18, had eaten in a restaurant or a café in the past month. 40-60	New Zealand	Not taking leftovers home because of not enough to take away. Don't know if the restaurant offered doggy bags, not convenient, young participants in FGD had low level of awareness about availability of doggy bags. "saving money" can motivate consumers to take the leftovers home. Restaurant staff didn't ask if diners want to take food away.	Behavioural change strategies.

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
					mins per session. Participant profile is quite different between the two studies. FGD mainly represented by young students.			
53	Chakona and Shackleton (2017)	October-November 2014	Examine household CFW behaviour and quantify FW recalling about the past 48 hours.	Questionnaires with face-to-face interview, recorded and measured FW created in the past 48 hours before the interview.	Random households (200 houses each town: 60 urban, 80 semi urban, 60 urban). Actual number: 183, 173, 198 households in three towns	South Africa (3 medium-sized states)	People always eat meals at home together with their family, rarely had meals separately and out of home. Rarely left food uneaten, rarely thrown away leftovers, keep for later and eat within a day or two. Rarely give the food to other people or feed animals. Mostly throw away prepared meals > unprepared? Drinks. Urban household significantly waste prepared food and drink more than semi-urban and rural. No significant for unprepared food. Still urban people thrown away more often.	
54	Aschemann-Witzel et al. (2019)	November – December 2017	Explored self-efficacy as it is applicable to consumer household FW and applied the	Mixed method: quantitative analysis based on online experimental survey, recruited via	540 Uruguayan participants from the 1039 respondents.	Uruguay	Can't confirm that convenience orientation increases food waste. Good provider identity is found to have	

DETERMINANTS FOR DECISIONS TO WASTE FOOD								
No.	**Studies**	**Year (study)**	**Aim**	**Methods**	**Sample**	**Country**	**Outcome**	**Suggestion**
			suggested cascading nature of the concept.	Facebook and qualitative analysis			an effect on food waste. good provider identity appears to further the tendency to choose convenience food, instead of lessening it. Older people are less likely to engage in food waste, except for social eating incidents; offering plenty of food to guests is a normative practice in Latin America. Unclear effect of having children in household on FW. No barrier to avoid FW and to prevent is to serve the right amount.	
55	Soma (2019)	2015	employs practice theory to better understand the role of planning and infrastructure in food provisioning and food wasting practices	Face-to-face surveyed 323 hh (upper (n = 62), middle (n = 107) and lower (n = 154) income households), qualitative study with 21 hh.		Indonesia	higher incomes are increasingly shopping at modern supermarkets, it is difficult to disentangle the extent to which waste is attributable to income or retail outlet choice. FW because consumers forget food in the fridge. There are cultural and traditional beliefs to not waste food (rice will cry) (similar to Thai beliefs) but it does not guarantee that consumers won't waste food. Giving leftovers to others is normal	Urban food waste, spatial determinants and material infrastructure

Appendix 2 - In-depth Interview - Ethical Clearance

School of Agriculture, Policy and Development

✓ ETHICAL CLEARANCE GRANTED
School of Agriculture Policy and Development

University of Reading

Form 2. MSc PhD Staff Ethical Clearance Submission Form

PLEASE allow a minimum of 3 weeks for this process.
You must not begin your research until you have obtained consent as evidenced by this form returned from the APD student Office signed and dated. Ethical Clearance cannot be granted retrospectively.

This form can only be used if the application :

- Does not involve participants who are patients or clients of the health or social services
- Does not involve participants whose capacity to give free and informed consent may be impaired within the meaning of the Mental Capacity Act 2005
- Does not involve patients who are 'vulnerable'
- Does not involve any element of risk to the researchers or participants
- Does not involve any participants who have a special relationship to the researchers/investigators

If any of the above apply, please refer to the APD Ethics Chair to decide whether an application can be made through the APD review process or whether the application needs to be referred to the full University Committee.

It is the applicant's responsibility to check for any particular requirements of a funder regarding ethical review. Some funders may require that the application is reviewed by full University Committee and not the devolved School committee.

Full details of the University Research Ethics procedures are available at http://www.reading.ac.uk/internal/res/ResearchEthics/reas-REethicshomepage.aspx and you are encouraged to access these pages for a fuller understanding. Some helpful advice is available on this link http://www.reading.ac.uk/internal/res/ResearchEthics/reas-REwhatdoIneedtodo.aspx and the FAQs are particularly relevant.

ALL QUESTIONS MUST BE COMPLETED.

APD Ethical Clearance Application Reference Number : Click here to enter text.

1. **APPLICANT DETAILS:**

Main applicant name:	Ponjan Pinpart
Name of academic supervisor/project investigator:	Prof. Kelvin Balcombe
Email Address (decision will be emailed here):	Ponjan.pinpart@pgr.reading.ac.uk
MSc Student	☐
PhD Student	☒
Staff Member	☐
Other (please specify)	Click here to enter text.

2. **PROJECT DETAILS:**

Title of project: Bite it or bin it: Do we care about what other people think?: An investigation into norms in relation to consumer food waste

Please provide a lay summary of the project, including what is being investigated and why: This research project aims to find what norms in relation to consumer food waste are. It also aims to compare those norms between groups of people and to study the relationship between food appearance of food consumption norms. Perception of food waste behaviour and perception of other people's opinion towards food waste are to be investigated. This is because consumer food waste is becoming a serious problem and behavioural aspects are one of the main causes. Investigating social norms will help us understanding why consumers waste food.

Procedure. Please outline the project's research protocol (what procedures, research methods and analysis methods are being used) : Interview and questionnaire survey are research tools for this research project. The data collection will start with this in-depth interview attached in this document before moving onto the survey session for

which the questionnaires are based on the results of this in-depth interview. In particular, this in-depth interview data will be conducted in Thailand and the interview is one-to-one between the researcher and participant. The result will be thematically analysed and keywords are collected. Answers will be grouped into main categories and descriptive statistics will be used. The results will be used to create a futher questionnaire set for the survey, which will be submitted for the ethical clearance afterwards. This survey will be conducted to collect consumer's opinion and the results will be statistically and mathematically analysed using a logistic model and descriptive statistic.

Period over which the data collection is to be undertaken (note: data collection CANNOT commence until ethical approval has been granted as evidenced by this form signed and returned).

Proposed Start Date: 10/11/2017
Proposed End Date: 20/11/2017

3. THE RESEARCH:

a) **Nature and number of participants** who are expected to take part in your survey/focus group. Please estimate if uncertain. As ethical clearance involving minors is more complex because of safeguarding and consent issues, please consider carefully whether you need to involve minors under the age of 16 in your research.

Participants	**Number participating**
Minors under 16 years of age	Click here to enter text.
Students	Click here to enter text.
Other members of the University	Click here to enter text.
Members of the general public	As many as I can but at least 20 participants
Businesses	
Government officials	Click here to enter text.
Other *If other please specify:*	Click here to enter text.

b) **Funding.** Is the research supported by funding from a research council or other external sources for example a charity or business?

Yes ☐ If yes, please specify funder : Click here to enter text.
No ☒

If yes, it is the responsibility of the applicant to check for any particular requirements of the funder regarding ethical review. Some funders may require that the application is reviewed by full University Committee and not the devolved School committee.

c) **Recruitment.** Please describe recruitment procedures. How have participants been selected? Are there any inclusion/exclusion criteria? Participants must be told on the Participant Information Sheet how and why they have been selected. You should attach ay recruitment materials to this application. Participants are Thai people and are recruited by using the snowball sampling. The first couple of subjects are based on researcher's social networks and acquaintances. They will be restaurant or café owners or managers who have a managerial position. Furthermore, they must have responsibility about food acquiring and managing at home either for themselves or for their family members. The first contact will be done mainly by email correspondings asking if they are interested in taking part of this interview and asking for suggestion of further participants who can join the interview.

d) **Exceptions.** Does the research involve minors, medical patients, individuals with learning difficulties, vulnerable adults, participants recruited through social service departments, or anyone in a special relationship with yourself/data collectors? E.g. Supervisor; lecturer to a group of students; or person in a position of responsibility for participants.

Yes ☐
No ☒

If yes, this may result in referral to the University Research Ethics Committee (please note their deadlines). Please provide extra detail here: Click here to enter text.

e) **Where is the data collection to be undertaken?** Specify country(ies) and specific location(s) Bangkok, Thailand. The interview will be conducted in public business areas such as in restaurants and food shops.

f) **What forms of data collection does the research involve?**

Group discussion/ workshop	☐
Personal interviews	☒
Telephone interviews	☐
Questionnaire/paper survey	☐
Postal survey	☐
Email/ online survey	☐
Which software tool will be used, if any?	NVIVO, SPSS
Other *(specify)*:	Click here to enter text.

g) **Who will undertake the collection and/or analysis of data?**

Myself	☒
Other MSc students	☐
Other Higher degree students	☐
Other contract research and/or academic staff	☐
Individuals outside University	☐
External organisations	☐

If individuals outside the University and/or external organisations are involved in the collection or analysis of data, give brief details below. Indicate how the ethical procedures and standards of the University will be satisfied: Click here to enter text.

h) **Does the research require participants to consume any food products?**

No	☒
Yes	☐

If yes, please provide full details and indicate measures in place to ensure excellent food hygiene standards and ensure participant safety. Click here to enter text.

i) **Do you consider there are any potential ethical issues in this project? Does the research require collection of information that might be considered sensitive in terms of confidentiality, potential to cause personal upset, etc.?**

No	☒
Yes	☐

If yes, please provide full details and indicate how these issues will be addressed, how researchers will manage participant reaction. Support and de-brief sheets should be attached if relevant. Click here to enter text.

j) **Will the research involve any element of intentional deception at any stage?** (i.e. providing false or misleading information about the study, or omitting information)?

No	☒
Yes	☐

If yes, this must be justified here. You should also consider including debriefing materials for participants which outline the nature and justification of the deception used. Click here to enter text.

k) Are participants offered a guarantee of anonymity and/or that the information they supply will remain confidential?

Yes ☒
No ☐

If yes, give brief details of the procedures to be used to ensure this and particularly if the data has 'linked' or 'keyed' anonymity (eg. where published results are anonymous but participant details are recorded and held separately to the responses but keyed with reference number) : Personal details, e.g. name and contact details, are not collected. Participant information sheet will be provided as well as reference number that is only linked to a specific set of answer that his or her gives. Contact details of myself will be provided in this sheet in case participants would like to contact for further details or to withdraw from the research. Published results will be anonymous.

l) Will participants be required to complete a separate consent form? Many APD applications do not require participants to complete a separate consent form. Please see the templates provided.

☐ Yes. Names, addresses and copies of completed forms will be given to APD student office
☒ No. The data collection is anonymous and a combined information/consent sheet supplied
☐ Neither of the above, or the research involves participants under the age of 16

If 'neither of the above' selected, or the research involves participants under the age of 16, please outline the specific circumstances. Click here to enter text.

m) Will participants be offered any form of incentive for undertaking the research?

No ☒
Yes ☐

If yes, give brief details, including what will happen to the incentive should the participant later withdraw their input or decide not to proceed : Click here to enter text.

4. DATA PROTECTION

Data Storage, data protection and confidentiality. Please make sure you are familiar with the University of Reading's guidelines for data protection and information security. http://www.reading.ac.uk/internal/imps/

Please outline plans for the handling of data to ensure data protection and confidentiality. Covering the following issues: Will any personal information be stored? How and where will the data be stored? Who will have access to the data? When will it be deleted?

I will not collect any names or personal details as part of the survey. Particfipant's identity will not be revealed to anyone other than myself. Participation is entirely voluntary and they are free to withdraw from the survey at any time they feel uncomfortable or unwilling to participate, and they do not have to specify a reason. Any in-part or total contribution can be withdrawn up until the point at which the data is aggregated before 31st January 2020. If they wish to withdraw, they can contact me, contact details provided, quoting the reference at the top of the first page of the participant information sheet. The reference will only be used to identify your questionnaire transcript and will not reveal any other information about you.
If at any stage they wish to receive further information about this research project, they can contact me before 31st December 2020. This will not affect your anonymity. All data I collect will be stored securely electronically on a password-protected computer or in hard copy version in a locked cupboard. The data will be destroyed at the end of the research project no later than 31st December 2020.

Applicants: Please now scroll to Section 7 to input your :

- Information Sheet(s) for Participants (mandatory)
- Data Collection Tools, for example: recruitment materials, interview/focus group protocols (how you are conducting the process), interview/focus group questions, questionnaires, online survey questions, debriefing and fact sheets
- Consent Forms (optional, may not be necessary if consent assumed in Information Sheet)

5. Supervisor/project investigator review. Section to be completed by supervisor/PI where relevant.

Participant information sheet(s), data collection tools and any other supporting information may be pasted in section 7 below. Alternatively they may be attached to this email. Please review these documents and then complete the checklist below.

Checklist. Does this application and supporting documents adequately address the following ?

- ☒ The safety of the researcher(s) and those collecting data, the safety of the participant(s)
- ☒ Is the language /grammar/content appropriate (i.e. University standards and reputation upheld)
- ☒ There are no questions that might reasonably be considered impertinent or likely to cause distress to the participants
- ☒ The researcher has provided the participant information sheet (mandatory)
- ☒ The researcher has provided the questionnaire or survey/ workshop, focus group or interview questions (mandatory)
- ☒ The Participant Information Sheet gives sufficient information for the participants to give their INFORMED consent
- ☐ A separate consent form has been included (optional)
- ☒ Data will be handled, stored and deleted appropriately according to University guidelines, and the participants have been adequately informed about this in the Participant Information Sheet
- ☒ The Participant Information Sheet contains all relevant sections

- ☒ **I am satisfied that this application meets the minimum standards for APD Ethical Clearance to be granted**

Supervisor/Project Investigator, please forward this form as a WORD document and any separate supporting documents to sapdethics@reading.ac.uk. The form will be logged by the student office and allocated to an APD ethics committee reviewer. The APD ethics reviewer will review the application and complete section 6.

6. APD ethics committee review. Section to be completed by APD Ethics Committee member.

Decision

Clearance refused		☐	Resubmission required
Clearance granted as presented	☒		
Clearance granted subject to revisions suggested		☐	No need to resubmit once amended
Referred to APD Research Ethics Chair		☐	May require further information

Ethics Committee Member please enter comments, reasons for rejection, summary of revisions required before proceeding (if applicable):

Click here to enter text.

Committee Member Name: GIACOMO ZANELLO **Date Reviewed :** 21/10/2017

Appendix 3 - In-depth Interview - Questions (English and Thai)

PARTICIPANT INFORMATION SHEET

Reference number:	

Introduction

I am a PhD student at the University of Reading, School of Agriculture, Policy, and Development. This interview forms part of my thesis which will contribute to my degree.

About this research

My research aims to gain basic understanding about food waste in a restaurant and perception about Thai people's food waste behaviour when eating out.

About this interview

I would like to ask for your thoughts about Thai people's food waste behaviours, when we throw away food and when we leave food on your plates. We are currently contacting you a restaurant or a food café and ever cook and buy food products by yourselves and ever eat out. This interview will take approximately 20-30 minutes of your time. You are encouraged to freely express your opinions and please be assured that your views are valued and that there are no right or wrong answers to the questions asked.

How I select you?

I select my participants for this survey via my social networks and acquaintances by Facebook messages. People of any age and level of education can take part as I am interested in answers of people from different background.

Confidentiality, storage, and disposal of information

I will not collect any names or personal details as part of the survey. Your identity will not be revealed to anyone other than myself. Participation is entirely voluntary, and you are free to withdraw from the survey at any time you feel uncomfortable or unwilling to participate, and you do not have to specify a reason. Any in-part or total contribution can be withdrawn up until the point at which the data is aggregated before 31st January 2020. If you wish to withdraw, please contact me, Ponjan Pinpart (Prau) (details below), quoting the reference at the top of the first page of this information sheet. The reference will only be used to identify your questionnaire transcript and will not reveal any other information about you.

If at any stage, you wish to receive further information about this research project please do not hesitate to contact me before 31st December 2020. The findings will be written up into my thesis as part of my degree. This will not affect your anonymity.

All data I collect will be stored securely electronically on a password-protected computer or in hard copy version in a locked cupboard. The data will be destroyed at the end of the research project no later than 31st December 2020.

By completing this survey, you are acknowledging that you understand the terms and conditions of participation in this study and that you consent to these terms.

This research project has been reviewed according to the procedures specified by the University Research Ethics Committee and has been given a favourable ethical opinion for conduct.

Thank you very much for taking time to take part in this survey!

Ponjan Pinpart (Postgraduate Research Student)

Student Contact Details
School of Agriculture, Policy and Development
Agriculture Building
Earley Gate, Whiteknights Road
PO Box 237
Reading RG6 6AR
United Kingdom
Phone: +44 (0)[redacted]
E-Mail: ponjan.pinpart@pgr.reading.ac.uk

Supervisor Contact Details
Prof. Kelvin Balcombe
Tel: +44 (0)[redacted]
E-mail: k.g.balcombe@reading.ac.uk

General

1. What is your general perception about food waste in Thailand??
    - Other possible questions: Do they waste a lot? Do you waste a lot?
2. What would you do and how would you feel if you see other people bin food that is still edible?
    - Other possible questions: Don't care? Disapprove? What would you do?

Meal Consumption and Table Manner

3. Do you think everyone should finish food on our plate and why?
4. For you, finishing food on your plate shows good or bad manners? And why?
5. What are the main reasons when people cannot or will not eat all the food you are served?
6. What do people normally do if they have some food left on your plate?
    - Other possible questions: How do you feel when people ask for taking leftover food away?
7. What would you do and how would you feel if you see someone leave food on their plates?
8. Do some people have any meal preference?

THANK YOU

เอกสารข้อมูลสำหรับผู้เข้าร่วมตอบคำถามสัมภาษณ์

หมายเลขอ้างอิง:	

บทนำ:

ดิฉัน นางสาวพรจันทร์ พิณพาทย์ เป็นนักศึกษาระดับปริญญาเอก คณะ การเกษตร, นโยบาย, และการพัฒนา มหาวิทยาลัยเรดดิ้ง สหราชอาณาจักรการสัมภาษณ์และผลสัมภาษณ์นี้จะเป็นส่วนหนึ่งของวิทยานิพนธ์ของดิฉันซึ่งเป็นส่วนหนึ่งของงานวิจัยสำหรับปริญญาเอกนี้

เกี่ยวกับงานวิจัย:

งานวิจัยของดิฉันมีจุดประสงค์ที่จะทำความเข้าใจผู้บริโภคถึงสิ่งที่คิดว่าเหมาะสม และไม่เหมาะสมในการทิ้งอาหารที่ยังสามารถรับประทานได้ ดิฉันต้องการค้นหาว่าผู้บริโภคคิดอย่างไรในการทิ้งขว้างอาหารไม่ว่าจะเป็นการรับประทานภายในบ้านเรือนหรือเมื่อรับประทานอาหารนอกบ้าน นอกจากนี้ งานวิจัยนี้ยังต้องการหาผู้บริโภคแต่ละท่านคิดว่าท่านอื่นๆคิดเห็นกันอย่างไร

เกี่ยวกับการสัมภาษณ์นี้:

ในการสัมภาษณ์นี้ดิฉันจะทำการสอบถามถึงความคิดเห็นของท่านเกี่ยวกับอาหารที่ทิ้งไปเป็นขยะ และเศษอาหารเหลือทิ้ง, ทัศนคติของท่าน เกี่ยวกับรูปลักษณ์ภายนอกของอาหาร,พฤติกรรมของท่านในการทิ้งเศษอาหารและการทานอาหารเหลือ เราได้ทำการติดต่อท่านในฐานะที่เป็นผู้บริโภคที่เป็นเจ้าของหรือผู้จัดการร้านอาหารหรือคาเฟ่ และเคยทำอาหารและซื้อสินค้าอาหารด้วยตัวท่านเอง เคยรับประทานอาหารนอกบ้าน การสัมภาษณ์นี้จะใช้เวลาประมาณ 20 นาที คำตอบไม่มีถูกหรือผิด ดังนั้นท่านสามารถแสดงความเห็นของท่านได้เต็มที่ค่ะ

การเลือกผู้เข้าตอบคำถามสัมภาษณ์:

ดิฉันทำการรับสมัครและเลือกผู้เข้าร่วมตอบคำถามสัมภาษณ์โดยการส่งอีเมล์หาคนที่รู้จักเพื่อนที่ทำงานและใช้ช่องทางข้อความในสื่อโซเชียลมีเดียติดต่อเพื่อนเพื่อแนะนำให้รู้จักกันผู้ที่เข้าข่ายตามที่ต้องการของงานวิจัยดังที่กล่าวไปแล้วข้างต้น เนื่องจากดิฉันต้องการข้อมูลที่หลากหลาย จากผู้เข้าร่วมที่มาจากพื้นเพแตกต่างกัน ดังนั้นผู้ที่มีอายุ เชื้อชาติ และระดับการศึกษาใดๆก็ตาม ก็สามารถเข้าร่วมตอบคำถามได้

ความลับของข้อมูล, การเก็บข้อมูล, และการกำจัดข้อมูล

ในการสัมภาษณ์นี้ดิฉันจะไม่ทำการสอบถามและเก็บข้อมูลชื่อและข้อมูลส่วนตัวของท่านความเป็นตัวตนของท่านจะถูกเก็บเป็นความลับและไม่ถูกเปิดเผยกับคนอื่นนอกจากตัวของดิฉันการเข้าร่วมสัมภาษณ์นี้เป็นการเข้าร่วมแบบอาสาสมัครและด้วยความสมัครใจแต่หากท่านต้องการจะถอนตัวออกจากการสัมภาษณ์นี้เมื่อท่านรู้สึกไม่สะดวกหรือรู้สึกไม่เต็มใจที่จะเข้าร่วมโดยที่ท่านไม่จำเป็นต้องอธิบายสาเหตุหากท่านต้องการจะถอนบางส่วนหรือทุกส่วนในการให้คำสัมภาษณ์นี้ก็สามารถทำได้จนถึงวันที่ 31 มกราคม 2563 หากท่านต้องการยกเลิก หรือ ถอนข้อมูลที่ท่านได้ให้สัมภาษณ์ไว้นั้นท่านสามารถติดต่อดิฉันตามช่องทางการติดต่อที่แจ้งไว้ด้านล่างนี้โดยแจ้งหมายเลขอ้างอิงที่อยู่บนมุมขวาของเอกสารนี้ หมายเลขอ้างอิงนี้ใช้เป็นตัวชี้ข้อมูลที่ท่านให้เท่านั้นไม่ได้สื่อถึงตัวตนหรือข้อมูลส่วนตัวของท่านแต่อย่างใดสุดท้ายแล้วบทสัมภาษณ์นี้จะใช้เป็นข้อมูลในธีสิสของดิฉันโดยไม่กระทบต่อความนิรนามของท่านในการตอบสัมภาษณ์นี้แต่อย่างใด ข้อมูลที่ท่านให้สัมภาษณ์นั้นจะถูกเก็บเป็นข้อมูลอิเล็คทรอนิกในคอมพิวเตอร์ที่ใส่รหัสผ่านป้องกันและเก็บเป็นเอกสารในชั้นเก็บเอกสารที่มีกุญแจล็อคข้อมูลทั้งหมดนี้จะถูกทำลายหลังจากงานวิจัยเสร็จสิ้นไม่เกินวันที่ 31 ธันวาคม 2063การที่ท่านตอบคำถามสัมภาษณ์นี้จนจบสิ้นถือว่าท่านรับทราบ และยินยอมตามข้อตกลงดังกล่าวข้างต้นงานวิจัยนี้ได้รับการทวนสอบตามกระบวนการที่เกี่ยวข้องตามมนโยบายของมหาวิทยาลัยและผ่านการตรวจสอบโดยคณะกรรมการมนุษยธรรมและศีลธรรมของมหาวิทยาลัยซึ่งได้ให้ข้อคิดเห็นที่เป็นประโยชน์ต่อการดำเนินการวิจัยให้เป็นไปตามหลักศีลธรรม ดิฉันขอขอบพระคุณทุกท่านเป็นอย่างยิ่งที่ได้สละเวลาในการร่วมตอบคำถามสัมภาษณ์นี้

นางสาวพรจันทร์ พิณพาทย์ (นักศึกษาปริญญาเอก)

ช่องทางการติดต่อนักศึกษา

ที่อยู่: School of Agriculture, Policy and Development

Agriculture Building

Earley Gate, Whiteknights Road

PO Box 237, Reading RG6 6AR

United Kingdom

เบอร์โทรศัพท์: +44 (0) [redacted]

อีเมลล์: ponjan.pinpart@pgr.reading.ac.uk

รายละเอียดอาจารย์ที่ปรึกษา

ชื่อ: Prof. Kelvin Balcombe

โทร: +44 (0) [redacted]

อีเมลล์: k.g.balcombe@reading.ac.uk

ทั่วไป

1. มีความเห็นอย่างไรเกี่ยวกับขยะอาหาร ความคิดเห็นโดยทั่วไทยเกี่ยวกับสถานการณ์ในประเทศไทย
    - คำถามอื่นๆ: คนไทยทิ้งอาหารกันเยอะมั้ย? แล้วท่านละ
2. ท่านจะทำอย่างไร และจะรู้สึกอย่างไรเวลาเห็นคนอื่นทิ้งอาหารทั้งๆที่ยังกินได้
    - คำถามอื่นๆ: ไม่สนใจ? ทำแบบนั้นไม่ได้? ท่านจะทำยังไง?

ในสถานการณ์มื้ออาหาร

3. ท่านคิดว่าทุกคนควรกินอาหารให้หมดจานหรือไม่ เพราะอะไร
4. สำหรับท่านการกินอาหารหมดจานถือว่าดีหรือไม่ เป็นมารยาทที่ไม่ดีหรือไม่ เพราะอะไร
5. สำหรับท่านอะไรคือสาเหตุสำคัญเวลาที่คนกินอาหารไม่หมดจาน
6. คนส่วนใญ่มันทำยังไงเวลามีอาหารเหลือบนจาน
    - คำถามอื่นๆ: ท่านรู้สึกยังไงเวลามีคนขออาหารเหลือใส่กล่องกลับบ้าน
7. ท่านทำยังไง หรือรู้สึกยังไงเวลามีคนมีอาหารเหลือบนจาน
8. คนส่วนมากมีความชอบในอาหารอะไรเป็นพิเศษ กินไม่กินอะไรเป็นพิเศษหรือไม่

ขอบพระคุณอย่างสูง

Appendix 4 - In-depth Interview - An Example of Thai Questionnaire Survey Language Validation

กรุณาใส่คะแนน +1, 0 หรือ -1 โดยที่

+1 หมายถึง ข้อคำถามนั้นมีคำเขียนที่ถูกต้อง เข้าใจได้ง่ายโดยผู้บริโภคเป็นอย่างดี, 0 หมายถึง ไม่แน่ใจ หรือตัดสินใจไม่ได้, -1 หมายถึง ข้อคำถามนั้นมีคำเขียนไม่ถูกต้อง หรือไม่น่าจะถูกต้อง หรือไม่สามารถเข้าใจได้ง่าย และถ้ามีประโยคภาษาไทยแนะนำรบกวนใส่ที่ช่องขวามือสุด

English	ไทย	คะแนน	ประโยคแนะนำ
Do you commit to providing your thoughtful and honest answers to the questions in this survey?	ท่านจะสามารถช่วยเราโดยการให้ความเห็นที่แท้จริงของท่านอย่างตรงไปตรงมาได้หรือไม่	0	ท่านยินยอมที่จะตอบคำถามตามความคิดเห็นที่แท้จริงอย่างตรงไปตรงมาได้หรือไม่
Imagine you just finished eating dinner alone at home. The meal cost about 100 Baht per person. You're full, but there is still food left on the table – enough for a half lunch tomorrow. Assuming you don't have meals planned for lunch and dinner tomorrow.	ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่บ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะเพียงพอสำหรับเป็นมื้อกลางวันพรุ่งนี้ได้เลยครึ่งหนึ่ง สมมติว่าท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นพรุ่งนี้	+1	ท่านเพิ่งรับประทานอาหารเย็นเสร็จ คนเดียวที่บ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ**ซึ่ง**เพียงพอสำหรับเป็นมื้อกลางวันพรุ่งนี้ได้**เลย**ครึ่งหนึ่ง สมมติว่าท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็น**วัน**พรุ่งนี้
Wasting food would make me feel guilty about other people who do not have enough food to eat.	เวลาที่ต้องทิ้งของกินนั้นฉันมักจะรู้สึกผิดต่อคนอื่นที่ไม่มีอาหารพอกิน	0	การทิ้งอาหารทำให้ท่านรู้สึกผิดต่อผู้ที่ไม่มีอาหารเพียงพอที่จะรับประทาน
Wasting food would make me feel guilty about food producers who produce food for me.	เวลาที่ต้องทิ้งของกินนั้นฉันมักจะรู้สึกผิดต่อคนที่ผลิตอาหารมาให้ฉันกิน	0	การทิ้งอาหารทำให้ท่านรู้สึกผิดต่อผู้ผลิตอาหาร
Wasting food would make me feel guilty about the environment.	เวลาที่ต้องทิ้งของกินนั้นฉันมักจะรู้สึกผิดต่อสิ่งแวดล้อม	0	การทิ้งอาหารทำให้ท่านรู้สึกผิดต่อสิ่งแวดล้อม
Wasting food would give me a bad conscience.	เวลาที่ต้องทิ้งของกินนั้นฉันมักจะรู้สึกแย่ในแง่ความผิดชอบชั่วดี	0	การทิ้งอาหารทำให้ท่านรู้สึกแย่ในแง่ความผิดชอบชั่วดี
Most people who are important to me think that one should…	คนที่มีความสำคัญสำหรับฉันส่วนใหญ่มักคิดว่าคนเราควรที่จะ....	0	คนส่วนใหญ่ที่มีความสำคัญสำหรับฉันมักคิดว่าคนเราควรที่จะ
I think one should….	ฉันคิดว่าคนเราควรที่จะ….	+1	
…never waste food in each meal.	…ไม่ปล่อยให้มีอาหารเหลือทิ้งเลยในแต่ละมื้อ	+1	

… reuse leftover food.	...เอาอาหารที่เหลือมาใช้หรือทานต่อได้	+1	...เอาอาหารที่เหลือมาใช้หรือ**รับประทาน**ต่อได้
… not load the environment with food waste from meals.	...ไม่เอาอาหารเหลือทิ้งจากแต่ละมื้อมาเป็นภาระต่อสิ่งแวดล้อม	+1	
My happiness depends very much on the happiness of those around me	ความสุขของฉันขึ้นอยู่กับความสุขของคนรอบตัวฉันเป็นอย่างยิ่ง	+1	
I would do what would please my family, even if I detested that activity	ฉันทำในสิ่งที่ทำให้ครอบครัวของฉันพึงพอใจถึงแม้ว่าฉันจะไม่ได้ชอบทำสิ่งนั้นก็ตาม	+1	ฉัน**จะ**ทำในสิ่งที่ทำให้ครอบครัวของฉันพึงพอใจถึงแม้ว่าฉันจะไม่ได้ชอบทำสิ่งนั้นก็ตาม
I usually sacrifice my self-interest for the benefit of my group	ฉันมักจะยอมแลกสิ่งที่ฉันชอบ สิ่งที่เป็นความสนใจของตัวฉันเองเพื่อได้มาซึ่งผลประโยชน์ของกลุ่ม	-1	ฉันยอมแลกสิ่งที่ฉันชอบและสนใจเพื่อให้ได้มาซึ่งผลประโยชน์ของกลุ่มเสมอ
I enjoy working in situations involving competition with others	ฉันสนุกกับการทำงานในสภาพแวดล้อมที่ต้องแข่งขันกับผู้อื่น	+1	
The well-being of my co-workers is important to me	ความเป็นอยู่ของผู้ร่วมงานมีความสำคัญสำหรับฉัน	+1	
I enjoy being unique and different from others in many ways	ฉันชอบที่จะมีเอกลักษณ์และแตกต่างจากผู้อื่นในหลายๆด้าน	+1	
Children should feel honoured if their parents receive a distinguished award	ลูกๆควรรู้สึกเป็นเกียรติเวลาพ่อแม่ได้รับรางวัลอันโดดเด่น	+1	
I often “do my own thing”	ฉันมักจะทำอะไรในแบบของฉันเอง	+1	
Competition is the law of nature	การแข่งขันนั้นเกิดขึ้นตามกฎของธรรมชาติอยู่แล้ว	+1	
If a co-worker gets a prize, I would feel proud	ถ้าผู้ร่วมงานได้รับรางวัลฉันจะรู้สึกภูมิใจ	+1	ถ้าผู้ร่วมงานได้รับรางวัลฉันจะรู้สึก**ภาค**ภูมิใจ
I am a unique individual	ฉันเป็นคนที่มีเอกลักษณ์โดดเด่น	+1	
I would sacrifice an activity that I enjoy very much if my family did not approve of it	มันเป็นการเสียสละสิ่งที่ฉันชอบทำมากๆถ้าหากสิ่งนั้นครอบครัวของฉันไม่เห็นชอบด้วย	0	ฉันจะยอมแลกกิจกรรมที่ฉันชอบทำมากๆถ้าหากครอบครัวของฉันไม่เห็นชอบด้วย
Without competition it is not possible to have a good society	เราจะไม่มีโอกาสเป็นสังคมที่ดีได้เลยถ้าปราศจากการแข่งขัน	+1	

I feel good when I cooperate with others	ฉันรู้สึกดีเมื่อฉันให้ความร่วมมือกับคนอื่น	0	ฉันรู้สึกดีเมื่อฉันให้ความร่วมมือกับ**ผู้**อื่น
“We usually make a big weekly shopping trip.”	“เรามักจะมีไปซื้อของรอบใหญ่กันเป็นประจำทุกอาทิตย์”	0	“เรามักจะ**มี**ไปซื้อของรอบใหญ่กันเป็นประจำทุก**สัปดาห์**”
“I frequently buy food close to the best-before-date, if it is offered at a lower price.”	“ฉันมักจะซื้อสินค้าที่ใกล้ถึงวันที่ “ควรบริโภคก่อน”	-1	ฉันซื้อสินค้าที่ใกล้ถึงวันที่ “ควรบริโภคก่อน” บ่อยๆ ถ้าหากสินค้านั้นลดราคา
“I use the media to identify special offers on food products and plan to take advantage of them when I go shopping.”	“ฉันมักดูข้อเสนอพิเศษของสินค้าอาหารจากสื่อต่างๆ และมักจะใช้ข้อเสนอนั้นๆเวลาออกไปซื้อของ”	+1	
“I often keep food items in right conditions (e.g. in a fridge) so they will last.”	“ฉันมักจะเก็บของกินไว้ในสภาพที่เหมาะสม (เช่น ใส่ตู้เย็น) เพื่อให้อยู่ได้นานๆ”	+1	
“Food kept for a long time is not fresh and I do not want to eat it.”	“ของกินที่เก็บมาแล้วซักพักมันไม่สดใหม่ และฉันก็ไม่อยากที่จะกินมัน”	+1	“ของกินที่เก็บมาแล้วซักพักมันไม่สดใหม่ และฉันก็ไม่อยากที่จะ**รับประทาน**มัน”
“I always plan what we are going to eat a couple of days in advance.”	“ฉันมักจะวางแผนว่าจะกินอะไรล่วงหน้าประมาณ 2-3 วัน”	0	“ฉันมักจะวางแผนว่าจะ**รับประทาน**อะไรล่วงหน้าประมาณ 2-3 วัน” **เสมอ**
“What we are going to have for dinner is very often a last-minute decision.”	“จะกินอะไรเป็นอาหารเย็นนี่มักจะเป็นอะไรที่ติดสินใจเดี๋ยวนั้น”	0	“จะกินอะไรเป็นอาหารเย็นนี่มักจะเป็นอะไรที่ติดสินใจ**ในนาทีสุดท้าย**”
“I re-use leftover foods to make new meals.”	“ฉันเอาอาหารเหลือมาทำเป็นอาหารมื้อใหม่ได้”	+1	
“Certain members of the family have different tastes in food to the rest of the family.”	“มีสมาชิกในครอบครัวของฉันบางคนที่มีความชอบ และรสนิยมในอาหารที่แตกต่างไปจากคนอื่นๆในครอบครัว”	+1	
“Certain members of the family are choosy about what they eat.”	“มีสมาชิกในครอบครัวของฉันบางคนที่ชอบเลือกทาน”	+1	“มีสมาชิกในครอบครัวของฉันบางคนที่ชอบเลือก**รับประทาน**”
“When eating dinner, the most important thing is that we are together.”	“เวลารับประทานอาหารเย็น สิ่งที่สำคัญคือ การได้อยู่พร้อมหน้าพร้อมตากัน”	0	“เวลารับประทานอาหารเย็น สิ่งที่สำคัญ**ที่สุด**คือ การได้อยู่พร้อมหน้าพร้อมตากัน”

“I eat before I get hungry, which means that I am never hungry at meal times.”	“ฉันมักกินก่อนที่จะหิว นั้นหมายถึงว่าพอถึงมื้ออาหารจริงๆฉันก็ไม่หิว”	+1	“ฉันมัก**รับประทาน**ก่อนที่จะหิว นั้นหมายถึงว่าพอถึงมื้ออาหารจริงๆฉันก็ไม่หิว”
“I eat whenever I feel the slightest bit hungry.”	“พอหิวนิดหน่อยฉันก็หาอะไรกินเลย”	+1	“พอหิวนิดหน่อยฉันก็หาอะไร**รับประทาน**เลย”
“In our house, snacking is more common than set mealtimes.”	“ที่บ้านของฉัน เรามักจะกินอะไรกินเล่นมากกว่าที่จะกินเป็นมื้อๆ จริงจัง”	+1	
“At home, I often serve myself too much food more than I can finish.”	“เวลาอยู่บ้าน ฉันมักจะตักอาหารมากินเองมากเกินกว่าที่ฉันจะกินหมด”	-1	“เวลาอยู่บ้าน ฉันมักจะตัก ~~ตัก~~ อาหารมามากเกินกว่าที่ฉันจะรับประทานหมด”
“Going out for dinner is a regular part of our eating habits.”	“การออกไปกินอาหารเย็นนอกบ้านเป็นที่เราทำเป็นประจำ”	0	“การออกไป**รับประทาน**อาหารเย็นนอกบ้านเป็น**สิ่ง**ที่เราทำเป็นประจำ”
“I enjoy going to restaurants with family or friends.”	“ฉันชอบการออกไปร้านอาหารกับครอบครัว หรือกับเพื่อน”	+1	
“When eating out-of-home, I often order too much food for myself more than I can finish.”	“เวลาไปกินอาหารนอกบ้าน ฉันมักจะสั่งอาหารมากเกินไป เกินกว่าที่ฉันจะกินหมด”	-1	“เวลาไปรับประทานอาหารนอกบ้าน ฉันมักจะสั่งอาหารมาก เกินกว่าที่ฉันจะรับประทานหมด”
“I hate it when I need to throw food in the bin.”	“ฉันเกลียดมากเวลาที่จะต้องทิ้งของกินไป”	+1	
“As long as there are still hungry people in this world, food should not be thrown away.”	“ตราบใดที่ยังมีคนที่อดอยากไม่มีข้าวกิน ของกินก็ไม่ควรจะทิ้ง”	+1	“ตราบใดที่ยังมีคนที่อดอยากไม่มีข้าวกิน ของกินก็ไม่ควรจะ**ถูก**ทิ้ง”
“I rather take second helpings than leaving food on my plate.”	“ฉันเลือกที่จะให้คนอื่นมาช่วยกินดีกว่าเหลือของกินไว้บนจานของฉัน”	+1	“ฉันเลือกที่จะให้คนอื่นมาช่วย**รับประทาน** ดีกว่าเหลือของกินไว้บนจานของฉัน”
“For the food with “best before” date it is better to throw it away if the best before date has passed than risk eating it.”	“อาหารที่วันที่ “ควรบริโภคก่อน...” ได้ผ่านไปแล้วก็ควรทิ้งไปดีกว่าเสี่ยงที่จะกิน”	+1	

ขอบคุณมากค่ะ

Appendix 5 - In-depth Interview – Example of Transcripts (Translated from Thai to English)

Perception about Thai people's CFW behaviour in a meal setting

Participant 1: Mainly women will have leftover food because they want to lose weight. Those people like from construction sites who need energy would eat everything, all gone, nothing left!

Participant 2: Most of my customers finish all food. In case they cannot finish they will ask to wrap the food to take home.

Participant 3: I think it is normal that people cannot finish food on their plate. Most of them would just leave it there. Our food and dessert are cold served and it's not that they will look good or be suitable to eat again. But I will start to think if there is something wrong with my food. At the same I also have to notice first if it is because they order too much to begin with or not.

Participant 8: It is very rare for me to see food waste on customers' tables in my restaurant. They might have a little amount of soup left but it's normal. It's not that they waste it.

Participant 14: I've seen customers who come as a group help each other to finish all the food they took from the buffet table. It is because I will charge them if they have too much left. And as we are a buffet place, they cannot take leftover food home anyway. They have to be responsible for the food they have already taken

Participant 16: Some clients are old and sometimes they might be allergic to something. They won't eat specific ingredients. So, they can't finish it.

Participant 18: I think half-half. Half of them have nothing left and half of them would leave something. When there is food left on their plate, it's around 5% of the food that is left. I would be a little bit disappointed when there is a lot left. Is it because the food isn't tasty? Sometimes I would lose my confident if there is a lot left AND they don't ask to take it away with them.

Appendix 6 - CFW Behaviour Quantitative Analysis - Ethical Clearance

School of Agriculture, Policy and Development

ETHICAL CLEARANCE GRANTED

University of Reading

Form 2. MSc PhD Staff Ethical Clearance Submission Form

PLEASE allow a minimum of 3 weeks for this process.

You must not begin your research until you have obtained consent as evidenced by this form returned from the APD student Office signed and dated. Ethical Clearance cannot be granted retrospectively.

This form can only be used if the application :

- Does not involve participants who are patients or clients of the health or social services
- Does not involve participants whose capacity to give free and informed consent may be impaired within the meaning of the Mental Capacity Act 2005
- Does not involve patients who are 'vulnerable'
- Does not involve any element of risk to the researchers or participants
- Does not involve any participants who have a special relationship to the researchers/investigators

If any of the above apply, please refer to the APD Ethics Chair to decide whether an application can be made through the APD review process or whether the application needs to be referred to the full University Committee.

It is the applicant's responsibility to check for any particular requirements of a funder regarding ethical review. Some funders may require that the application is reviewed by full University Committee and not the devolved School committee.

Full details of the University Research Ethics procedures are available at http://www.reading.ac.uk/internal/res/ResearchEthics/reas-REethicshomepage.aspx and you are encouraged to access these pages for a fuller understanding. Some helpful advice is available on this link http://www.reading.ac.uk/internal/res/ResearchEthics/reas-REwhatdoIneedtodo.aspx and the FAQs are particularly relevant.

ALL QUESTIONS MUST BE COMPLETED.

APD Ethical Clearance Application Reference Number : Click here to enter text.

1. **APPLICANT DETAILS:**

Main applicant name:	Ponjan Pinpart
Name of academic supervisor/project investigator:	Dr. Daniele Asioli & Prof. Nikos Georgantzis
Email Address (decision will be emailed here):	ponjan.pinpart@pgr.reading.ac.uk
MSc Student	☐
PhD Student	☒
Staff Member	☐
Other (please specify)	Click here to enter text.

2. **PROJECT DETAILS:**

Title of project: Consumer Food Waste Behaviour and Social Norms: A Cross-country Comparison Between Thailand and United Kingdom

Please provide a lay summary of the project, including what is being investigated and why: Because consumers contribute to a significant amount of food waste that affects the environment, the economy, and the society, this project aims to investigate consumer food waste behaviour by comparing developing and developed countries with special interest into the effect of social norms. To be able to minimise food waste, factors of consumer food waste behaviour will be investigated. Moreover, the comparison between UK and Thai consumers will be conducted in order to see different types of behaviour and opinions.

Procedure. Please outline the project's research protocol (what procedures, research methods and analysis methods are being used) : The survey will be conducted via an online platform, Qualtrics. The main part of the questionnaire is based on the experimental vignette approach. 2^5 factorial design in balanced incomplete

blocks were implemented resulting in 32 (2x2x2x2x2) scenarios were generated. The 32 scenarios will be splitted into 4 blocks resulting in 8 scenarios/block. We plan to recruit 200 consumers per countries (i.e. Thailand and UK) (Total N=400 consumers) using Qualtrics or local contacts to recruit respondents depending on the budget availability. We settled up quotas recruitment based on age and gender (Age 18-46 yr: 50%. 47-75 yr: 50. Gender male: 50%, and female: 50% for both countries for the purpose of cross-country comparison). Therefore, in each country, the 200 consumers will be randomly splitted into 4 groups of 50 consumers each maintaining the same quota sampling. Each group will be assigned to one of the four blocks of eight scenarios (i.e. vignette). Data analysis will be conducted in three different steps.
1. Descriptive statistics: an analysis of the descriptive statistics of consumer characteristics will be conducted to compare the two countries investigated (i.e. UK and Thailand). STATA will be used to analyze the data.
2. Analysis of ranking data (i.e. vignette data): to identify the average data within both countries, we will analyze the data using both rank-ordered logit and OLS models to compare the findings using different softwares (i.e. STATA and NLOGIT) to check for the robustness of the data.
3.Segmentation analysis: from the regression models in 2) we will obtain subject-specific parameters. Then we will investigate individual differences (i.e. consumer heterogeneity) by using two different approach. First, a regression of the subject-specific coefficients against consumer characteristics using regression. Second, Principal Component Analysis (PCA) will be performed to segment consumers based on specific variables (i.e. attributes of the vignette) of interest and then Partial Least Square analysis-Discrimination Analysis (PLS-DA) will be used to check if consumers segments differ for specific consumer characteristics. STATA and Unscrambler will be used.

Period over which the data collection is to be undertaken (note: data collection CANNOT commence until ethical approval has been granted as evidenced by this form signed and returned).

Proposed Start Date:	01/10/2018
Proposed End Date:	01/03/2019

3. THE RESEARCH:

a) **Nature and number of participants** who are expected to take part in your survey/focus group. Please estimate if uncertain. As ethical clearance involving minors is more complex because of safeguarding and consent issues, please consider carefully whether you need to involve minors under the age of 16 in your research.

Participants	**Number participating**
Minors under 16 years of age	Click here to enter text.
Students	Click here to enter text.
Other members of the University	Click here to enter text.
Members of the general public	400 (UK=200, Thailand=200)
Businesses	Click here to enter text.
Government officials	Click here to enter text.
Other *If other please specify:*	Click here to enter text.

b) **Funding.** Is the research supported by funding from a research council or other external sources for example a charity or business?

Yes ☐ If yes, please specify funder : Click here to enter text.
No ☒

If yes, it is the responsibility of the applicant to check for any particular requirements of the funder regarding ethical review. Some funders may require that the application is reviewed by full University Committee and not the devolved School committee.

c) **Recruitment.** Please describe recruitment procedures. How have participants been selected? Are there any inclusion/exclusion criteria? Participants must be told on the Participant Information Sheet how and why they have been selected. You should attach ay recruitment materials to this application. The recruitment is carried out via Qualtrics

survey services based on the given quota (age and gender): Age 18-46 yr: 50%, 47-75 yr: 50. Gender male: 50%, and female: 50% for both countries for the purpose of cross-country comparison.
The participants will be those who are 18 year-old or older, have ever eaten out-of-home, and own a British citizenship (for UK subjects) or Thai citizenship (for Thai subjects).

d) Exceptions. Does the research involve minors, medical patients, individuals with learning difficulties, vulnerable adults, participants recruited through social service departments, or anyone in a special relationship with yourself/data collectors? E.g. Supervisor; lecturer to a group of students; or person in a position of responsibility for participants.

Yes ☐
No ☒

If yes, this may result in referral to the University Research Ethics Committee (please note their deadlines). Please provide extra detail here: Click here to enter text.

e) Where is the data collection to be undertaken? Specify country(ies) and specific location(s) Qualtrics online survey services for UK and Thailand.

f) What forms of data collection does the research involve?

Group discussion/ workshop	☐
Personal interviews	☐
Telephone interviews	☐
Questionnaire/paper survey	☐
Postal survey	☐
Email/ online survey	☒
Which software tool will be used, if any?	Qualtrics
Other *(specify)*:	Click here to enter text.

g) Who will undertake the collection and/or analysis of data?

Myself	☒
Other MSc students	☐
Other Higher degree students	☐
Other contract research and/or academic staff	☐
Individuals outside University	☐
External organisations	☒

If individuals outside the University and/or external organisations are involved in the collection or analysis of data, give brief details below. Indicate how the ethical procedures and standards of the University will be satisfied: There is no collection of personal data from subjects and it will be annonymous. The online survey will be accessed via login with password.

h) Does the research require participants to consume any food products?

No ☒
Yes ☐

If yes, please provide full details and indicate measures in place to ensure excellent food hygiene standards and ensure participant safety. Click here to enter text.

i) Do you consider there are any potential ethical issues in this project? Does the research require collection of information that might be considered sensitive in terms of confidentiality, potential to cause personal upset, etc.?

No ☒

Yes ☐

If yes, please provide full details and indicate how these issues will be addressed, how researchers will manage participant reaction. Support and de-brief sheets should be attached if relevant. Click here to enter text.

j) **Will the research involve any element of intentional deception at any stage? (i.e. providing false or misleading information about the study, or omitting information)?**

No ☒
Yes ☐

If yes, this must be justified here. You should also consider including debriefing materials for participants which outline the nature and justification of the deception used. Click here to enter text.

k) **Are participants offered a guarantee of anonymity and/or that the information they supply will remain confidential?**

Yes ☒
No ☐
If yes, give brief details of the procedures to be used to ensure this and particularly if the data has 'linked' or 'keyed' anonymity (eg. where published results are anonymous but participant details are recorded and held separately to the responses but keyed with reference number) : There is no collection of personal data (e.g. name or address) of participants. Participants only require to click "next" after the front page.

l) **Will participants be required to complete a separate consent form?** Many APD applications do not require participants to complete a separate consent form. Please see the templates provided.

☐ Yes. Names, addresses and copies of completed forms will be given to APD student office
☒ No. The data collection is anonymous and a combined information/consent sheet supplied
☐ Neither of the above, or the research involves participants under the age of 16
If 'neither of the above' selected, or the research involves participants under the age of 16, please outline the specific circumstances. Click here to enter text.

m) **Will participants be offered any form of incentive for undertaking the research?**

No ☐
Yes ☒
If yes, give brief details, including what will happen to the incentive should the participant later withdraw their input or decide not to proceed : Qualtrics will manage incentives to respondents via e-gift cards.

4. DATA PROTECTION

Data Storage, data protection and confidentiality. Please make sure you are familiar with the University of Reading's guidelines for data protection and information security. http://www.reading.ac.uk/internal/imps/

Please outline plans for the handling of data to ensure data protection and confidentiality. Covering the following issues: Will any personal information be stored? How and where will the data be stored? Who will have access to the data? When will it be deleted?

No personal data of participants will be collected and stored. The data from the survey will be stored in an electronic form in a Univerysity-owned PC and researcher's laptop. all with passcode to get access to. Only the researcher will have an access to. The data will be deleted in Janruary 2020 as the latest.

Applicants: Please now scroll to Section 7 to input your :

- Information Sheet(s) for Participants (mandatory)
- Data Collection Tools, for example: recruitment materials, interview/focus group protocols (how you are conducting the process), interview/focus group questions, questionnaires, online survey questions, debriefing and fact sheets

- Consent Forms (optional, may not be necessary if consent assumed in Information Sheet)

If the text boxes do not allow input in the desired format, please append documents separately to the email when sending this form.

Please then email your completed form (and any separate supporting documents) to your supervisor/project investigator. Project investigators or independent academics may return form directly to sapdethics@reading.ac.uk

A decision on whether ethical clearance has been granted will be emailed to you via the APD Student Office along with your authorised form.

You may NOT proceed with your data collection until ethical approval has been granted as evidenced by return of this approved form.

Note: The process of obtaining ethical approval does not include an assessment of the scientific merit of the questionnaire. That is the separate responsibility of your supervisor/project investigator in discussion with yourself.

5. Supervisor/project investigator review. Section to be completed by supervisor/PI where relevant.

Participant information sheet(s), data collection tools and any other supporting information may be pasted in section 7 below. Alternatively they may be attached to this email. Please review these documents and then complete the checklist below.

Checklist. Does this application and supporting documents adequately address the following ?

- ☒ The safety of the researcher(s) and those collecting data, the safety of the participant(s)
- ☒ Is the language /grammar/content appropriate (i.e. University standards and reputation upheld)
- ☒ There are no questions that might reasonably be considered impertinent or likely to cause distress to the participants
- ☒ The researcher has provided the participant information sheet (mandatory)
- ☒ The researcher has provided the questionnaire or survey/ workshop, focus group or interview questions (mandatory)
- ☒ The Participant Information Sheet gives sufficient information for the participants to give their INFORMED consent
- ☐ A separate consent form has been included (optional)
- ☒ Data will be handled, stored and deleted appropriately according to University guidelines, and the participants have been adequately informed about this in the Participant Information Sheet
- ☒ The Participant Information Sheet contains all relevant sections

- ☒ **I am satisfied that this application meets the minimum standards for APD Ethical Clearance to be granted**

Supervisor/Project Investigator, please forward this form as a WORD document and any separate supporting documents to sapdethics@reading.ac.uk. The form will be logged by the student office and allocated to an APD ethics committee reviewer. The APD ethics reviewer will review the application and complete section 6.

6. APD ethics committee review. Section to be completed by APD Ethics Committee member.

Decision

Clearance refused	☐ Resubmission required
Clearance granted as presented ☐	
Clearance granted subject to revisions suggested	☒ No need to resubmit once amended
Referred to APD Research Ethics Chair	☐ May require further information

Ethics Committee Member please enter comments, reasons for rejection, summary of revisions required before proceeding (if applicable):

Participant information sheet: There is checklist! The items on this check list that need to be addressed are 1.2,3,5.8.9.11.16. It is the responsibility of the supervisor to ensure that the changes will be implemented.

Question 51: need to add option "Prefer not to say"

Committee Member Name: Ariane Kehlbacher **Date Reviewed** : 04/10/2018

APD Ethics Committee member electronic signature (For signature, save document as pdf, then open pdf and use 'sign' option. Alternatively check here if no electronic signature used ☐)

APD Ethics Committee Member : Now please email this completed form (as signed pdf) to sapdethics@reading.ac.uk together with any separate supporting documents . The student office will record the outcome and return the completed form to the applicant with the decision.

7. Supporting Documents.

Please cut and paste the following documents into the text boxes below.

- Participant Information Sheet(s),
- Protocols (the procedures, how you will conduct and administer the data collection, interviews, surveys)
- Data Collection Instruments (interview questions and survey questions)
- Consent Forms (if Participant Information Sheet does not assume consent)
- Recruitment Materials (if relevant)

It is preferable that all information connected to this application is contained in one document. However, if you find that the text boxes below are not adequate, you may attach and email these supporting documents separately.

Supporting Documents for this application are pasted below. The text boxes cannot accept some types of formatting when pasting in documents. If this is the case, append them separately to the email with this form.

Consumer Food Waste Behaviour and Social Norms: A Cross-country Comparison between Thailand and United Kingdom

RESEARCH PROTOCOL

People involved

- Ponjan Pinpart, PhD candidate, University of Reading, UK
- Daniele Asioli, Lecturer, University of Reading, UK
- Nikolaos Georgantzís, Burgundy School of Business, France

Appendix 7 - CFW Behaviour Questionnaire Analysis - Supporting Documents (English)

Research protocol

People involved

Ponjan Pinpart, PhD candidate, University of Reading, UK

Daniele Asioli, Lecturer, University of Reading, UK

Nikolaos Georgantzís, Burgundy School of Business, France

Aim, objectives and research questions

Main Aim: To investigate consumer food waste behaviour by comparing between developing and developed countries with special interest into the effect of social norms.

Objectives	Research Questions
To investigate factors affecting consumer food waste behaviour and, in particular, the role of social norms.	What are the factors affecting consumer food waste behaviour? Are social norms affecting consumer food waste behaviour? What can we learn from these findings?
To compare consumer food waste behaviour between developing (Thailand) and developed (UK) countries and in particular the role of social norms.	Does consumer food waste behaviour differ between developing (Thailand) and developed (UK) countries? If yes, what are the differences? Does the different social norms between developing (Thailand – considered more collectivist) and developed countries (UK – considered more individualist) affect consumer food waste behaviour? What can we learn from these findings?

Methodology

Participants

We plan to recruit 200 consumers per countries (i.e. Thailand and UK) (Total N=400 consumers) using Qualtrics or local contacts to recruit respondents depending on the budget availability. We set up quota recruitment based on age and gender as shown in Table 1.

Table 1 - Sampling quotas for Thailand and UK

Thailand (n=200)	UK (n=200)
Age *18-46 yr: 50%* *47-75 yr: 50%*	Age *18-46 yr: 50%* *47-75 yr: 50%*
Gender *Male: 50%* *Female: 50%*	Gender *Male: 50%* *Female: 50%*

Experimental vignette approach, attributes and levels

Experimental vignette approach (Atzmüller and Steiner, 2010; Ellison and Lusk, 2018) will be used. Scenarios (i.e. vignette) are created by varying five attributes of two levels each. Table 2 presents the attributes and levels used.

Table 2 - Attributes and levels

Attributes	Levels
Commensality during dining	0- Alone 1- With others
Meal cost[34,35]	0- 100 ฿ (£6)[36] 1- 500 ฿ (£30)[4]
Place of meal[2]	0- At home 1- Out at a restaurant
Amount of leftover food[2]	0- Half 1- Whole
Future meal plan[2]	0- No plan 1- With plan

Experimental design

2^5 factorial design in balanced incomplete blocks were implemented resulting in 32 (2x2x2x2x2) scenarios were generated by using Minitab 18. The 32 scenarios will be splitted into 4 blocks resulting in 8 scenarios/block (Table 2).

[34] From Ellison and Lusk (2016)
[35] Cost of meal in each level is comparable using Purchasing Power Parity (private consumption) conversion factor in 2016 from World Bank (2018)
[36] Thai Baht Thai Baht (฿ (for Thai samples and GBP (£) for UK samples

Table 3 - The 32 scenarios from 2^5 factorial design in balanced incomplete blocks

Run Order	Block	Attributes				
		Commensality	Meal cost	Place of dining	Amount of leftovers	Future meal plan
1	1	alone	1	1	alone	1
2	1	with others	2	1	with others	2
3	1	with others	3	1	with others	3
4	1	alone	4	1	alone	4
5	1	with others	5	1	with others	5
6	1	alone	6	1	alone	6
7	1	alone	7	1	alone	7
8	1	with others	8	1	with others	8
9	2	with others	9	2	with others	9
10	2	alone	10	2	alone	10
11	2	alone	11	2	alone	11
12	2	with others	12	2	with others	12
13	2	alone	13	2	alone	13
14	2	with others	14	2	with others	14
15	2	with others	15	2	with others	15
16	2	alone	16	2	alone	16
17	3	with others	17	3	with others	17
18	3	alone	18	3	alone	18
19	3	alone	19	3	alone	19
20	3	with others	20	3	with others	20
21	3	alone	21	3	alone	21
22	3	with others	22	3	with others	22
23	3	with others	23	3	with others	23
24	3	alone	24	3	alone	24
25	4	alone	25	4	alone	25
26	4	with others	26	4	with others	26
27	4	with others	27	4	with others	27
28	4	alone	28	4	alone	28
29	4	with others	29	4	with others	29
30	4	alone	30	4	alone	30

Each vignette will read as follows:

Please read the following 8 situations and rank each of them from 1 to 8, where 1 = the most likely to save the leftovers and 8 = the most likely to throw away the remaining dinner. Please drag each situation choice up/down to match the ranking order.

> *"Imagine you have just finished eating dinner [alone/with others] [at home/out at a restaurant]. The meal costs about [100 ฿ (£6)/ 500 ฿ (£30)] per person. You're full, but there is still food left on the table enough for a [half/whole] lunch tomorrow. You [don't/already] have meals planned for lunch and dinner tomorrow."*

Therefore, in each country, the 200 consumers will be randomly splitted into 4 groups of 50 consumers each maintaining the same quota sampling. Each group will be assigned to one of

the four blocks of 8 scenarios (i.e. vignette) (see Table 2). Within each block, the eight scenarios will be randomly presented to consumers.

Consumer characteristics

A number of consumer characteristics will be collected to be used to segment and characterize consumers. Four main blocks will be collected:

1. ***Social norms***: social norms will be operationalised by measuring moral norms (Qi and Roe, 2016), injunctive norms (Stefan et al., 2013; Stancu et al., 2016), and personal normative attitudes (Schwartz, 1977; Lally et al., 2011; Georgantzis et al., 2017). An agree-disagree 7-point Likert scale will be used.
2. ***Cultural personalities***: a 14-item individualism and collectivism scale (Sivadas et al., 2008) will measure cultural personalities. An agree-disagree 7-point Likert scale will be used.
3. ***Consumer food-related lifestyle:*** the scale is developed and integrated between food lifestyle and food waste lifestyle literature. The three main sources are Brunso and Grunert (1995), Mallinson et al. (2016), and Aschemann-Witzel, de Hooge, et al. (2018). A 7-point Likert scale will be used.
4. ***Socio-Demographics:*** gender, age, citizenship, political orientation, religion orientation, education, race, number of household members, number of children under 18 year-old, area of residence and growing up, employment status, and income.

Data analysis

Data analysis will be conducted in three different steps.

1. ***Descriptive statistics:*** an analysis of the descriptive statistics of consumer characteristics will be conducted to compare the two countries investigated (i.e. UK and Thailand). STATA will be used to analyze the data.

2. ***Analysis of ranking data (i.e. vignette data):*** to identify the average data within both countries, we will analyze the data using both rank-ordered logit and OLS models to compare the findings using different software (i.e. STATA and NLOGIT) to check for the robustness of the data.

Appendix 8 - CFW Behaviour Quantitative Analysis – Questionnaire (English)

INTRODUCTION Block Options

INTRO

Reference Number: ${e://Field/Random%20ID}

CONSUMER FOOD WASTE BEHAVIOUR

I am a PhD student at the University of Reading. As part of my degree, I am conducting research on consumer food waste behaviour. This research project aims to find out lifestyle related to food waste, opinion, and behaviour regarding leftovers. You are being asked to participate in a research project by taking this online survey. I select my participants who are 18-75 years old, living in the UK and have British citizenship. The online survey should not take more than 15-20 minutes of your time.

You can be assured that your answers will be kept confidential. Your name will not be collected as part of your survey response and thus your identity can never be associated with the data. Your responses will not be individually identified or publicised. Your answers are strictly voluntary. You are free to withdraw from the survey at any time you feel uncomfortable or unwilling to participate by closing this survey. If you wish to withdraw, please contact Ponjan Pinpart (details below), quoting the reference number which is at the top right of this page. The reference number is a random number and will only be used to identify your questionnaire transcript and will not reveal any other information about you. Any contribution can be withdrawn up until the point at which the data is aggregated before 31 December 2018.

The submitted data will be used for statistical purposes only and statistical results will be reported in a PhD thesis, research papers, conferences, technical reports and academic journals. In the future, the statistical data may be used for subsequent research in the area of consumer behaviour, as a basis for comparison to future results, and as an example in teaching. Benefits include a broader understanding of consumer behaviour of food waste that can contribute to the formation of public policy. All data I collect will be stored securely electronically on a password-protected computer or in a hard copy version in a locked cupboard. If at any stage you wish to receive further information about this research project, please do not hesitate to contact Ponjan Pinpart before 31 May 2019. This will not affect your anonymity.

This application has been reviewed according to the procedures specified by the University of Reading Research Ethics Committee and has been given a favourable ethical opinion for conduct. If you have questions about your rights as a participant, you may contact the University of Reading - School of Agriculture Policy and Development Ethics Committee, Email: sapdethics@reading.ac.uk

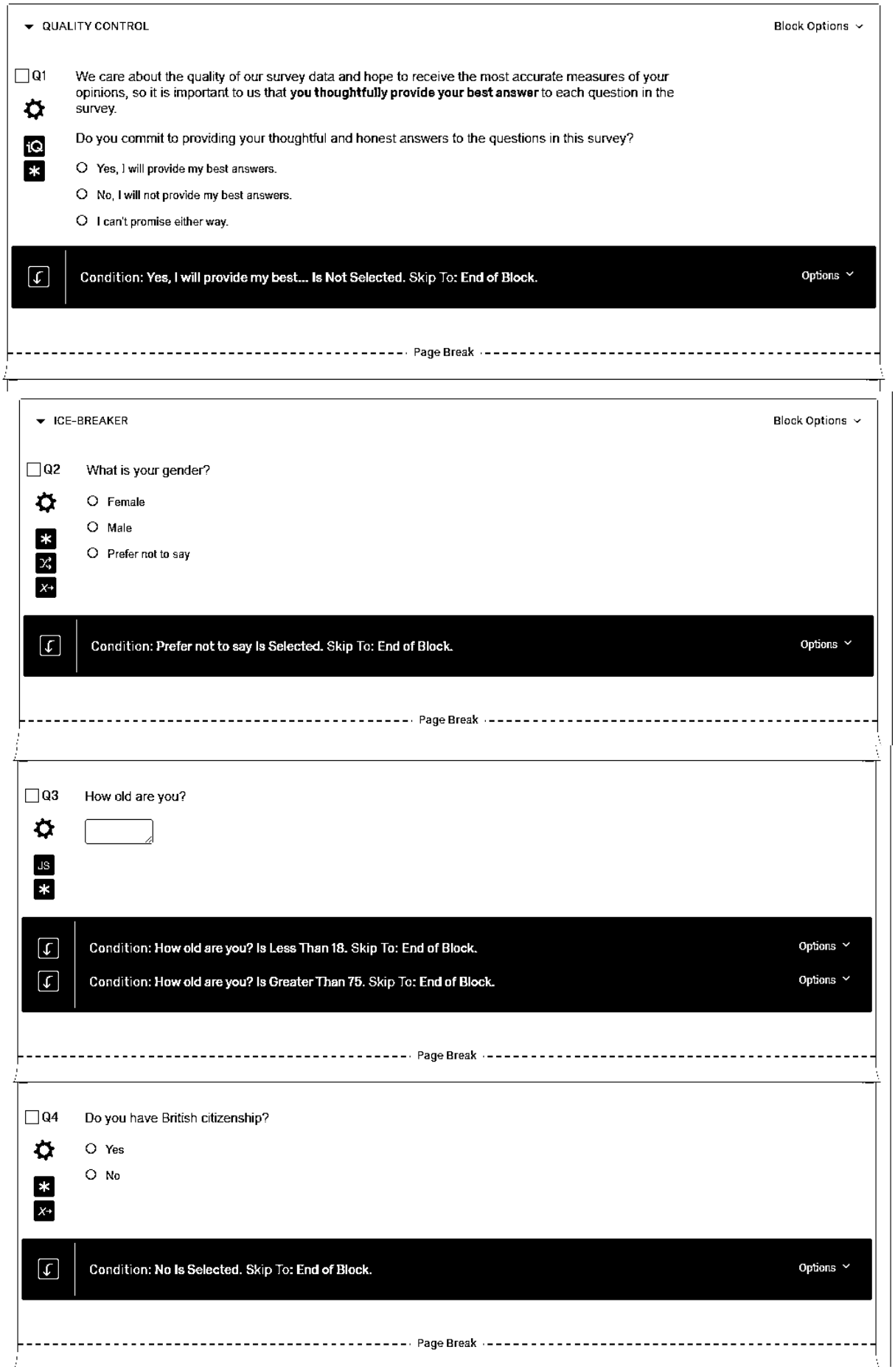
Completing the survey (questionnaire) and clicking the button to continue will be considered your consent to participate. By completing the questionnaire, you are acknowledging that you understand the terms of participation and that you consent to these terms.

Thank you very much for taking your time to take part in this survey!

Ponjan Pinpart

Student contact details
School of Agriculture, Policy, and Development
University of Reading
Agriculture Building
Earley Gate, Whiteknights Road
PO Box 237
Reading RG6 6AR
United Kingdom
Phone: +44 (0) [redacted]
E-Mail: ponjan.pinpart@pgr.reading.ac.uk

Supervisor contact details
Dr Daniele Asioli
School of Agriculture, Policy, and Development
University of Reading
Agriculture Building
Earley Gate, Whiteknights Road
PO Box 237
Reading RG6 6AR
United Kingdom
Phone: +44 (0) [redacted]
E-Mail: d.asioli@reading.ac.uk


QUALITY CONTROL
Block Options
Q1
We care about the quality of our survey data and hope to receive the most accurate measures of your opinions, so it is important to us that you thoughtfully provide your best answer to each question in the survey.
Do you commit to providing your thoughtful and honest answers to the questions in this survey?
Yes, I will provide my best answers.
No, I will not provide my best answers.
I can't promise either way.
Condition: Yes, I will provide my best.... Is Not Selected. Skip To: End of Block.
Options
Page Break
ICE-BREAKER
Block Options
Q2
What is your gender?
Female
Male
Prefer not to say
Condition: Prefer not to say Is Selected. Skip To: End of Block.
Options
Page Break
Q3
How old are you?
JS
Condition: How old are you? Is Less Than 18. Skip To: End of Block.
Options
Condition: How old are you? Is Greater Than 75. Skip To: End of Block.
Options
Page Break
Q4
Do you have British citizenship?
Yes
No
Condition: No Is Selected. Skip To: End of Block.
Options
Page Break

☐ Q5

A **household** is one person or a group of people who have the accommodation as their only or main residence AND (for a group)

- EITHER share at least one meal a day, OR
- share the living accommodation, that is, a living room or sitting room.

How many individuals currently live in your **household**, including yourself?

For example:
EXAMPLE 1: If you are a single person living on your own, please put 1.
EXAMPLE 2: If you are living with your family and there are 4 people in total including yourself, please put 4.
EXAMPLE 3: If you rent an accommodation with a communal kitchen but DO NOT commonly share any meal with other people, you are a single household, please put 1.

Number of persons in your household: ☐

Page Break

VIGNETTE - UK - BLOCK 1 Block Options

Q6.B1

Please read the following 8 situations and rank each of the 8 situations from 1 to 8 by putting a number in a box, where

1 = the most likely to save the remaining dinner and

8 = the most likely to throw away the remaining dinner.

Imagine you just finished eating dinner alone at home.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone at home.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others at home.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone out at a restaurant.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone out at a restaurant.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others at home.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others out at a restaurant.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others out at a restaurant.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Page Break

VIGNETTE - UK - BLOCK 2 Block Options

Q6.B2

Please read the following 8 situations and rank each of the 8 situations from 1 to 8 by putting a number in a box, where

1 = the most likely to save the remaining dinner and

8 = the most likely to throw away the remaining dinner.

Imagine you just finished eating dinner alone at home.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others at home.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone at home.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others at home.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone out at a restaurant.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others out at a restaurant.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone out at a restaurant.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others out at a restaurant.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Page Break

VIGNETTE - UK - BLOCK 3 Block Options

Q6.B3

Please read the following 8 situations and rank each of the 8 situations from 1 to 8 by putting a number in a box, where

1 = the most likely to save the remaining dinner and

8 = the most likely to throw away the remaining dinner.

Imagine you just finished eating dinner with others at home.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others out at a restaurant.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone out at a restaurant.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone at home.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone at home.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others at home.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone out at a restaurant.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others out at a restaurant.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Page Break

VIGNETTE - UK - BLOCK 4 Block Options

Q6.B4

Please read the following 8 situations and rank each of the 8 situations from 1 to 8 by putting a number in a box, where

1 = the most likely <u>to save</u> the remaining dinner and

8 = the most likely <u>to throw away</u> the remaining dinner.

Imagine you just finished eating dinner alone out at a restaurant.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone at home.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others out at a restaurant.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone out at a restaurant.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others out at a restaurant.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others at home.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for a whole lunch tomorrow.
You don't have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner with others at home.
The meal cost about £6 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Imagine you just finished eating dinner alone at home.
The meal cost about £30 per person.
You're full, but there is still food left on the table – enough for half a lunch tomorrow.
You already have meals planned for lunch and dinner tomorrow.

Page Break

CONSUMER CHARACTERISTICS — Block Options

INTRO

Now, we would like to ask you for some background information about you, your opinion, and your food-related lifestyle. It is a critical part of our analysis.

This is an anonymous survey. This means your name is not collected and is not linked to the responses. Also, all of this information will be treated as confidential. Results of the survey will only be used in an aggregate form and only for study purposes.

If you have any comments you would like to add, you can add in the last section before the end of the survey.

Page Break

Import Questions From... | Create a New Question

MORAL NORMS — Block Options

Q7 Please indicate to what extent you agree or disagree with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Wasting food would make me feel guilty about other people who do not have enough food to eat.	○	○	○	○	○	○	○
Wasting food would make me feel guilty about food producers who produce food for me.	○	○	○	○	○	○	○
Wasting food would make me feel guilty about the environment.	○	○	○	○	○	○	○
Wasting food would give me a bad conscience.	○	○	○	○	○	○	○

Page Break

INJUNCTIVE NORMS — Block Options

Q8 Please indicate to what extent you agree or disagree with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Most people who are important to me think that one should never waste food after meals.	○	○	○	○	○	○	○
Most people who are important to me think that one should reuse leftover food (e.g. reheat the leftovers or cook a new meal from the leftovers).	○	○	○	○	○	○	○
Most people who are important to me think that one should not harm the environment with food waste from meals.	○	○	○	○	○	○	○

Page Break

PERSONAL NORMATIVE ATTITUDES — Block Options

Q9 Now, I am going to ask about your own opinion.

Please indicate to what extent you agree or disagree with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I think one should never waste food after meals.	○	○	○	○	○	○	○
I think one should reuse leftover food (e.g. reheat the leftovers or cook a new meal from the leftovers).	○	○	○	○	○	○	○
I think one should not harm the environment with food waste from meals.	○	○	○	○	○	○	○

Page Break

CULTURAL PERSONALITY — Block Options

Q10 Please indicate to what extent you agree or disagree with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
My happiness depends very much on the happiness of those around me.	○	○	○	○	○	○	○
I would do what would please my family, even if I detested that activity.	○	○	○	○	○	○	○
I usually sacrifice my self-interest for the benefit of my group.	○	○	○	○	○	○	○
I enjoy working in situations involving competition with others.	○	○	○	○	○	○	○
The well-being of my co-workers is important to me.	○	○	○	○	○	○	○
I enjoy being unique and different from others in many ways.	○	○	○	○	○	○	○
Children should feel honoured if their parents receive a distinguished award.	○	○	○	○	○	○	○
I often "do my own thing".	○	○	○	○	○	○	○
Competition is the law of nature.	○	○	○	○	○	○	○
If a co-worker gets a prize, I would feel proud.	○	○	○	○	○	○	○
I am a unique individual.	○	○	○	○	○	○	○
I would sacrifice an activity that I enjoy very much if my family did not approve of it.	○	○	○	○	○	○	○
Without competition, it is not possible to have a good society.	○	○	○	○	○	○	○
I feel good when I cooperate with others.	○	○	○	○	○	○	○

Page Break

FOOD SHOPPING HABITS — Block Options

Q11 Are you responsible for food shopping in your household?

Always	Sometimes	Never
○	○	○

Condition: Never Is Selected. Skip To: End of Block. — Options

Page Break

Q12 Where do you usually buy food products to cook or prepare at home? Please check all that apply.

- ☐ Supermarket/hypermarket
- ☐ Farmers' market/ Local fresh market
- ☐ Grocery shop/ Greengrocers
- ☐ Corner/ Convenience shop
- ☐ Online grocery shop
- ☐ Other, please specify: _____

Page Break

Q13 On average **per week**, how much do you spend on food to cook at home for your household?

- ○ £0 - £10
- ○ £11 - £20
- ○ £21 - £30
- ○ £31 - £40
- ○ £41 - £50
- ○ £51 - £60
- ○ £61 - £70
- ○ More than £70
- ○ I do not know

Page Break

STORING HABITS — Block Options

Q14 Please indicate to what extent you agree or disagree with the following statement.

"In general, I often keep food items in right conditions (e.g. in a fridge) so they will last."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q15 Please indicate to what extent do you agree or disagree with the following statement.

"Food kept for a long time is not fresh and I do not want to eat it."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

PLANNING HABITS Block Options

Q16 Please indicate to what extent you agree or disagree with the following statement.

"I always plan what I am going to eat a couple of days in advance."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q17 Please indicate to what extent you agree or disagree with the following statement.

"What I am going to have for dinner is very often a last-minute decision."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

COOKING HABITS Block Options

Q18 How often do you cook at home?

- ○ Never
- ○ Less than once a month
- ○ 1 to 3 times per month
- ○ Once a week
- ○ 2 to 3 times per week
- ○ 4 to 5 times per week
- ○ Everyday

Condition: **Never Is Selected. Skip To: End of Block.** Options

Page Break

Q19 On average **each time**, how long does it take to cook at home for lunch or dinner?

- ○ 0-10 minutes
- ○ 11-20 minutes
- ○ 21-30 minutes
- ○ 31-40 minutes
- ○ 41-50 minutes
- ○ 51-60 minutes
- ○ 61-90 minutes
- ○ 91-120 minutes
- ○ 121-150 minutes
- ○ More than 150 minutes

Page Break

Q20

Do you have any of this kitchen equipment at home? Please check all that apply.

- ☐ Microwave
- ☐ Fridge
- ☐ Freezer
- ☐ Stove/hob
- ☐ Oven
- ☐ ⊗ None of the above

Page Break

Q21

Please indicate to what extent you agree or disagree with this statement.

"I re-use leftover foods to make new meals".

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

▼ EATING HABITS

Block Options

Q22

With whom do you **most often** have your meals?

- ○ Alone
- ○ Friends
- ○ Family members
- ○ Colleagues
- ○ Partner
- ○ Other, please specify

Page Break

Q23

Please indicate to what extent you agree or disagree with the following statement.

"Certain members of the family have different tastes in food from the rest of the family."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q24

Please indicate to what extent you agree or disagree with the following statement.

"Certain members of the family are choosy about what they eat."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q25

Please indicate to what extent you agree or disagree with the following statement.

"When eating dinner, the most important thing is that everyone (e.g. family or friends) is together."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q26

Please indicate to what extent you agree or disagree with the following statement.

"I eat before I get hungry, which means that I am never hungry at meal times."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q27

Please indicate to what extent you agree or disagree with the following statement.

"I eat whenever I feel the slightest bit hungry."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q28

Please indicate to what extent you agree or disagree with the following statement.

"At home, snacking is more common than set meal times."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q29

Please indicate to what extent you agree or disagree with the following statement.

"At home, I often serve myself too much food more than I can finish."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

EATING HABITS - Eating out

Block Options

Q30

How often do you eat out (e.g. at a restaurant etc.)?

- Never
- Less than once a month
- 1 to 3 times per month
- Once a week
- 2 to 3 times per week
- 4 to 5 times per week
- Every day

Condition: Never Is Selected. Skip To: End of Block.

Options

Page Break

Q31

Where do you usually go when you eat out? Please check all that apply.

- Fast food restaurants
- Street food shops
- Canteen/Cafeteria
- Casual dining place
- Formal dining place
- Café
- Other, please specify:

Page Break

Q32

Please indicate to what extent you agree or disagree with the following statement.

"Going out for dinner is a regular part of my eating habits."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q33

Please indicate to what extent you agree or disagree with the following statement.

"I enjoy going to restaurants with family and friends."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q34

Please indicate to what extent you agree or disagree with the following statement.

"When eating out, I often order too much food for myself more than I can finish."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q35

How often do you take leftovers home when you are eating out?

- Never
- Rarely (in less than 10% of the chances when they could have)
- Occasionally (in about 30% of the chances when they could have)
- Sometimes (in about 50% of the chances when they could have)
- Frequently (in about 70% of the chances when they could have)
- Usually (in about 90% of the chances when they could have)
- Every time

Page Break

FOOD WASTE BEHAVIOUR — Block Options

Q36

In your opinion, how often do **OTHER people** around you have food left on their plate to be discarded after a meal in general?

- Never
- Rarely (in less than 10% of the chances when they could have)
- Occasionally (in about 30% of the chances when they could have)
- Sometimes (in about 50% of the chances when they could have)
- Frequently (in about 70% of the chances when they could have)
- Usually (in about 90% of the chances when they could have)
- Every time

Page Break

Q37

How often do **YOU** have food left on your plate to be discarded after a meal?

- Never
- Rarely (in less than 10% of the chances when I could have)
- Occasionally (in about 30% of the chances when I could have)
- Sometimes (in about 50% of the chances when I could have)
- Frequently (in about 70% of the chances when I could have)
- Usually (in about 90% of the chances when I could have)
- Every time

Page Break

WASTING HABITS

Block Options

Q38

Please indicate to what extent you agree or disagree with the following statement.

"I hate it when I need to throw food in the bin."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q39

Please indicate to what extent you agree or disagree with the following statement.

"As long as there are still hungry people in this world, food should not be thrown away."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q40

Please indicate to what extent you agree or disagree with the following statement.

"I would rather have a second helping than leaving food on my plate."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

Q41

Please indicate to what extent you agree or disagree with the following statement.

"In general, for the food with "Best Before" date, it is better to throw it away if the date has passed than risk eating it."

Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
○	○	○	○	○	○	○

Page Break

POLITICAL ORIENTATION Block Options

Q42 When it comes to politics, do you usually think of yourself as liberal or conservative?

- Extremely liberal
- Slightly liberal
- Moderate or middle of the road
- Slightly conservative
- Extremely conservative
- I do not know

Page Break

RELIGION ORIENTATION Block Options

Q43 Do you follow any religion?

Yes	No
○	○

Condition: **No Is Selected. Skip To: End of Block.** Options

Page Break

Q44 How important is religion in your life?

Not at all important	Slightly important	Important	Very important	Extremely important
○	○	○	○	○

Page Break

Q45 Are you regularly attending a place of worship or religious service?

Never	Sometimes	About half of the time	Most of the time	Always
○	○	○	○	○

Page Break

SOCIO-DEMOGRAPHICS INFORMATION

Block Options

Q46

For the following questions, check or fill in the answers which best describe you.

What is your educational background?
Please choose the **highest** level of education you **have completed.**

- Primary school
- Secondary school
- College qualification (e.g. Diploma)
- University Degree (e.g. BA, BSc, Masters, PhD, PGCE)
- Other, please specify:

Page Break

Q47

What is your race?

- White
- Black or African American
- Hispanic
- Asian Indian
- Chinese
- Other Asian (e.g. Thai)
- Mixed race, please specify:
- Other, please specify:

Page Break

Q48

Are there any children under the age of 18 in your household?

Yes	No
○	○

Page Break

Q49

Did you grow up in a rural or an urban area?

Rural	Suburb	Urban
○	○	○

Page Break

Q50

These days, do you live today in a rural or an urban area?

Rural	Suburb	Urban
○	○	○

Page Break

Q51

What is your employment situation?

- Student
- Retired
- Independent worker (e.g. consultant)
- Unemployed (seeking work)
- Private-sector worker
- Not in paid employment (not seeking work e.g. houseman, housewife)
- Public-sector worker
- Other, please specify:

Page Break

Q52

Please indicate your approximate **annual household income before taxes:**

- Less than £15,000
- £15,000 to £24,999
- £25,000 to £34,999
- £35,000 to £44,999
- £45,000 to £54,999
- £55,000 to £64,999
- £65,000 to £74,999
- £75,000 to £84,999
- £85,000 to £94,999
- £95,000 and more
- I do not know.
- Prefer not to say.

Page Break

Ending

Block Options

END

You have reached the end of this survey. If you have any comments regarding this survey, please enter them in the box.

Page Break

Appendix 9 - CFW Behaviour Quantitative Analysis – Questionnaire (Thai)

INTRODUCTION Block Options

INTRO

หมายเลขอ้างอิง: ${e://Field/Random%20ID}

รายละเอียดสำหรับผู้ตอบแบบสอบถาม
พฤติกรรมผู้บริโภคด้านการรับประทานอาหารและอาหารเหลือทิ้ง
(Consumer Food Waste Behaviour)

การสำรวจพฤติกรรมผู้บริโภคด้วยแบบสอบถามออนไลน์นี้เป็นส่วนหนึ่งของการเรียนเพื่อใช้ในการจบการศึกษาระดับปริญญาเอกของดิฉัน นางสาวพรจันทร์ พิณเพาทย์ นักศึกษาปริญญาเอกจาก University of Reading สหราชอาณาจักร งานวิจัยนี้มีจุดมุ่งหมายเพื่อสำรวจพฤติกรรม รูปแบบการใช้ชีวิตของผู้บริโภคที่เกี่ยวกับอาหาร, ทัศนคติ, และพฤติกรรมเกี่ยวกับการจัดการอาหารที่ท่านรับประทานเหลือ ท่านได้รับเชิญให้เข้าร่วมตอบแบบสอบถามนี้ทางออนไลน์ ซึ่งท่านจะต้องมีอายุอยู่ในช่วง 18-75 ปี อาศัยอยู่ในประเทศไทย และมีสัญชาติไทย โดยการตอบแบบสอบถามนี้จะใช้ระยะเวลาประมาณ 15-20 นาที

ท่านสามารถมั่นใจได้ว่าคำตอบของท่านจะถูกเก็บเป็นความลับ จะไม่มีการถาม และเปิดเผย ชื่อ นามสกุล และข้อมูลส่วนตัวของท่าน ดังนั้นคำตอบที่ท่านให้จะไม่มีการเชื่อมโยงใดๆถึงตัวท่านเป็นรายบุคคล การเข้าร่วมตอบแบบสอบถามนี้จะดำเนินไปตามความสมัครใจของท่าน โดยท่านสามารถถอนตัวออกจากการเข้าร่วม เมื่อใดก็ตามที่ท่านรู้สึกไม่สบายใจ หรือเมื่อรู้สึกไม่อยากเข้าร่วมแล้ว ท่านสามารถทำได้โดยการปิดหน้าต่างของแบบสอบถามนี้ และถึงแม้ท่านจะส่งคำตอบทั้งหมดมาแล้ว ท่านก็สามารถขอถอนคำตอบของท่านได้หากท่านต้องการ โดยไม่จำเป็นต้องให้เหตุผลของการถอนตัวแต่อย่างใด ท่านสามารถทำได้โดยติดต่อนางสาวพรจันทร์ พิณเพาทย์ (รายละเอียดการติดต่อแสดงอยู่ด้านล่าง) โดยบอกหมายเลขอ้างอิงของท่านที่ปรากฏอยู่ขวามือด้านบนของหน้าจอนี้ หมายเลขอ้างอิงนี้เป็นหมายเลขสุ่มที่จะใช้บ่งชี้ถึงชุดคำตอบของแบบสอบถามเท่านั้น โดยจะไม่มีการเปิดเผยข้อมูลเกี่ยวกับตัวท่านแต่อย่างใด หากท่านประสงค์จะที่จะถอนความร่วมมือดังกล่าวมานี้ กรุณาแจ้งกับนักวิจัยก่อนที่ข้อมูลจะถูกรวบรวมเพื่อใช้ในการวิเคราะห์ในลำดับถัดไปก่อนวันที่ 31 ธันวาคม 2561

ข้อมูลจากแบบสอบถามนี้จะถูกนำไปใช้ในเชิงสถิติเท่านั้น และผลทางสถิตินี้จะปรากฏอยู่ในวิทยานิพนธ์ระดับปริญญาเอก บทความงานวิจัย เอกสารงานประชุม รายงานทางเทคนิค และเอกสารวิชาการ ข้อมูลที่ได้นี้อาจนำไปใช้เป็นข้อมูลสำหรับงานวิจัยที่เกี่ยวกับพฤติกรรมผู้บริโภคในด้านอื่นๆที่เกี่ยวข้อง หรือใช้เพื่อเป็นประโยชน์ในด้านการเรียนการสอน ประโยชน์ที่นักวิจัยจะได้รับจากข้อมูลของท่านคือความเข้าใจถึงพฤติกรรมผู้บริโภคด้านการรับประทานอาหาร และอาหารเหลือทิ้ง ซึ่งนักวิจัยและผู้ที่เกี่ยวข้องสามารถนำไปใช้ออกนโยบายทางด้านการจัดการและการลดปริมาณอาหารเหลือทิ้งได้ในอนาคต ข้อมูลทั้งหมดจะถูกเก็บไว้อย่างปลอดภัยในคอมพิวเตอร์ที่ต้องใช้รหัสผ่านในการเข้าถึง หรือเก็บในรูปแบบของลำเนาในตู้ที่ใช้กุญแจในการเปิด-ปิด หากท่านต้องการทราบรายละเอียดเกี่ยวกับงานวิจัยนี้ กรุณาติดต่อนางสาวพรจันทร์ พิณเพาทย์ ก่อนวันที่ 31 พฤษภาคม 2562 ซึ่งการติดต่อนี้ ท่านไม่จำเป็นต้องเปิดเผยตัวตนของท่านแต่อย่างใด

แบบสอบถาม และกระบวนการทำวิจัยนี้ได้รับการตรวจสอบตามกระบวนการของคณะกรรมการหลักจริยธรรม University of Reading (University of Reading Research Ethics Committee) และได้รับการอนุมัติให้ดำเนินการได้ หากท่านมีคำถามเกี่ยวกับสิทธิของท่านในฐานะผู้เข้าร่วมตอบแบบสอบถาม ท่านสามารถติดต่อมายังคณะกรรมการนี้ ได้ทางอีเมลล์ sapdethics@reading.ac.uk

การที่ท่านกดปุ่มดำเนินการต่อและ ทำแบบสอบถามจนเสร็จ จะถือว่าท่าน เข้าใจ และ ยอมรับกฎกติกา ข้อตกลง และเงื่อนไขในการเข้าร่วมงานวิจัยนี้

ขอขอบพระคุณเป็นอย่างสิ่งที่ท่านสละเวลาตอบแบบสอบถามนี้

นางสาวพรจันทร์ พิณเพาทย์

<u>รายละเอียดการติดต่อ</u>
ที่อยู่: School of Agriculture, Policy, and Development
University of Reading
Agriculture Building
Earley Gate, Whiteknights Road
PO Box 237
Reading RG6 6AR
United Kingdom
โทร: +44 (0) [redacted]
อีเมลล์: ponjan.pinpart@pgr.reading.ac.uk

<u>รายละเอียดการติดต่ออาจารย์ที่ปรึกษา</u>
ชื่อ: Dr Daniele Asioli
ที่อยู่: School of Agriculture, Policy, and Development
University of Reading
Agriculture Building
Earley Gate, Whiteknights Road
PO Box 237
Reading RG6 6AR
United Kingdom
โทร: +44 (0) [redacted]
อีเมลล์: d.asioli@reading.ac.uk

QUALITY CONTROL Block Options

Q1 เนื่องจากคุณภาพของข้อมูลที่จะได้รับจากแบบสอบถามนี้มีความสำคัญต่องานวิจัยมาก เราหวังว่าจะได้รับฟังความเห็นที่แท้จริงของท่าน

- ฉันจะตอบคำถามจากความคิดเห็นของฉันอย่างตั้งใจ และตรงตามความเป็นจริงที่สุด
- ฉันไม่สามารถให้ความคิดเห็นที่ตรงกับความเป็นจริงของฉันได้
- ฉันไม่สามารถบอกได้ว่าจะทำได้หรือไม่

Condition: ฉันจะตอบคำถามจากความคิดเห็น... Is Not Selected. Skip To: End of Block. Options

ICE-BREAKER Block Options

Q2 เพศ

- หญิง
- ชาย
- ไม่ประสงค์ที่จะตอบ

Condition: ไม่ประสงค์ที่จะตอบ Is Selected. Skip To: End of Block. Options

Page Break

Q3 อายุ

Condition: อายุ Is Less Than 18. Skip To: End of Block. Options

Condition: อายุ Is Greater Than 75. Skip To: End of Block. Options

Page Break

Q4 ท่านมีสัญชาติไทยหรือไม่

- มี
- ไม่มี

Condition: ไม่มี Is Selected. Skip To: End of Block. Options

Page Break

☐ Q5

ครัวเรือน หมายถึง คน 1 คนที่อาศัยอยู่ในบ้าน หรือกลุ่มคน (ไม่จำเป็นต้องเกี่ยวพันกันทางสายเลือด) ที่อาศัยอยู่ในที่เดียวกันที่เป็นที่อยู่อาศัยหลัก หรือเป็นที่แห่งเดียวที่ใช้อยู่อาศัย

สำหรับคนที่อยู่รวมกันเป็นกลุ่มจะถือเป็นครัวเรือนเดียวกันก็ต่อเมื่อมีลักษณะอย่างใดอย่างหนึ่งดังต่อไปนี้

- **ร่วมรับประทานอาหารด้วยกันอย่างน้อย 1 มื้อ/วัน หรือ**
- **ใช้ส่วนที่อยู่อาศัย เช่น ห้องนั่งเล่น หรือ ห้องรับประทานอาหารด้วยกัน**

ครัวเรือนของท่าน มีจำนวนกี่คน รวมตัวท่านด้วย

ตัวอย่าง
ถ้าท่านอยู่คนเดียว กรุณาใส่เลข 1
ถ้าท่านอาศัยอยู่กับครอบครัว มีทั้งหมด 4 **คนรวมท่านด้วย กรุณาใส่เลข 4**
ถ้าท่านอยู่คนเดียว โดยการเช่าที่อยู่อาศัย ท่านไม่ได้ใช้ห้องสำหรับพักผ่อนร่วมกับผู้อื่น หรือ ไม่ได้รับประทานอาหารร่วมกับผู้อื่นที่อาศัยอยู่ในอาคารเดียวกันกับท่าน จำนวนครัวเรือนของท่านคือ 1 คน กรุณาใส่เลข 1

จำนวนสมาชิกในครัวเรือนของท่านรวมตัวท่านด้วย คือ: [ ]

Page Break

VIGNETTE - THAI - BLOCK 1 Block Options

Q6.B1

กรุณาอ่านสถานการณ์ด้านล่างทั้งหมด 8 สถานการณ์ แล้วสมมติว่าท่านอยู่ในสถานการณ์นั้นๆ
กรุณาเรียงลำดับ และใส่หมายเลข 1 ถึง 8 ในช่องด้านหน้าทุกช่อง (หมายเลขต้องไม่ซ้ำกัน) โดยที่

1 หมายถึง ท่านมีแนวโน้มที่จะเก็บอาหารมื้อเย็นที่เหลือนั้นไว้มากที่สุด

8 หมายถึง ท่านมีแนวโน้มที่จะทิ้งอาหารมื้อเย็นที่เหลือนั้นมากที่สุด

ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่บ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ
ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่บ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ
ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว

ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่บ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ
ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว

ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ
ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ
ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว

ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่บ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ
ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ
ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว

ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ
ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

Page Break

VIGNETTE - THAI - BLOCK 2 Block Options

Q6.B2

กรุณาอ่านสถานการณ์ด้านล่างทั้งหมด 8 สถานการณ์ แล้วสมมติว่าท่านอยู่ในสถานการณ์เช่นๆ
กรุณาเรียงลำดับ และใส่หมายเลข 1 ถึง 8 ในช่องด้านหน้าทุกช่อง (หมายเลขต้องไม่ซ้ำกัน) โดยที่

1 หมายถึง ท่านมีแนวโน้มที่จะเก็บอาหารมื้อเย็นที่เหลือนั้นไว้มากที่สุด

8 หมายถึง ท่านมีแนวโน้มที่จะทิ้งอาหารมื้อเย็นที่เหลือนั้นมากที่สุด

- [ ] ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่บ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว
- [ ] ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่บ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้
- [ ] ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่บ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้
- [ ] ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่บ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว
- [ ] ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้
- [ ] ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว
- [ ] ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว
- [ ] ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

Page Break

VIGNETTE - THAI - BLOCK 3 Block Options

Q6.B3

กรุณาอ่านสถานการณ์ด้านล่างทั้งหมด 8 สถานการณ์ แล้วสมมติว่าท่านอยู่ในสถานการณ์เช่นๆ
กรุณาเรียงลำดับ และใส่หมายเลข 1 ถึง 8 ในช่องด้านหน้าทุกช่อง (หมายเลขต้องไม่ซ้ำกัน) โดยที่

1 หมายถึง ท่านมีแนวโน้มที่จะเก็บอาหารมื้อเย็นที่เหลือนั้นไว้มากที่สุด

8 หมายถึง ท่านมีแนวโน้มที่จะทิ้งอาหารมื้อเย็นที่เหลือนั้นมากที่สุด

☐ ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่บ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ
ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว

☐ ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ
ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

☐ ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ
ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

☐ ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่บ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ
ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

☐ ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่บ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ
ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว

☐ ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่บ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ
ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

☐ ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ
ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว

☐ ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ
ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว

Page Break

VIGNETTE - THAI - BLOCK 4 Block Options

Q6.B4

กรุณาอ่านสถานการณ์ด้านล่างทั้งหมด 8 สถานการณ์ แล้วสมมติว่าท่านอยู่ในสถานการณ์นั้นๆ
กรุณาเรียงลำดับ และใส่หมายเลข 1 ถึง 8 ในช่องด้านหน้าทุกช่อง (หมายเลขต้องไม่ซ้ำกัน) โดยที่

1 หมายถึง ท่านมีแนวโน้มที่จะเก็บอาหารมื้อเย็นที่เหลือนั้นไว้มากที่สุด

8 หมายถึง ท่านมีแนวโน้มที่จะทิ้งอาหารมื้อเย็นที่เหลือนั้นมากที่สุด

ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ
ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่บ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ
ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ
ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว

ท่านเพิ่งรับประทานอาหารเย็นเสร็จคนเดียวที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ
ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว

ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่ร้านอาหารนอกบ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ
ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่บ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ทั้งมื้อ
ท่านยังไม่มีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่บ้าน อาหารมีมูลค่าประมาณ 100 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ
ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว

ท่านเพิ่งรับประทานอาหารเย็นเสร็จกับผู้อื่นที่บ้าน อาหารมีมูลค่าประมาณ 500 บาทต่อคน
ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ครึ่งมื้อ
ท่านมีแผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้แล้ว

Page Break

CONSUMER CHARACTERISTICS

Block Options

INTRO

ในส่วนต่อไปนี้เรามีความประสงค์ที่จะสอบถามความคิดเห็น และข้อมูลบางส่วนของท่าน ซึ่งเป็นส่วนที่สำคัญยิ่งต่องานวิจัย

ในแบบสอบถามนี้ จะไม่มีการเก็บข้อมูลส่วนตัวโดยเฉพาะชื่อของท่าน ดังนั้นคำตอบของท่านจะไม่มีการเชื่อมโยงใดๆถึงตัวตนของท่าน และข้อมูลทั้งหมดจะถูกเก็บเป็นความลับ เราจะนำข้อมูลที่ท่านให้ไปวิเคราะห์ซึ่งจะเป็นไปในลักษณะภาพรวมของข้อคิดเห็นทั้งหมดจากทุกท่าน และเพื่อวัตถุประสงค์ทางการศึกษาเท่านั้น

หากท่านมีข้อคิดเห็นเพิ่มเติม ท่านสามารถแสดงข้อคิดเห็นของท่านเพิ่มเติมได้ในส่วนสุดท้ายของแบบสอบถามค่ะ

Page Break

MORAL NORMS

Block Options

Q7 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความเห็นอย่างไรต่อประโยคดังต่อไปนี้

	ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
การทิ้งอาหารทำให้ฉันรู้สึกผิดต่อผู้อื่นที่ขาดแคลนอาหาร	○	○	○	○	○	○	○
การทิ้งอาหารทำให้ฉันรู้สึกผิดต่อเกษตรกรหรือ ผู้ที่ผลิตอาหารมาให้ฉันรับประทาน	○	○	○	○	○	○	○
การทิ้งอาหารทำให้ฉันรู้สึกผิดต่อสิ่งแวดล้อม	○	○	○	○	○	○	○
การทิ้งอาหารทำให้ฉันรู้สึกขาดคุณธรรม	○	○	○	○	○	○	○

Page Break

INJUNCTIVE NORMS

Block Options

Q8 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

	ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
คนที่มีความสำคัญสำหรับฉันส่วนใหญ่มักคิดว่าคนเราควรที่จะ ไม่ปล่อยให้มีอาหารเหลือทิ้งในแต่ละมื้อ	○	○	○	○	○	○	○
คนที่มีความสำคัญสำหรับฉันส่วนใหญ่มักคิดว่าคนเราควรที่จะ เอาอาหารที่เหลือมาใช้ หรือเอามากินต่อได้ (เช่น นำมาอุ่นหรือ เอาไปประกอบอาหารเป็นอาหารมื้อใหม่ เป็นต้น)	○	○	○	○	○	○	○
คนที่มีความสำคัญสำหรับฉันส่วนใหญ่มักคิดว่าคนเราควรที่จะ ไม่ทำลายสิ่งแวดล้อมด้วยอาหารเหลือทิ้ง	○	○	○	○	○	○	○

Page Break

▼ PERSONAL NORMATIVE ATTITUDES Block Options

Q9

ในส่วนต่อไปนี้ เราจะถามถึงความคิดเห็นของตัวท่านเอง

กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

	ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
ฉันคิดว่าคนเราควรที่จะ ไม่ปล่อยให้มีอาหารเหลือทิ้งในแต่ละมื้อ	○	○	○	○	○	○	○
ฉันคิดว่าคนเราควรที่จะ เอาอาหารที่เหลือมาใช้ หรือเอามากินต่อได้ (เช่น นำมาอุ่นหรือเอาไปประกอบอาหารเป็นอาหารมื้อใหม่ เป็นต้น)	○	○	○	○	○	○	○
ฉันคิดว่าคนเราควรที่จะ ไม่ทำลายสิ่งแวดล้อมด้วยอาหารเหลือทิ้ง	○	○	○	○	○	○	○

Page Break

▼ CULTURAL PERSONALITY Block Options

Q10

กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

	ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
ความสุขของฉันขึ้นอยู่กับความสุขของคนรอบตัวฉันอย่างมาก	○	○	○	○	○	○	○
ฉันจะทำในสิ่งที่ครอบครัวของฉันพึงพอใจ ถึงแม้ว่าฉันจะรังเกียจสิ่งนั้นก็ตาม	○	○	○	○	○	○	○
ฉันยอมเสียสละประโยชน์ส่วนตน เพื่อผลประโยชน์ของพวกพ้อง	○	○	○	○	○	○	○
ฉันสนุกกับการทำงานในสภาพแวดล้อมที่ต้องแข่งขันกับผู้อื่น	○	○	○	○	○	○	○
ความสุขของผู้ที่ทำงานร่วมกับฉันเป็นสิ่งสำคัญสำหรับฉัน	○	○	○	○	○	○	○
ฉันชอบที่จะมีเอกลักษณ์ และแตกต่างจากผู้อื่นในหลายๆด้าน	○	○	○	○	○	○	○
ลูกๆควรรู้สึกเป็นเกียรติเมื่อพ่อแม่ประสบความสำเร็จ หรือ ได้รับรางวัลพิเศษ	○	○	○	○	○	○	○
ฉันมักจะทำอะไรด้วยตัวเองในแบบของฉัน	○	○	○	○	○	○	○
การแข่งขันเป็นเรื่องธรรมชาติที่เกิดขึ้นเป็นธรรมดา	○	○	○	○	○	○	○
ฉันจะรู้สึกภูมิใจ ถ้าผู้ร่วมงานของฉันได้รับรางวัล	○	○	○	○	○	○	○
ฉันเป็นคนที่มีเอกลักษณ์ของตัวเอง	○	○	○	○	○	○	○
ถ้าครอบครัวของฉันไม่เห็นด้วยต่อสิ่งที่ฉันทำ แม้ว่าฉันจะสนุกและชอบทำมาก ฉันก็จะยอมไม่ทำสิ่งนั้น	○	○	○	○	○	○	○
การแข่งขันคือสิ่งที่เกิดขึ้นเป็นธรรมดาในสังคม	○	○	○	○	○	○	○
ฉันรู้สึกดีเมื่อฉันให้ความร่วมมือกับผู้อื่น	○	○	○	○	○	○	○

Page Break

▼ FOOD SHOPPING HABITS Block Options

Q11 ท่านมีหน้าที่ซื้ออาหาร สำหรับรับประทานในครัวเรือนของท่านหรือไม่

เป็นประจำ	เป็นบางครั้ง	ไม่เคยเลย
○	○	○

Condition: ไม่เคยเลย Is Selected. Skip To: End of Block. Options

Page Break

Q12 โดยปกติแล้วท่านซื้อวัตถุดิบ และ/หรือ อาหาร เพื่อมาปรุง หรือเตรียมสำหรับรับประทานที่บ้านจากที่ใด (สามารถเลือกได้มากกว่า 1 คำตอบ)

- ☐ ซุปเปอร์มาร์เก็ต หรือ ไฮเปอร์มาร์เก็ต
- ☐ ตลาดนัด, ตลาดสด, ตลาดเกษตรกร หรือตลาดที่ผู้ผลิตอาหารนำมาขายโดยตรง
- ☐ ร้านขายของชำ
- ☐ ร้านสะดวกซื้อ
- ☐ ร้านค้าออนไลน์
- ☐ อื่นๆ โปรดระบุ:

Page Break

Q13 โดยเฉลี่ยแล้ว ท่านมีค่าใช้จ่ายในการซื้อวัตถุดิบ และ/หรือ อาหารเพื่อนำมาปรุง หรือเตรียมสำหรับรับประทานที่บ้านประมาณเท่าไหร่ ต่อสัปดาห์

- ○ 0-150 บาท
- ○ 151-300 บาท
- ○ 301-450 บาท
- ○ 451-600 บาท
- ○ 601-750 บาท
- ○ 751-900 บาท
- ○ 901-1,050 บาท
- ○ มากกว่า 1,050 บาท
- ○ ไม่ทราบ

Page Break

▼ STORING HABITS Block Options

Q14 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"โดยทั่วไปแล้ว ฉันมักจะเก็บอาหาร หรือของกินไว้ในสภาพที่เหมาะแก่การเก็บรักษา (เช่นเก็บใส่ตู้เย็น) เพื่อที่จะเก็บไว้ได้นานๆ"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q15 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"อาหาร หรือของกินที่เก็บมานานแล้ว จะไม่สดใหม่ และฉันก็ไม่อยากกินมัน"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

PLANNING HABITS

Block Options

Q16 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"ฉันมักจะวางแผนว่าจะกินอะไรล่วงหน้าประมาณ 2-3 วัน"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q17 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"ฉันจะกินอะไรเป็นอาหารเย็นมักจะเป็นอะไรที่ตัดสินใจเดี๋ยวนั้น"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

COOKING HABITS

Block Options

Q18 ท่านทำอาหารที่บ้านบ่อยแค่ไหน

- ○ ไม่เคยเลย
- ○ น้อยกว่าเดือนละครั้ง
- ○ 1 ถึง 3 ครั้งต่อเดือน
- ○ สัปดาห์ละครั้ง
- ○ 2 ถึง 3 ครั้งต่อสัปดาห์
- ○ 4 ถึง 5 ครั้งต่อสัปดาห์
- ○ ทุกวัน

Condition: ไม่เคยเลย Is Selected. Skip To: End of Block. Options

Page Break

Q19 โดยเฉลี่ยแล้วท่านใช้เวลาในการทำอาหารมื้อกลางวัน หรือมื้อเย็น กี่นาทีในแต่ละครั้ง

- ○ 0-10 นาที
- ○ 11-20 นาที
- ○ 21-30 นาที
- ○ 31-40 นาที
- ○ 41-50 นาที
- ○ 51-60 นาที
- ○ 61-90 นาที
- ○ 91-120 นาที
- ○ 121-150 นาที
- ○ มากกว่า 150 นาที

Page Break

Q20 ที่บ้านของท่านมีอุปกรณ์ใดบ้าง (สามารถเลือกได้มากกว่า 1 คำตอบ)

- ☐ ไมโครเวฟ
- ☐ ตู้เย็น
- ☐ ตู้แช่แข็ง/ช่องแช่แข็ง (ช่องฟรีส)
- ☐ เตาไฟฟ้า/เตาแก๊ส
- ☐ เตาอบ/ ตู้อบ
- ☐ ⊗ ไม่มีอุปกรณ์ข้างต้นเลย

Page Break

Q21 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"ฉันเอาอาหารที่เหลือมาอุ่นหรือทำเป็นอาหารมื้อใหม่"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วย หรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

EATING HABITS Block Options

Q22 ท่านมักจะรับประทานอาหารกับใครบ่อยที่สุด

- ○ คนเดียว
- ○ เพื่อน
- ○ สมาชิกในครอบครัว
- ○ เพื่อนร่วมงาน
- ○ แฟน
- ○ อื่นๆ โปรดระบุ

Page Break

Q23 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"มีสมาชิกในครอบครัวของฉันบางคนที่มีรสนิยมในการกินอาหารที่แตกต่างไปจากคนอื่นในครอบครัว"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q24 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"มีสมาชิกในครอบครัวของฉันบางคนที่ชอบเลือกกิน"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q25 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"เวลากินข้าวเย็น สิ่งที่สำคัญที่สุดคือการที่ทุกคน (เช่นครอบครัว หรือ เพื่อน ฯลฯ) อยู่พร้อมหน้าพร้อมตากัน"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q26 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"ฉันมักจะกินก่อนที่จะหิว นั่นหมายถึงว่าเมื่อถึงเวลามื้ออาหารจริงๆ ฉันก็ไม่เคยหิวเลย"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q27 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"พอหิวนิดหน่อยฉันก็หาอะไรกินเลย"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q28 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"ที่บ้านของฉัน ฉันมักจะกินของกินเล่นมากกว่าที่จะกินอาหารเป็นมื้อๆ"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q29 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"เวลาอยู่บ้าน ฉันมักจะตักอาหารมากินมากกว่าที่ฉันจะสามารถกินได้หมด"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

EATING HABITS - Eating out

Block Options

Q30 ท่านรับประทานอาหารนอกบ้าน (เช่นตามร้านอาหาร) บ่อยแค่ไหน

- ○ ไม่เคยเลย
- ○ น้อยกว่าเดือนละครั้ง
- ○ 1 ถึง 3 ครั้งต่อเดือน
- ○ สัปดาห์ละครั้ง
- ○ 2 ถึง 3 ครั้งต่อสัปดาห์
- ○ 4 ถึง 5 ครั้งต่อสัปดาห์
- ○ ทุกวัน

Condition: ไม่เคยเลย Is Selected. Skip To: End of Block.

Options

Page Break

Q31 เวลาออกไปรับประทานอาหารนอกบ้าน ท่านมักจะไปที่ใด (สามารถเลือกได้มากกว่า 1 คำตอบ)

- ☐ ร้านอาหารฟาสต์ฟู้ด
- ☐ ร้านข้างทาง ริมถนน
- ☐ โรงอาหาร หรือ ฟู้ดคอร์ท
- ☐ ร้านง่ายๆ ไม่เป็นทางการ
- ☐ ร้านอาหารหรูหรา เป็นทางการ
- ☐ คาเฟ่ หรือ ตามร้านกาแฟ
- ☐ อื่นๆ โปรดระบุ

Page Break

Q32 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"ฉันออกไปกินอาหารยินนอกบ้านเป็นประจำ"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q33 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"ฉันชอบและมีความสุขกับการออกไปกินอาหารที่ร้านอาหารกับครอบครัว หรือกับเพื่อน"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q34 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"เวลาไปกินอาหารนอกบ้าน ฉันมักจะสั่งอาหารมากเกินไป เกินกว่าที่ฉันจะกินหมด"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q35 เวลาที่ท่านรับประทานอาหารนอกบ้าน และมีอาหารเหลือ บ่อยแค่ไหนที่ท่านนำอาหารที่เหลือห่อกลับบ้าน

- ○ ไม่เคยทำเลย
- ○ แทบจะไม่เคยทำเลย (น้อยกว่า 10% ของโอกาสทั้งหมด)
- ○ ทำบ้างเป็นบางโอกาส (ประมาณ 30% ของโอกาสทั้งหมด)
- ○ ทำบ้างไม่ทำบ้าง (ประมาณ 50% ของโอกาสทั้งหมด)
- ○ ทำค่อนข้างบ่อย (ประมาณ 70% ของโอกาสทั้งหมด)
- ○ ทำบ่อยมาก (ประมาณ 90% ของโอกาสทั้งหมด)
- ○ ทำทุกครั้ง

Page Break

FOOD WASTE BEHAVIOUR Block Options

Q36 ในความคิดเห็นของท่าน ท่านคิดว่าโดยทั่วไปแล้วคนอื่นๆเวลารับประทานอาหาร มีอาหารเหลือทิ้งในแต่ละมื้อบ่อยแค่ไหน

- ○ ไม่เคยมีเหลือทิ้งเลย
- ○ แทบจะไม่เคยมีเหลือทิ้งเลย (น้อยกว่า 10% ของโอกาสทั้งหมด)
- ○ มีเหลือทิ้งบ้างเป็นบางโอกาส (ประมาณ 30% ของโอกาสทั้งหมด)
- ○ มีเหลือบ้างไม่เหลือบ้าง (ประมาณ 50% ของโอกาสทั้งหมด)
- ○ มีเหลือทิ้งค่อนข้างบ่อย (ประมาณ 70% ของโอกาสทั้งหมด)
- ○ มีเหลือทิ้งบ่อยมาก (ประมาณ 90% ของโอกาสทั้งหมด)
- ○ มีเหลือทิ้งทุกครั้ง

Page Break

Q37 ตัวท่านเองเวลารับประทานอาหาร มีอาหารเหลือทิ้งในแต่ละมื้อบ่อยแค่ไหน

- ○ ไม่เคยมีเหลือทิ้งเลย
- ○ แทบจะไม่เคยมีเหลือทิ้งเลย (น้อยกว่า 10% ของโอาสทั้งหมด)
- ○ มีเหลือทิ้งบ้างเป็นบางโอกาส (ประมาณ 30% ของโอกาสทั้งหมด)
- ○ มีเหลือบ้างไม่เหลือบ้าง (ประมาณ 50% ของโอกาสทั้งหมด)
- ○ มีเหลือทิ้งค่อนข้างบ่อย (ประมาณ 70% ของโอกาสทั้งหมด)
- ○ มีเหลือทิ้งบ่อยมาก (ประมาณ 90% ของโอกาสทั้งหมด)
- ○ มีเหลือทิ้งทุกครั้ง

Page Break

WASTING HABITS Block Options

Q38 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"ฉันรู้สึกไม่ชอบเป็นอย่างมากเวลาที่ต้องทิ้งอาหาร"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q39 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"ตราบใดที่ในโลกเรายังมีคนที่ยังขาดแคลนอาหาร อาหารก็ไม่ควรจะถูกทิ้งขว้าง"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q40 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"ฉันมักจะเลือกกินเพิ่มดีกว่าปล่อยให้มีอาหารเหลือทิ้ง"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

Q41 กรุณาเลือกคำตอบที่ตรงกับความรู้สึกของท่าน ท่านมีความคิดเห็นอย่างไรต่อประโยคดังต่อไปนี้

"โดยทั่วไป อาหารที่เลย วันที่ "ควรบริโภคก่อน..." ไปแล้ว ก็ควรทิ้งไปดีกว่าเสี่ยงที่จะกิน"

ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	ค่อนข้างไม่เห็นด้วย	บอกไม่ได้ว่าเห็นด้วยหรือไม่เห็นด้วย	ค่อนข้างเห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
○	○	○	○	○	○	○

Page Break

POLITICAL ORIENTATION Block Options

Q42 ถ้าเป็นด้านการเมือง ท่านคิดว่าท่านจัดอยู่ในคนกลุ่มใด

- ○ เป็นพวกเสรีนิยม อย่างมาก
- ○ ค่อนข้างเป็นพวกเสรีนิยม
- ○ กลางๆระหว่างเสรีนิยม กับอนุรักษ์นิยม
- ○ ค่อนข้างเป็นพวกอนุรักษ์นิยม
- ○ เป็นพวกอนุรักษ์นิยมอย่างมาก
- ○ ฉันไม่รู้

Page Break

RELIGION ORIENTATION Block Options

Q43 ท่านนับถือศาสนาอะไรหรือไม่

นับถือ	ไม่ได้นับถือศาสนาใด
○	○

Condition: ไม่ได้นับถือศาสนาใด Is Selected. Skip To: End of Block. Options

Page Break

Q44 ศาสนามีความสำคัญในระดับใดต่อชีวิตท่าน

ไม่มีความสำคัญเลยอย่างสิ้นเชิง	ค่อนข้างสำคัญ	สำคัญ	สำคัญมาก	สำคัญอย่างยิ่งยวด
○	○	○	○	○

Page Break

Q45 ท่านไปศาสนสถานของท่าน หรือไปเข้าร่วมกิจกรรมทางศาสนาบ่อยหรือไม่

ไม่เคยไปเลย	ไปบ้างเป็นบางครั้ง	ไปครึ่งไม่ไปครึ่ง	ไปบ่อยๆ	ไปตลอดเวลา
○	○	○	○	○

Page Break

SOCIO-DEMOGRAPHICS INFORMATION Block Options

Q46 คำถามต่อไปนี้ กรุณาเลือกคำตอบที่อธิบายตัวท่านได้มากที่สุด

ระดับการศึกษาสูงสุดของท่านคือระดับใด
กรุณาเลือกระดับการศึกษาสูงสุดที่ท่านได้รับวุฒิมาแล้ว

- ○ ระดับประถมศึกษา
- ○ ระดับมัธยมศึกษา
- ○ วุฒิระดับประกาศนียบัตร ปวช. ปวศ.
- ○ วุฒิระดับมหาวิทยาลัย (เช่นปริญญาตรี ปริญญาโท ฯลฯ)
- ○ อื่นๆ โปรดระบุ:

Page Break

Q47 เชื้อชาติ

- ○ ชาวผิวขาว (White)
- ○ ชาวผิวดำ หรือ แอฟริกันอเมริกัน (Black or African American)
- ○ สิสแปนิก (Hispanic)
- ○ อินเดีย (Asian Indian)
- ○ จีน (Chinese)
- ○ คนเอเชีย เช่น ไทย (Other Asian (e.g. Thai))
- ○ เชื้อสายผสม (Mixed race) โปรดระบุ:
- ○ อื่นๆ โปรดระบุ:

Page Break

Q48 มีเด็กอายุต่ำกว่า 18 ปีในครัวเรือนของท่านหรือไม่

- มี
- ไม่มี

Page Break

Q49 ท่านโตมาในสิ่งแวดล้อมแบบใด

- ชนบท
- ชานเมือง
- เมือง

Page Break

Q50 แล้วทุกวันนี้ท่านอยู่อาศัยในสิ่งแวดล้อมแบบใด

- ชนบท
- ชานเมือง
- เมือง

Page Break

Q51 อาชีพ

- นักเรียน นิสิต นักศึกษา
- อาชีพอิสระ (เช่น ที่ปรึกษา)
- พนักงานภาคเอกชน
- พนักงานภาครัฐ
- เกษียณ
- ยังไม่ได้รับการจ้างงาน (กำลังหางาน)
- ไม่ได้ทำงานที่ได้รับค่าจ้าง และ ไม่ได้กำลังหางาน (เช่นพ่อบ้าน แม่บ้าน)
- อื่นๆ โปรดระบุ:

Page Break

Q52 กรุณาระบุรายได้ครัวเรือนต่อปีก่อนหักภาษีของท่านโดยประมาณ

- น้อยกว่า 100,000 บาท
- 100,000 ถึง 199,999 บาท
- 200,000 ถึง 299,999 บาท
- 300,000 ถึง 399,999 บาท
- 400,000 ถึง 499,999 บาท
- 500,000 ถึง 599,999 บาท
- 600,000 ถึง 699,999 บาท
- 700,000 ถึง 799,999 บาท
- 800,000 ถึง 899,999 บาท
- มากกว่าหรือเท่ากับ 900,000 บาท
- ฉันไม่รู้
- ไม่ประสงค์ที่จะตอบ

Page Break

Ending Block Options

END ส่วนนี้เป็นส่วนสุดท้ายของแบบสอบถาม ถ้าหากท่านมีข้อคิดเห็นเพิ่มเติม ท่านสามารถเติมลงในกล่องด้านล่างนี้ได้ค่ะ

Page Break

Appendix 10 - Focus Group Discussion Ethical Clearance

School of Agriculture, Policy and Development

ETHICAL CLEARANCE GRANTED

University of Reading

Form 2. MSc PhD Staff Ethical Clearance Submission Form

PLEASE allow a minimum of 3 weeks for this process.
You must not begin your research until you have obtained consent as evidenced by this form returned from the APD student Office signed and dated. Ethical Clearance cannot be granted retrospectively.

This form can only be used if the application :

- Does not involve participants who are patients or clients of the health or social services
- Does not involve participants whose capacity to give free and informed consent may be impaired within the meaning of the Mental Capacity Act 2005
- Does not involve patients who are 'vulnerable'
- Does not involve any element of risk to the researchers or participants
- Does not involve any participants who have a special relationship to the researchers/investigators

If any of the above apply, please refer to the APD Ethics Chair to decide whether an application can be made through the APD review process or whether the application needs to be referred to the full University Committee.

It is the applicant's responsibility to check for any particular requirements of a funder regarding ethical review. Some funders may require that the application is reviewed by full University Committee and not the devolved School committee.

Full details of the University Research Ethics procedures are available at http://www.reading.ac.uk/internal/res/ResearchEthics/reas-REethicshomepage.aspx and you are encouraged to access these pages for a fuller understanding. Some helpful advice is available on this link http://www.reading.ac.uk/internal/res/ResearchEthics/reas-REwhatdoIneedtodo.aspx and the FAQs are particularly relevant.

ALL QUESTIONS MUST BE COMPLETED.

APD Ethical Clearance Application Reference Number : 001027P

1. **APPLICANT DETAILS:**

Main applicant name:	Ponjan Pinpart
Name of academic supervisor/project investigator:	Daniele Asioli, Kelvin Balcombe
Email Address (decision will be emailed here):	ponjan.pinpart@pgr.reading.ac.uk
MSc Student	☐
PhD Student	☒
Staff Member	☐
Other (please specify)	Click here to enter text.

2. **PROJECT DETAILS:**

Title of project: Consumer Food Waste-Focus Group Discussion

Please provide a lay summary of the project, including what is being investigated and why: Qualitative research using focus group discussion as a method to investigate. explore and highlight in-depth the opinions. motivations. perceptions. experiences and differences between Thailand and United Kingdom regarding consumer food waste behaviour during eating situations.

Procedure. Please outline the project's research protocol (what procedures, research methods and analysis methods are being used) : Qualitative research method will be implemented using focus group discussion as a tool. We plan to conduct two focus groups in the UK and another two focus groups in Thailand. The quota of participants is guided by the quantitative study which is an equal number of genders and age groups. The participants must have Thai and British citizenship for Thailand and the UK discussion group respectively. The panellists will be members of the general public. The recommended number of consumers for each focus group is between

6-12. There will be two focus groups for each country. so the total number of consumers involved in focus group per countries will be between 12-24. Participants will be compensated for their time each with a restaurant discount voucher. The reward is given to them at the end of the discussion. Data collection consists of four main materials. First, notes taken during the focus groups discussions. Second, expanded notes collated by research team right after the focus groups. The note takers and moderators will meet and discuss the preliminary information collected (i.e. notes, observed emotion, and projective maps) to agree on the findings because the information is still fresh to recall. Third, focus groups audio and video-recording will be transcribed in the following days. Finally, projected ideas and language from the projective mapping task are also collected. The analysis begins after the discussion has been transcribed and added with materials indicated in the previous section. The main analysis method if based on a thematic analysis and using NVIVO on transcript enriched by notes and debriefing. The analysis, which was a qualitative content analysis, will be carried out in six steps:

1. Recording: All focus group interviews will be recorded by tape recorders in order to provide a basis for transcribing the discussions.
2. Transcription: The focus group discussions will be transcribed. Nonverbal communication will be considered in the transcription process.
3. Coding: In a third step, the focus group discussions will be coded. This enabled the discussion to be structured into different themes.
4. Group specific theme analysis: After coding, an analysis of the specific issues that arose in each focus group will be conducted.
5. Comprehensive theme analysis: The issue-related results of each focus group interview were compared in each case study country in order to identify differences and similarities-
6. Projective mapping task, notes and debrifing: the results will be enriched and modelled also based on notes and debriefing prepared during the group discussion.

Period over which the data collection is to be undertaken (note: data collection CANNOT commence until ethical approval has been granted as evidenced by this form signed and returned).

Proposed Start Date: 16/05/2019
Proposed End Date: 31/08/2019

3. THE RESEARCH:

a) Nature and number of participants who are expected to take part in your survey/focus group. Please estimate if uncertain. As ethical clearance involving minors is more complex because of safeguarding and consent issues, please consider carefully whether you need to involve minors under the age of 16 in your research.

Participants	**Number participating**
Minors under 16 years of age	Click here to enter text.
Students	Click here to enter text.
Other members of the University	Click here to enter text.
Members of the general public	12-24 people/ country
Businesses	Click here to enter text.
Government officials	Click here to enter text.
Other *If other please specify:*	Click here to enter text.

b) Funding. Is the research supported by funding from a research council or other external sources for example a charity or business?

Yes ☒ If yes, please specify funder : It's not a direct fund but local restaurants provide vouchers to give to participants as an incentive. No details in the incentive sections
No ☐

If yes, it is the responsibility of the applicant to check for any particular requirements of the funder regarding ethical review. Some funders may require that the application is reviewed by full University Committee and not the devolved School committee.

c) **Recruitment.** Please describe recruitment procedures. How have participants been selected? Are there any inclusion/exclusion criteria? Participants must be told on the Participant Information Sheet how and why they have been selected. You should attach ay recruitment materials to this application. Recruitment methods include posters and online advertisements. The materials will be put at announcement boards around the University of Reading campuses for the UK and around Kasetsart University, Bangkok, in Thailand. The locations of those boards are in supermarkets, restaurants, and public places such as bus stops (see Appendix I and II). Additionally, by putting the advertisement at those places, we want to recruit those people who ever experienced dining out of home and engaged in various types of food consumption. People who are interested in taking part in the study can contact us via email which will be provided in the poster. After receiving the email, we will send out a participant information sheet so that they can learn more details about the study. In the information sheet, prospective participants will be given information about research rationale, confidentiality and how we are dealing with collected data, and procedures of the study which also include how we are recording the discussion. If they are interested in becoming our interviewees, they are subject to screening process.

d) **Exceptions.** Does the research involve minors, medical patients, individuals with learning difficulties, vulnerable adults, participants recruited through social service departments, or anyone in a special relationship with yourself/data collectors? E.g. Supervisor; lecturer to a group of students; or person in a position of responsibility for participants.

Yes ☐
No ☒

If yes, this may result in referral to the University Research Ethics Committee (please note their deadlines). Please provide extra detail here: Click here to enter text.

e) **Where is the data collection to be undertaken?** Specify country(ies) and specific location(s) In UK, it will be in Reading and in Thailand, it will be in Bangkok

f) **What forms of data collection does the research involve?**

Group discussion/ workshop	☒
Personal interviews	☐
Telephone interviews	☐
Questionnaire/paper survey	☐
Postal survey	☐
Email/ online survey	☒
Which software tool will be used, if any?	Qualtrics
Other *(specify)*:	Online survey in Qualtrics will be used as a tool for screening participants.

g) **Who will undertake the collection and/or analysis of data?**

Myself	☒
Other MSc students	☐
Other Higher degree students	☐
Other contract research and/or academic staff	☒
Individuals outside University	☐
External organisations	☐

If individuals outside the University and/or external organisations are involved in the collection or analysis of data, give brief details below. Indicate how the ethical procedures and standards of the University will be satisfied: Click here to enter text.

h) Does the research require participants to consume any food products?

No ☒
Yes ☐

If yes, please provide full details and indicate measures in place to ensure excellent food hygiene standards and ensure participant safety. Click here to enter text.

i) Do you consider there are any potential ethical issues in this project? Does the research require collection of information that might be considered sensitive in terms of confidentiality, potential to cause personal upset, etc.?

No ☒
Yes ☐

If yes, please provide full details and indicate how these issues will be addressed, how researchers will manage participant reaction. Support and de-brief sheets should be attached if relevant. Click here to enter text.

j) Will the research involve any element of intentional deception at any stage? (i.e. providing false or misleading information about the study, or omitting information)?

No ☒
Yes ☐

If yes, this must be justified here. You should also consider including debriefing materials for participants which outline the nature and justification of the deception used. Click here to enter text.

k) Are participants offered a guarantee of anonymity and/or that the information they supply will remain confidential?

Yes ☒
No ☐

If yes, give brief details of the procedures to be used to ensure this and particularly if the data has 'linked' or 'keyed' anonymity (eg. where published results are anonymous but participant details are recorded and held separately to the responses but keyed with reference number) : No personal details are collected. The partcipants will be informed in advance when they contact me to show their interest in joining that there will be VDO recording during the discussion. The discussion will be recorded and transcribed. However. they will not be identified in the recordings. They will be given a reference number at the beginning of the session and we will use this number to refer to them and their comments. We will not name them in any of our study reports or publications. Additionally. all participants will be asked to respect everyone's confidentiality. We will ask everyone to refer to one another by number such as "participant 3". It is also fine if their prefer to use their own nickname.

l) Will participants be required to complete a separate consent form? Many APD applications do not require participants to complete a separate consent form. Please see the templates provided.

☐ Yes. Names, addresses and copies of completed forms will be given to APD student office
☒ No. The data collection is anonymous and a combined information/consent sheet supplied
☐ Neither of the above, or the research involves participants under the age of 16

If 'neither of the above' selected, or the research involves participants under the age of 16, please outline the specific circumstances. Click here to enter text.

m) Will participants be offered any form of incentive for undertaking the research?

No ☐
Yes ☒

If yes, give brief details, including what will happen to the incentive should the participant later withdraw their input or decide not to proceed : They will receive restautant discount vouchers from local restaurants in Reading for the UK and in Bangkok for Thailand. They will receive once they have finished the discussion. They will be told from the beginning it is not possible to withdraw once the discussion has been finished because of the nature of the discussion, researchers cannot "unhear" what has been heard. Therefore, the vouchers do not need to be returned as there is less likely any withdrawal after receive.

4. **DATA PROTECTION**

Data Storage, data protection and confidentiality. Please make sure you are familiar with the University of Reading's guidelines for data protection and information security. http://www.reading.ac.uk/internal/imps/

Please outline plans for the handling of data to ensure data protection and confidentiality. Covering the following issues: Will any personal information be stored? How and where will the data be stored? Who will have access to the data? When will it be deleted?

The video recordings will be typed up by me. Once it is typed up, the recordings will be permanently deleted straight away. Any electronic form of typed up files will be stored on a password protected computer. Paper notes will be stored in a locked cabinet. I am the only one who has access to these materials.

Applicants: Please now scroll to Section 7 to input your :

- Information Sheet(s) for Participants (mandatory)
- Data Collection Tools, for example: recruitment materials, interview/focus group protocols (how you are conducting the process), interview/focus group questions, questionnaires, online survey questions, debriefing and fact sheets
- Consent Forms (optional, may not be necessary if consent assumed in Information Sheet)

If the text boxes do not allow input in the desired format, please append documents separately to the email when sending this form.

Please then email your completed form (and any separate supporting documents) to your supervisor/project investigator. Project investigators or independent academics may return form directly to sapdethics@reading.ac.uk

A decision on whether ethical clearance has been granted will be emailed to you via the APD Student Office along with your authorised form.

You may NOT proceed with your data collection until ethical approval has been granted as evidenced by return of this approved form.

Note: The process of obtaining ethical approval does not include an assessment of the scientific merit of the questionnaire. That is the separate responsibility of your supervisor/project investigator in discussion with yourself.

5. Supervisor/project investigator review. Section to be completed by supervisor/PI where relevant.

Participant information sheet(s), data collection tools and any other supporting information may be pasted in section 7 below. Alternatively they may be attached to this email. Please review these documents and then complete the checklist below.

Checklist. Does this application and supporting documents adequately address the following ?

- ☒ The safety of the researcher(s) and those collecting data, the safety of the participant(s)
- ☒ Is the language /grammar/content appropriate (i.e. University standards and reputation upheld)
- ☒ There are no questions that might reasonably be considered impertinent or likely to cause distress to the participants
- ☒ The researcher has provided the participant information sheet (mandatory)
- ☒ The researcher has provided the questionnaire or survey/ workshop, focus group or interview questions (mandatory)
- ☒ The Participant Information Sheet gives sufficient information for the participants to give their INFORMED consent
- ☐ A separate consent form has been included (optional)
- ☒ Data will be handled, stored and deleted appropriately according to University guidelines, and the participants have been adequately informed about this in the Participant Information Sheet
- ☒ The Participant Information Sheet contains all relevant sections

- ☒ **I am satisfied that this application meets the minimum standards for APD Ethical Clearance to be granted**

Supervisor/Project Investigator, please forward this form as a WORD document and any separate supporting documents to sapdethics@reading.ac.uk. The form will be logged by the student office and allocated to an APD ethics committee reviewer. The APD ethics reviewer will review the application and complete section 6.

6. APD ethics committee review. Section to be completed by APD Ethics Committee member.

Decision

Clearance refused		☐	Resubmission required
Clearance granted as presented	☐		
Clearance granted subject to revisions suggested		☒	No need to resubmit once amended
Referred to APD Research Ethics Chair		☐	May require further information

Ethics Committee Member please enter comments, reasons for rejection, summary of revisions required before proceeding (if applicable):

Remove section Who has reviewed this study and replace by "This application has been reviewed according to the procedures specified by the University Research Ethics Committee and has been given a favourable ethical opinion for conduct" as provided by the guidance.

[redacted]

Committee Member Name: Ariane Kehlbacher **Date Reviewed :** 25/04/2019

APD Ethics Committee member electronic signature (For signature, save document as pdf, then open pdf and use 'sign' option. Alternatively check here if no electronic signature used ☐)

Appendix 11 - Focus Group Discussion Protocol and Questions (English)

Consumer Food Waste Behaviour:

A Qualitative Study Comparing between Thailand and the United Kingdom

RESEARCH PROTOCOL

1 PEOPLE INVOLVED

- Ponjan Pinpart, PhD candidate, University of Reading, UK
- Daniele Asioli, Lecturer, University of Reading, UK
- Kelvin Balcombe, Professor, University of Reading, UK
- Agnese Rondoni, PhD candidate, University of Reading, UK

2 AIM, OBJECTIVES AND RESEARCH QUESTIONS

Main Aim: To investigate, explore and highlight in-depth the opinions, motivations, perceptions, experiences and differences between Thailand and United Kingdom regarding consumer food waste behaviour during eating situations.

Objectives	Research Questions
To investigate and explore in-depth the factors (i.e. presence of other people during meals, cost of the meals, place of dining, amount of leftover food and plan for tomorrow lunch) affecting consumer food waste behaviour during eating situations.	What are the factors affecting consumer food waste behaviour? Why the presence of other people is important/not important in food waste decision in eating situations? Why the cost of the meal is important/not important in food waste decision in eating situations? Why the place of dining is important/not important in food waste decision in eating situations? Why the amount of leftover food is important/not important in food waste decision in eating situations?

	Why having plan for tomorrow lunch is important/not important in food waste decision in eating situations? Which are the consumers' opinions, feelings, experiences and perceptions for food waste in different eating situations?
To compare opinions between Thai and British consumers about factors affecting food waste behaviour	What are the differences and similarities between Thai and British consumer's view about factors affecting food waste behaviour related to presence of other people during meals, cost of the meals, place of dining, amount of leftover food and plan for tomorrow lunch during eating situations?

3 METHODOLOGY

Qualitative research method will be implemented using focus group discussion as a tool. We plan to conduct two focus groups in the UK and another two focus groups in Thailand. The quota of participants is guided by the quantitative study which is an equal number of genders and age groups. The presentation of the results will be in line with the objectives of the study. This will be explained in the following section.

3.1 PARTICIPANTS

To ensure the diversity of participants in each discussion group as well as to maintain the same dynamic as the previous quantitative study, the same quotas are applied as shown in Table 1. Moreover, the participants must have Thai and British citizenship for Thailand and the UK discussion group respectively. We aim for an equal proportion of genders and age groups. The panellists will be members of the general public. The recommended number of consumers for each focus group is between 6-12. There will be two focus groups for each country, so the total number of consumers involved in focus group per countries will be between 12-24.

Table 1 - Participant quotas per focus group for Thailand and UK

Criteria		Thailand (n=12)	UK (n=12)
Male	18-46 year-old	25% (3)	25% (3)
	47-75 year-old	25% (3)	25% (3)
Female	18-46 year-old	25% (3)	25% (3)
	47-75 year-old	25% (3)	25% (3)

3.1.1 RECRUITMENT

Recruitment methods include posters and online advertisements. The materials will be put at announcement boards around the University of Reading campuses for the UK and around Kasetsart University, Bangkok, in Thailand. The locations of those boards are in supermarkets, restaurants, and public places such as bus stops (see Appendix I and II). Additionally, by putting the advertisement at those places, we want to recruit those people who ever experienced dining out of home and engaged in various types of food consumption. People who are interested in taking part in the study can contact us via email which will be provided in the poster. After receiving the email, we will send out a participant information sheet so that they can learn more details about the study. In the information sheet, prospective participants will be given information about research rationale, confidentiality and how we are dealing with collected data, and procedures of the study which also include how we are recording the discussion (more details in section 3.2). If they are interested in becoming our interviewees, they are subject to screening process.

3.1.2 SCREENING

After prospective participants have been informed about the study, we will screen them according to our planned quota. To do this, we will direct them to online screening questions based on their citizenship, current place of living, age group, and gender. If they fall into our required quota, we will make an appointment with them to take part in our focus group discussions.

3.2 FOCUS GROUP DISCUSSION PROCEDURE

Each group of discussion comprises of a small group of participants as per the quota, a facilitator (or a moderator) to guide the conversation, and a note taker (Berg and Lune, 2012). Our session will involve four parts: 1) introduction, 2) projective mapping, 3) group discussion, and 4) closing. Apart from note taking by a

researcher, we will film and voice record the discussion, which has already mentioned in the participant information sheet. With the video recording, it enables us to distinguish ownership of opinions between participants. In other words, when transcribing the interview, we are aware which comments belong to any particular participants. Moreover we can capture nonverbal messages such as gestures and facial expression which are not transparent in voice recording or written notes (Stewart et al., 2007).

3.2.1 Introduction (5-10 minutes)

Facilitators and note takers welcome participants to the session. When everyone has arrived, we introduce ourselves, the study, and allow everyone to give a brief introduction of themselves. However, from the beginning we will ask everyone to address each other by participant's number which will be given when the participants arrive. This is due to the confidential purpose that everyone will be anonymous in our study. After overall explanation of the study procedures were explained, we will introduce the topic (i.e. ice-breaker) of food waste in dining situations and instruct them about the next step of an individual task.

3.2.2 Group discussion – general topic about food waste experience and warm up

The objective of this session is to introduce the participants to the topic of food waste and ask them about their experience in relation to food waste and creating leftovers.

3.2.3 Projective mapping (10 – 30 minutes)

The objective of this session is to warm up participants and familiarise them with the study by using a projective mapping technique. Projective mapping has been implemented in the area of sensory testing of products. Assessors project their holistic opinions about that products onto a paper (Dehlholm, 2014). Qualitative value is an add-on step when facilitators ask assessors to describe samples with some keywords. We will adapt and implement the technique to let participants to

start thinking about plate waste in our study context. The projective mapping procedure for this study is described in Figure 1.

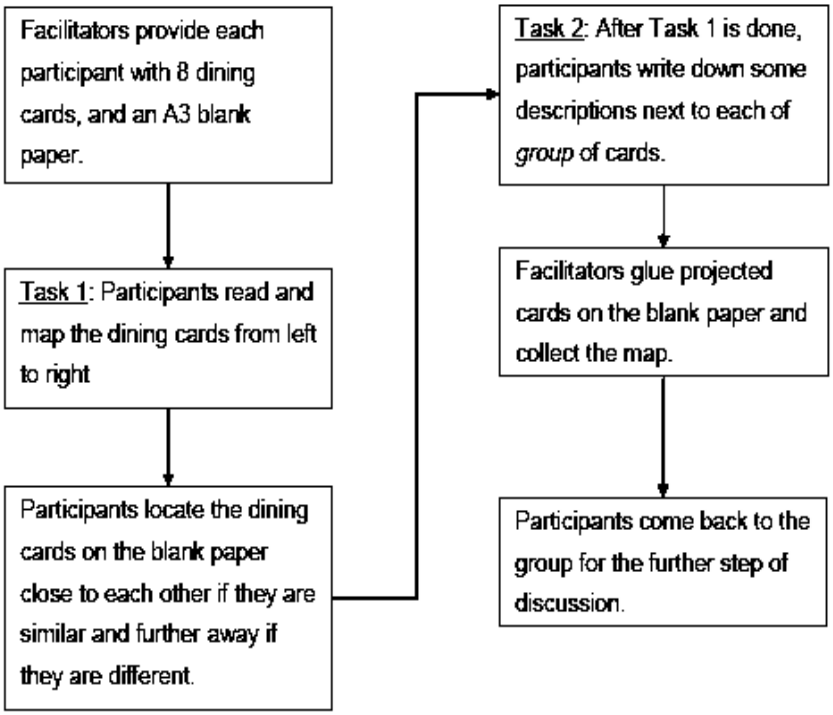


Figure 1 Projective mapping procedures

Participants are individually asked to evaluate eight cards of eight different dining situations. These scenarios are from a previous quantitative vignette study in which 32 vignettes are randomly but systematically separated into four blocks eight scenarios each according to the balanced incomplete block design. To recall this, the default wordings of a vignette are adapted from Ellison and Lusk (2018) and are shown below;

> *"Imagine you have just finished eating dinner [alone/with others] [at home/out at a restaurant]. The meal costs about [100 ฿ (£6)/ 500 ฿ (£30)] per person. You're full, but there is still food left on the table enough for a [half/whole] lunch tomorrow. You [don't/already] have meals planned for lunch and dinner tomorrow."*

The description is based on five attributes with two levels each as shown brackets above as well as in

Table 2 - Attributes and levels

Attributes	Levels
Presence of others during dining	- Alone - With others
Meal cost[1,2]	- 100 ฿ (£6)[3] - 500 ฿ (£30)[4]
Place of meal[1]	- At home - Out at a restaurant
Amount of leftover food[1]	- Half - Whole
Future meal plan[1]	- No plan - With plan

We will hand out this set of cards (example in Figure 2) in a random manner based on those four blocks. Each block will be equally used per group of discussion. For example, if there are eight participants, two people will receive the same set of scenarios. Each participant will be instructed to place the eight cards of dining situations on a blank piece of paper. Dining situations which are perceived as similar to each other will be put next to each other and further away they think the situations are different. The assessment is subjective and entirely based on individual judgement. Afterwards, we will also inform them to add some keywords or descriptions for each group of scenarios. This language used will help participants with the group discussion which is the following activity.

> *"Imagine you have just finished eating dinner alone out at a restaurant. The meal costs about £6 per person. You're full, but there is still food left on the table enough for a whole lunch tomorrow. You already have meals planned for lunch and dinner tomorrow."*

Figure 2 Example of a dining situation card

[1] From Ellison and Lusk (2016)

[2] Cost of meal in each level is comparable using Purchasing Power Parity (private consumption) conversion factor in 2016 from World Bank (2018)

[3] Thai Baht (฿) for Thai samples and GBP (£) for UK samples

3.2.4 Group discussion (60 minutes)

The objective of this post-projective mapping session is to understand rationale behind factors influencing consumer food waste behaviour discussed during the projective mapping. We will ask participants by starting from an overview question about dining and food waste to specific five attributes of our interest: 1) presence of others, 2) place, 3) cost of a meal per person, 4) amount of leftover dinner, and 5) future meal plan. The questions will be semi-structured, and the moderator will ask participants for further clarifications along the conversation if there are any emerged comments. Moderators will try to maintain the dynamics of the conversation by trying balance opportunity of participants to express their opinions.

3.2.5 Closing (10-15 minutes)

Before closing the focus group discussion, we will conclude what we have discussed and we will also give an opportunity for participants to add anything they want to mention. Also, participants can ask questions about the research. Afterwards, participants will be given restaurant vouchers for their help.

4 COMPENSATION

Participants will be compensated for their time each with a restaurant discount voucher. The reward is given to them at the end of the discussion.

5 MATERIALS

Data collection consists of four main materials. First, notes taken during the focus groups discussions. Second, expanded notes collated by research team right after the focus groups. The note takers and moderators will meet and discuss the preliminary information collected (i.e. notes, observed emotion, and projective maps) to agree on the findings because the information is still fresh to recall. Third, focus groups audio and video-recording will be transcribed in the following days. Finally, projected ideas and language from the projective mapping task are also collected.

6 DATA ANALYSIS

The analysis begins after the discussion has been transcribed and added with materials indicated in the previous section. The main analysis method if based on a thematic analysis and using NVIVO on transcript enriched by notes and debriefing. The analysis, which was a qualitative content analysis, will be carried out in six steps:

1. **Recording:** All focus group interviews will be recorded by tape recorders in order to provide a basis for transcribing the discussions.
2. **Transcription:** The focus group discussions will be transcribed. Nonverbal communication will be considered in the transcription process.
3. **Coding:** In a third step, the focus group discussions will be coded. This enabled the discussion to be structured into different themes.
4. **Group specific theme analysis:** After coding, an analysis of the specific issues that arose in each focus group will be conducted.
5. **Comprehensive theme analysis:** The issue-related results of each focus group interview were compared in each case study country in order to identify differences and similarities-
6. **Projective mapping task, notes and debrifing:** the results will be enriched and modelled also based on notes and debriefing prepared during the group discussion.

References

Berg, B. L. & Lune, H. (2012). *Qualitative Research Methods for the Social Sciences* England: Pearson Education Limited.

Dehlholm, C. (2014). Project Mapping and Napping. *In:* Varela, P. & Ares, G. (eds.) *Novel Techniques in Sensory Characterization and Consumer Profiling.* Florida: CRC Press.

Ellison, B. & Lusk, J. L. (2018). Examining Household Food Waste Decisions: A Vignette Approach. *Applied Economic Perspectives and Policy,* 40, 613-631.

Stewart, D. W., Shamdasani, P. N. & Rook, D. W. (2007). *Focus Groups.* The US: Sage Publications, Inc.

World Bank. (2018). *PPP conversion factor, private consumption (LCU per international $).* URL: https://data.worldbank.org/indicator/PA.NUS.PRVT.PP?locations=GB-TH [16 June 2018].

Participants Information Sheet

We would like to invite you to take part in a group discussion for a research study. Before you decide to participate, please read the following information carefully about the research details and what your participation will involve. Feel free to ask if you need more information (contact details are at the end of this information sheet).

Who am I and what is this study about?

My name is Ponjan Pinpart (Prau) and I am a PhD student in Agricultural and Food Economics at the University of Reading. As part of my degree, I am conducting research on consumer food waste behaviour by comparing between British and Thai people. Food waste becoming a global problem and it affects our economy, society, and the environment. People have different reasons to bin food in different situations. This research project particularly aims to understand why people waste food in a during eating situations.

Why have you been chosen?

You are being asked to participate in a research project by joining a focus group discussion. I select my participants who are 18-75 years old, live in the UK and have a British citizenship.

What will happen during the focus group discussion?

You will be asked to attend a group discussion which consists of 6-12 participants. The discussion should take around 1.5 - 2 hours. There will be me, and one or two other academic colleagues who will be facilitating the focus group. We will talk about dining situations and plate waste factors. We are interested in your opinion. So, there is no right or wrong answers. During the activity, we would like to take a video and record your voice. This is just to help us with transcribing afterwards only.

Where will the discussion be done?

The focus group will be held in Frank Parkinson room, Agriculture Building (Building number 59), Whiteknights Campus, University of Reading. Earley Gate, RG6 7BE

What will happen to the results?

We will be looking at common answers between participants and group them together. The findings will be presented in my PhD thesis, conferences and in peer-reviewed academic journals, but your name will NOT be presented.

Confidentiality

Any data you provide will be treated with confidential. The discussion will be recorded and transcribed. However, you will not be identified in the recordings. You will be given a reference number at the beginning of the session and we will use this number to refer to you and your comments. We will not name you in any of our study reports or publications. Additionally, all participants will be asked to respect everyone's confidentiality. We will ask everyone to refer to one another by number such as for example "participant 3".

The video recordings will be typed up by me. Once it is typed up, the recordings will be permanently deleted straight away. Any electronic form of typed up files will be stored on a password protected computer. Paper notes will be stored in a locked cabinet. I am the only one who has access to these materials.

What are the benefits of taking part in this study?

We will provide participants with a restaurant discount voucher. You will get to share your opinions about food waste. We hope that the results from the discussion will be helpful to our society in terms of food waste reduction and prevention.

Who has reviewed this study?

This application has been reviewed according to the procedures specified by the University Research Ethics Committee and has been given a favourable ethical opinion for conduct.

Do you have to take part?

No. It is entirely voluntary and up to you if you want to take part. If you agree to take part in the study but later decide to withdraw, it is totally fine. Please simply let me know and I will take you off the list. During and after the discussion, it will not be possible to withdraw because of the nature of the focus group of the discussion.

Want to join?

If you are interested in participating in the focus group discussion or if you have any enquiries, please contact me, Ponjan Pinpart (email: ponjan.pinpart@pgr.reading.ac.uk or phone: 0118 378 7703). In your visit, I will give you this information sheet.

By joining the focus group discussion/completing the session you are acknowledging that you understand the terms of participation and that you consent to these terms.

Thank you for your help.

Ponjan Pinpart (Prau)

Contact details

School of Agriculture, Policy, and Development, University of Reading Agriculture Building Earley Gate, Whiteknights Road, PO Box 237, Reading, RG6 6AR, United Kingdom Phone: +44 (0) [redacted] E-mail: ponjan.pinpart@pgr.reading.ac.uk

Supervisors contact details

Dr Daniele Asioli
School of Agriculture, Policy, and Development
University of Reading, Agriculture Building, Earley Gate
Whiteknights Road, PO Box 237, Reading, RG6 6AR
United Kingdom
Phone: +44 (0) [redacted] E-mail: d.asioli@reading.ac.uk

Prof. Kelvin Balcombe
School of Agriculture, Policy, and Development
University of Reading Agriculture Building Earley Gate
Whiteknights Road, PO Box 237, Reading, RG6 6AR
United Kingdom,
Phone: +44 (0) [redacted] E-mail: k.g.balcombe@reading.ac.uk

Online Screening Questionnaire

Hello, my name is Ponjan Pinpart (Prau). I am a PhD student at the University of Reading, Department of Applied Economics and Marketing. I would like to invite you to participate in a research study for my PhD thesis. The study is about consumer food waste behaviour focusing on factors affecting decision in wasting food in a meal setting. Participants of the study will be asked to discuss this topic in a small group of 6-12 people. I guarantee that all data and information collected during the group activity are analysed anonymously.

Could I now ask you some questions in order to find out if you are within the group of consumers we are looking for?

____ Yes ____ No (If no, thank respondent and close the screening process)

Are you currently living in the UK?

____ Yes ____ No (If no, thank respondent and close the screening process)

Do you have British citizenship?

____ Yes ____ No (If no, thank respondent and close the screening process)

How old are you?

____ Younger than 18 years old (If yes, thank respondent and close the screening process) ____ Between 18-46 years old ____ Between 47-75 years old ____ 76 years old and older (If yes, thank respondent and close the screening process) ____ Prefer not to say (If yes, thank respondent and close the screening process)

What is your gender?

____ Male ____ Female

_____ Prefer not to say (If yes, thank respondent and close the screening process)

Focus Group Discussion Guideline

This guideline is for the moderator to use for facilitating the focus group discussions (FGD). Each group will have seven stages:

1. Registration
2. Introduction and warm up
3. Consumer food waste – general behaviour
4. Projective mapping individual task
5. Project mapping discussion
6. Consumer food waste – specific context of commensality, place of dining, cost, amount, and future meal plan.
7. Ideal situations -when to save food
8. Closing

In each session, scripts to be read out by the moderator will be in a “quotation mark”.

Key questions are main issues we want to discover. Other emerged questions and ideas can be raised if they are suitable in the discussion flow. This will be put in a text box in each stage.

Stage 1) Registration

- Welcome participants
- Provide them with a hard copy of a participant information sheet with an individual reference number
- Provide a name tag or a tag to indicate each individual number for participants to call each other anonymously.

Stage 2) Introduction and warm-up (15 minutes):0:15 mins

Objective of this stage is to introduce ourselves and let participants introduce themselves, inform about the study and rules about today’s FGD.

- Introduce the purposes of the study and team members

“Good evening everyone, first of all, I would like to thank everyone for taking part in this study. This discussion is about your experiences and thoughts about wasting food particularly food during a meal time. If you would like to know more about the study, we are happy to provide you the summary of the project at the end of the discussion.

My name is …….. and I am moderating today's session. These are …… and …….. who are assisting me. My role is a moderator, so I will direct the conversation by asking introduce topics and keep the conversation going to get your opinion. Our aim is to understand your opinions and views and it is important to every participants has a chance to speak or express your opinion. Finally, there is no right or wrong answers."

- Explain what will happen

"The discussion consists in 3 main steps. First step, we will have a task for everyone to do individually. Second step, we will come back as a group to discuss altogether. As mentioned in the information sheet, I believe you have received during the screening process, we will audio and video recording the discussion. This will help the conversation go more smoothly without us pausing to take notes. Final step, we will close today session.

- Participant introduce themselves

Key question: *"Now we would like to ask everyone to give us a short introduction about yourself around the table using the snowball technique (name or nickname, job, where they live). Since this is an anonymous event, we would like to ask everyone to address each other with a participant number as shown on each*

Go around the table to let everyone introduce themselves. If someone is happy to use their own names, it is also fine. We confirm that the data will be analysed anonymously in the end.

- Ice-breaker question

Key question: *When you hear the word "food waste", what comes first to your mind?*

Other supportive questions: *Which associations you make about the term "food waste"? Which is your experience during meals at home or out of home about food waste? What are your feelings (i.e., good, bad, etc.)?*

Stage 3) Consumer Food waste – General Behaviour (15 minutes): 30 mins

The objectives of this session are to warm up participants and start to introduce the topic to further discussion about food waste.

Key questions are about general experience in creating leftovers or wasting food from a meal.

"Let's start with the first question, tell me about overall your food waste experience after having lunch or dinner.."

"Do you waste food after meals? If yes, why? Do you like it? Which are your thoughts when decide to waste or not waste food?

"What do you think or feel when you have to waste that food?"

Other possible probing questions:

When other people near you like your family or friends have leftovers and bin it, what do you think or feel?

Has anyone told you why we should not waste food?

How strong you feel we should save food and finish the food as much as we can?

Stage 4) Projective Mapping Individual Task (20 minutes): 50 mins

Objective of this stage is to familiarise participants with the food waste context of the study by using the projective mapping technique as a starting point of a further conversation in the following stage.

- Explain task

Key question: Which cards are perceived as similar to each other and which cards are perceived as different from each other?

"Before we start the group discussion, I would like you to do an individual activity. I am going to split you to an individual table to do this task. You will be provided with 8 cards of 8 different dining situations and a large piece of blank paper. We would like you to place the cards on the piece of paper, the cards with stories that you find more similar

to each other placed closer together, and the stories you find less similar placed further apart from each other. The criteria you choose to group or space apart the items is fully up to you, and there is no right or wrong answer."

"Once you have placed the items on the paper, we would like you to write a few words or comments beside cards or groups of cards which express how you feel, how you describe the cards, the differences about them. Once you are done, tape the cards in place and let us know."

Key question: Why did you put the cards in this order/position? Please, explain and describe with a words or sentences each cards and why in terms of food waste behaviour (i.e. how do you feel in this eating situations, differences, etc.)

EXAMPLES: Imagine you have to map and describe these 6 cards:

A woman, wears a blue dress, going to a party with her

A woman wears a black dress, going to a restaurant with her family

A man wears a black shirt, going to a party with his

A man wears a blue shirt, going to a restaurant with his family

A man wears a black shirt, going to a restaurant with her friends

A woman wears a black dress, going to a party with her family

- Provide examples:

There is no right or wrong answers and there could be more than 1 outcomes. Let's see two possibilities

In the examples below, when describe the cards try to be a bit more creative with comments like positive or negative comments, put adjectives, etc.

A woman, wears a blue dress, going to a party with her friends

A man wears a black shirt, going to a party with his family

Women in a party

A man in a party

A woman wears a black dress, going to a party with her family

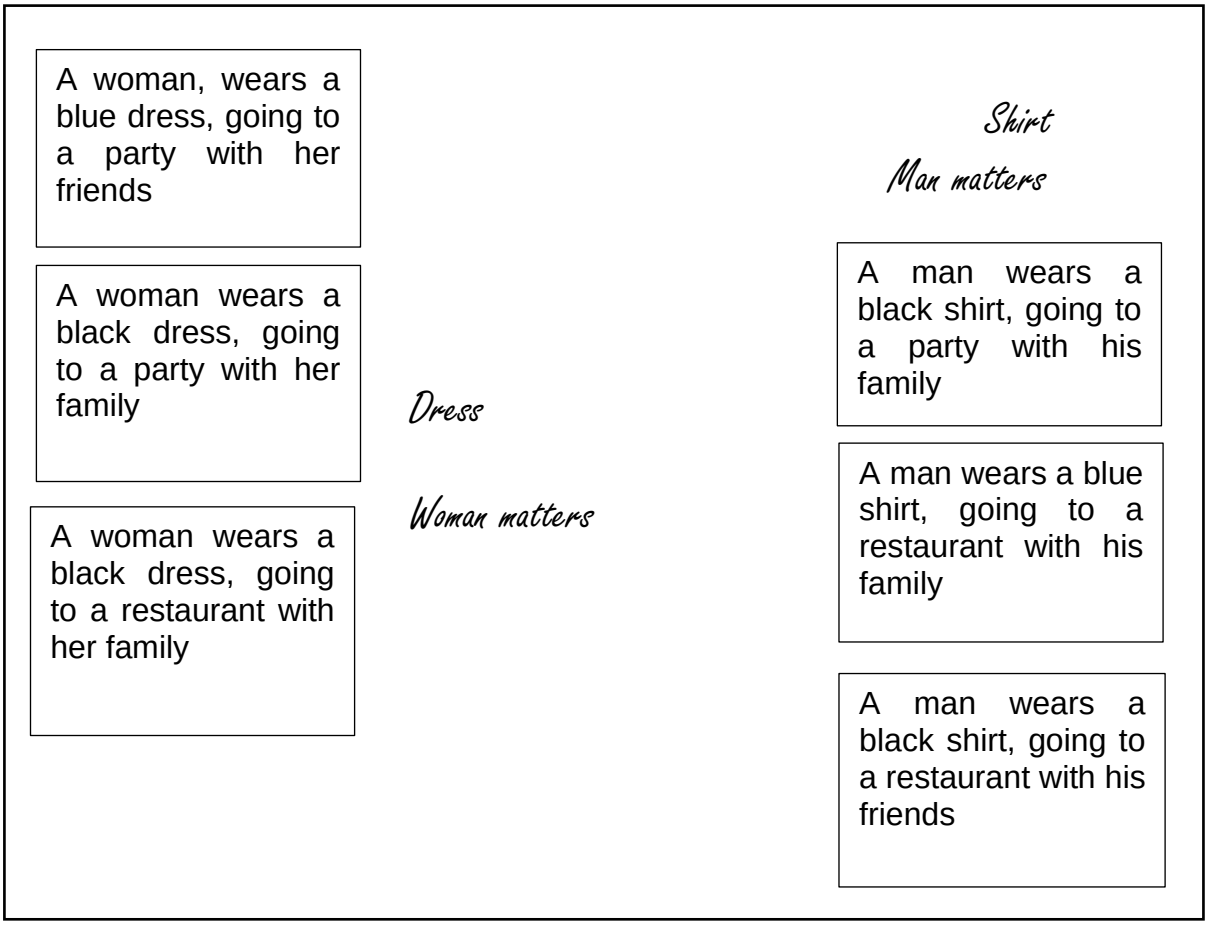
A man wears a blue shirt, going to a restaurant with his family

Men in a restaurant

A woman in a restaurant

A woman wears a black dress, going to a restaurant with her family

A man wears a black shirt, going to a restaurant with his friends



8 card stories to be used for this project mapping session will be randomly picked from one of the four blocks as the results of combinations from the scenarios below:

> Imagine you just finished eating dinner [alone/with others] [at home/ out in a restaurant]. The meal cost about [£6/ £30] per person. You're full, but there is still food left on the table – enough for [a half/ a whole] lunch tomorrow. Assuming you [don't/ already] have meals planned for lunch and dinner tomorrow.

Give participants 15 minutes to do activity. Check in with participants at 15 minutes, and if they have not finished give them 5 extra minutes. After these 5 minutes, moderator and assistants kindly ask them if they could finish quickly, provide a solar tape or a blue tag to stick the cards with the blank paper, and ask everyone to sit together as a group.

Stage 5) Project Mapping Discussion (25 minutes): 1.15 hrs

When everyone is back to the group, "*I can see that you have created different diagrams, that is interesting. I would like to hear from each of you how you organised the cards and why*."

- Moderator asks the person on their right to start showing their map and explaining their reasoning, then go around the circle.

"Why do you comment this way? And Why these cards are grouped together or further away?"

- Collect the maps for documentation and data collection after the discussion is over.

Stage 6) Consumer Food waste – Specific Context of Commensality, Place of Dining, Cost, Amount, and Future Meal Plan. (25 minutes): 1.40 hrs

The objective of this section is to probe into more specific rationale behind each factors

Key questions are to ask how each of the factors affect consumer food waste behaviour or decision to keep the remaining food or to waste the food.

"Please take a moment to think about yourself in a dining situation. There are occasions when you can finish all food and do not have to worry about the leftovers. However, for some reasons, there are times that you cannot finish all the food and have to decide what to do with the food."

1. *"What about cost/price of the meal either you prepare at home or eating out, why cost/price is important for food being wasted or not wasted?" In which occasions/situations is important the cost/price of the meal into decision of food waste or not? How the cost/price of the meal affects your decision to waste or not waste food?*
2. *"Let's talk about...presence of others during a meal/ place/ amount/ meal plan....Why presence of others people is important or not important for food being wasted or not wasted during eating situations? How do you feel to waste food with eating with others people? With which people you waste more or less food after a meal like parents, friends, and colleagues, and why?*
3. *..Why place of dining is important or not important for you during meals being wasted or not wasted? How do you feel to waste food when eating out or at home? Is there any difference between in the decision to waste or not waste food if you have a meal at home or out of home?*
4. *…Why the amount of meal leftovers is important or not important for being wasted or not wasted? How do you feel to waste food when the amount of leftovers is little or large? Which considerations affect your decision to waste or not waste meals based on the amounts of leftover?*
5. *…Why future meal plan on the following day is important for you when decide for your meal to being wasted or not wasted?" How do you feel to waste food when you already have plan for the next meal or when you have no plan? Which considerations affect your decision to waste or not waste meals based on your meal plan for the following day?*

Are there other factors that affect your decision to waste or not waste food during meal situations?

of interest in plate waste: commensality, place of dining, cost, amount, and future meal

plan.

Other possible probing questions to compare between levels of factors:

Are there any differences between wasting food at home and at a restaurant?

Are there any differences between eating alone and eating with others in terms of creating food waste?

Are there any differences between cheap and expensive food to be wasted?

Are there any differences between the amount of leftovers?

Are there any differences between your future meal plan to make you decide differently?

Stage 7) Ideal situations (15 minutes): 1.55 hrs

Is there any situations which you will definitely will save your food after a meal? Specifically, could you describe your ideal eating situations where you likely save your food in terms of cost/price, place, type of food, time of the day, etc.?

- *Is there any situations which you will definitely will waste your food after a meal? Specifically, could you describe your ideal eating situations where you likely waste your food in terms of cost/price, place, type of food, time of the day, etc.?*

Stage 8) Closing (5minutes): 2.00 hrs

The objective is this step is to give participants a chance to add more details particularly those who have been quite quiet.

“Before we close the discussion, I would like you to give you a final opportunity to add anything you still want to mention”

- Leave time for people to add comments particularly try to encourage those who have been quiet.
- Thank participants
- Provide vouchers and sign off to confirm the receipt
- Provide summary of the project

University of Reading

HAVE YOUR SAY AND
GET A RESTAURANT VOUCHER
FOR YOUR OPINIONS

PARTICIPANTS NEEDED

FOR CONSUMER FOOD WASTE RESEARCH:

FOCUS GROUP DISCUSSION

Are you….

- ☑ British citizen
- ☑ Living in the UK
- ☑ Male / Female
- ☑ 18-75 years old

✓ Attend a discussion meeting **either** on Thu 16th May **or** Wed 22nd May 16.00-18.00
Agriculture Building, U of Reading

✓ Share your thoughts in a group discussion

To learn more or sign up:
email Ponjan Pinpart at ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Consumer Food Waste Research
ponjan.pinpart@pgr.reading.ac.uk

Appendix 12 - Focus Group Discussion Protocol and Questions (Thai)

รายละเอียดสำหรับผู้เข้าร่วมกิจกรรมการสนทนากลุ่ม

ดิฉันชื่อ นางสาวพรจันทร์ พิณพาทย์ หรือ แพรว (นักวิจัย) เป็นนักศึกษาระดับปริญญาเอก สาขาวิชาเศรษฐศาสตร์การเกษตร และอาหาร (Agricultural and Food Economics) มหาวิทยาลัยเรดดิ้ง (University of Reading) ประเทศอังกฤษ

กิจกรรมนี้เป็นส่วนหนึ่งของปริญญา และเป็นการศึกษาเกี่ยวกับพฤติกรรมผู้บริโภค กับขยะประเภทอาหาร และอาหารเหลือทิ้ง อีกทั้งยังเป็นการศึกษาเพื่อเปรียบเทียบความแตกต่างกันระหว่างผู้บริโภคชาวไทย และชาวอังกฤษ

ขยะอาหารหรืออาหารเหลือทิ้งนั้นเริ่มเป็นปัญหาไปทั่วโลก และมีผลต่อเศรษฐกิจ สังคม และสิ่งแวดล้อม คนแต่ละคนก็มีเหตุผลต่างๆกันไปถึงการทิ้งอาหาร ในสถานการณ์ต่างๆ งายวิจัยนี้มีจุดประสงค์ที่จะทำความเข้าใจว่าเหตุใดคนเราจึงได้ตัดสินใจทิ้งอาหาร หรือมีอาหารเหลือทิ้งในแต่ละมื้ออาหาร

ท่านได้รับเชิญเข้าร่วมถ่ายทอดความคิดเห็น และแบ่งปันประสบการณ์ในการรับประทานอาหารของท่านเพื่อเป็นตัวแทนกลุ่มผู้บริโภคคนไทย ผ่านการสนทนากันแบบกลุ่ม ในเอกสารนี้จะมีรายละเอียดเกี่ยวกับงานวิจัย และการสนทนากลุ่มที่จะจัดขึ้น ดังนั้น กรุณาอ่านเอกสารนี้อย่างละเอียดก่อนที่ท่านจะตัดสินใจเข้าร่วม โดยท่านสามารถสอบถามข้อมูลเพิ่มเติมได้หากท่านต้องการตามรายละเอียดติดต่อในส่วนท้ายของเอกสารนี้

หลักเกณฑ์ในการเลือกผู้เข้าร่วมการสนทนากลุ่ม

ผู้เข้าร่วมจะต้องมีอายุอยู่ในช่วง 18-75 ปี ไม่จำกัดเพศ อาศัยอยู่ในประเทศไทย และมีสัญชาติไทย

ลักษณะการสนทนากลุ่ม

ท่านจะได้รับเชิญเข้าร่วมการสนทนากลุ่ม ที่ประกอบไปด้วยสมาชิกในการสนทนาจำนวนประมาณ 6-12 คน โดยการสนทนาจะใช้ระยะเวลาประมาณ 2 ชั่วโมง นอกจากผู้เข้าร่วมสนทนาแล้วยังมี ดิฉัน (นักวิจัย) และผู้ช่วยนักวิจัยอีกสองท่านซึ่งจะช่วย เอื้ออำนวยความสะดวกระหว่างการสนทนา

ดิฉันสนใจรับฟังความคิดเห็นของท่าน ดังนั้น สิ่งที่ท่านได้สนทนา แบ่งปันข้อคิดเห็น และประสบการณ์จะไม่มีผิด หรือถูก เราจะมีการบันทึกเสียง และบันทึกเป็นภาพเคลื่อนไหวเพื่อช่วยให้การสนทนาเป็นไปอย่างราบรื่น ไม่มีอุปสรรค และให้เราเก็บข้อมูล และถอดความได้อย่างถูกต้องภายหลัง

สถานที่

ตึกสำนักบริการคอมพิวเตอร์ มหาวิทยาลัยเกษตรศาสตร์ (จะทำการยืนยันอีกครั้ง)

การวิเคราะห์ข้อมูล

เราจะพิจารณาแนวทางของความคิดเห็นหรือคำตอบระหว่างผู้เข้าร่วมสนทนา โดยข้อมูลที่ได้จากการวิเคราะห์จะใช้ในวิทยานิพนธ์ของดิฉัน งานประชุมวิชาการ และวารสาร แต่ชื่อของท่านจะไม่ถูกเปิดเผยในเอกสารใดๆเลยความลับของข้อมูลที่ท่านให้ข้อมูลรายละเอียดส่วนตัวเกี่ยวกับตัวท่านให้จะไม่ถูกเปิดเผยที่ใด บทสนทนาจากการสนทนากลุ่มจะถูกบันทึกและถอดความ แต่จะไม่มีการอ้างอิงถึงข้อมูลส่วนตัวของท่าน ในวันที่จัดการสนทนากลุ่ม ท่านจะได้รับป้ายชื่อ ซึ่งท่านสามารถใช้ชื่อเล่น ชื่อสมมติ หรือ หมายเลขเพื่อให้ผู้ร่วมสนทนาอ้างอิงถึงท่านในระหว่างการสนทนา และในรายงานการวิจัย เราจะใช้หมายเลขในการอ้างอิงถึงท่าน และความคิดเห็นของท่าน ขอความกรุณาให้ท่านเรียกท่านสมาชิกการสนทนากลุ่มท่านอื่นๆด้วยชื่อเล่น หรือชื่ออื่นๆที่ปรากฏที่ป้ายชื่อที่ทุกท่านจะได้รับ ระหว่างการสนทนาจะมีการบันทึกเสียง และภาพเคลื่อนไหว ดิฉันจะเป็นคนถอดความบทสนทนาที่บันทึกออกมาเป็นตัวหนังสือ เมื่อทำการพิมพ์ออกมาเป็นตัวหนังสือเสร็จเรียบร้อยแล้ว ดิฉันจะทำการลบ

เทปที่บันทึกไว้อย่างถาวรโดยทันทีไฟล์อิเลคโทรนิกที่ใช้เก็บรายละเอียดบทสนทนาเป็นตัวหนังสือจะถูกบันทึกเก็บในคอมพิวเตอร์ที่ใช้พาสเวิร์ดในการเข้าถึง กระดาษที่ใช้ในการจดบันทึกระหว่างการสนทนาจะถูกเก็บในตู้ที่มีการล็อคด้วยกุญแจ และดิฉันเป็นคนเดียวที่สามารถเปิดได้

ประโยชน์ที่ท่านจะได้รับ

ท่านจะได้รับโอกาสในการแสดงความคิดเห็นเกี่ยวกับการรับประทานอาหาร อาหารเหลือทิ้ง ขยะประเภทอาหาร การกินทิ้งขว้าง ซึ่งเราหวังว่าสังคม หรือผู้กำหนดนโยบายในสังคม จะได้รับผลประโยชน์จากงานวิจัยนี้ในลำดับถัดไปเพื่อเป็นแนวทางในการจำกัด หรือลดปริมาณขยะประเภทอาหารที่โดยแท้แล้วนั้นสามารถหลีกเลี่ยงได้ หรือลดปริมาณลงได้ นอกจากนี้แล้ว เรายังมีคูปองลดราคาร้านอาหาร Loving Hut สาขาพระราม 3 ให้ท่านเพื่อเป็นการตอบแทนสำหรับเวลา และความคิดเห็นของท่าน

การตรวจสอบแบบสอบถามและขั้นตอนการวิจัย

แบบสอบถาม และกระบวนการวิจัยนี้ ได้ผ่านการพิจารณาและรับรองโดยคณะกรรมการ University of Reading Research Ethics Committee ก่อนที่ดิฉันจะทำการติดต่อท่านเพื่อเข้าร่วม และดำเนินการวิจัย หากท่านมีคำถามเกี่ยวกับสิทธิ์ของผู้เข้าร่วมงานวิจัย ท่านสามารถติดต่อคณะกรรมการนี้ได้ทางอีเมลล์ sapdethics@reading.ac.uk

ท่านจำเป็นจะต้องเข้าร่วมหรือไม่

ไม่ ท่านไม่จำเป็นจะต้องเข้าร่วม การเข้าร่วมการสนทนากลุ่มจะเป็นไปตามความสมัครใจของท่าน และขึ้นอยู่กับท่านว่าท่านอยากจะเข้าร่วมหรือไม่ หากท่านตอบตกลงที่จะเข้าร่วมแล้ว และในเวลาต่อมาท่านต้องการที่จะถอนตัว ท่านสามารถทำได้โดยการแจ้งให้ดิฉันทราบ และดิฉันจะทำการถอดชื่อท่านออกจากรายชื่อผู้เข้าร่วม

อย่างไรก็ตามหากท่านเข้าร่วม และการสนทนาได้ดำเนินไปแล้ว ท่านจะไม่สามารถถอนตัวได้เนื่องจากลักษณะของการสนทนาที่นักวิจัยได้ยินความเห็นของท่านไปแล้ว และไม่สามารถลบสิ่งที่ได้ยินไปแล้วได้

วิธีเข้าร่วม

หากท่านสนใจที่จะเข้าร่วมการสนทนากลุ่มนี้ กรุณาติดต่อนางสาวพรจันทร์ พิณพาทย์ (แพรว) ได้ทางอีเมลล์ ponjan.pinpart@pgr.reading.ac.uk หรือทางไลน์ Line ID: prauponjan ติดต่อ เมื่อท่านได้เข้าร่วมการสนทนากลุ่มแล้วถือว่าท่านรับทราบ และยอมรับข้อตกลง และเงื่อนไขที่กล่าวไว้ข้างต้น

ขอขอบพระคุณทุกท่านเป็นอย่างสูง

นางสาวพรจันทร์ พิณพาทย์ (แพรว)

<u>รายละเอียดการติดต่อ</u>

School of Agriculture, Policy, and Development

University of Reading

Agriculture Building

Earley Gate, Whiteknights Road

PO Box 237

Reading RG6 6AR

United Kingdom

LineID: prauponjan

อีเมลล์: ponjan.pinpart@pgr.reading.ac.uk

ที่ปรึกษา

Dr Daniele Asioli

School of Agriculture, Policy, and Development

University of Reading

Agriculture Building

Earley Gate, Whiteknights Road

PO Box 237

Reading RG6 6AR

United Kingdom

โทร: +44 (0) [redacted]

อีเมลล์: d.asioli@reading.ac.uk

Prof. Kelvin Balcombe

School of Agriculture, Policy, and Development

University of Reading

Agriculture Building

Earley Gate, Whiteknights Road

PO Box 237

Reading RG6 6AR

United Kingdom

โทร: +44 (0) [redacted]

อีเมลล์: k.g.balcombe@reading.ac.uk

แบบสอบถามออนไลน์ใช้ในการคัดกรอง

สวัสดีค่ะ ดิฉัน นางสาวพรจันทร์ พิณพาทย์ หรือ แพรว เป็นนักศึกษาปริญญาเอก ภาควิชา Applied Economics and Marketing มหาวิทยาลัยเรดดิ้ง สหราชอาณาจักร ขอเชิญชวนทุกท่านเข้าร่วมการสนทนากลุ่ม ซึ่งเป็นส่วนหนึ่งในงานวิจัยสำหรับปริญญานี้ การศึกษานี้เกี่ยวข้องกับพฤติกรรมผู้บริโภคทางด้านอาหารเหลือทิ้ง โดยเน้นศึกษาปัจจัยที่ส่งผลต่อการตัดสินใจทิ้งอาหารที่เหลือของมื้ออาหาร ดิฉันจะทำการชวนผู้เข้าร่วมการศึกษาสนทนากันในหัวข้อที่เกี่ยวข้องนี้กับผู้เข้าร่วมท่านอื่นๆในกลุ่มที่มีขนาดประมาณ 6-12 คน ดิฉันขอยืนยันว่าข้อมูลที่ท่านให้ทั้งหมดจะถูกเก็บเป็นความลับ หากท่านสนใจเข้าร่วม เพื่อเป็นการตรวจสอบว่าท่านมีคุณลักษณะตรงกับผู้บริโภคที่ต้องการสำหรับการศึกษาของเรา ดิฉันขอถามคำถามคัดกรอง จำนวน **4** ข้อได้หรือไม่

____ ได้ ____ ไม่ได้ **(**หากตอบว่าไม่ได้, ขอบคุณ และจบการถามคำถาม)

ท่านอาศัยอยู่ในประเทศไทยหรือไม่

____ ใช่ ____ ไม่ใช่ **(**หากตอบว่าไม่ได้, ขอบคุณ และจบการถามคำถาม)

ท่านมีสัญชาติไทยหรือไม่

____ ใช่ ____ ไม่ใช่ **(**หากตอบว่าไม่ได้, ขอบคุณ และจบการถามคำถาม)

อายุ

____ ต่ำกว่า 18 ปี **(**หากตอบข้อนี้, ขอบคุณ และจบการถามคำถาม)

____ ระหว่าง 18-46 ปี

____ ระหว่าง 47-75 ปี

____ 76 ปี และมากกว่า **(**หากตอบข้อนี้, ขอบคุณ และจบการถามคำถาม)

____ เลือกที่จะไม่ตอบ **(**หากตอบข้อนี้, ขอบคุณ และจบการถามคำถาม)

เพศ

____ชาย

____ หญิง

_____ เลือกที่จะไม่ตอบ **(**หากตอบข้อนี้, ขอบคุณ และจบการถามคำถาม)

ข้อแนะนำขั้นตอนและรายละเอียดสำหรับการสนทนากลุ่ม

ข้อแนะนำนี้สำหรับให้ผู้ดำเนินการสนทนากลุ่มให้อ้างอิงถึง โดยแต่ละกลุ่มสนทนาจะมีด้วยกัน **8** ขั้นตอนใหญ่ ดังนี้

- ลงทะเบียน
- เกริ่นนำ และ warm-up
- พฤติกรรมผู้บริโภคทางด้านอาหารเหลือทิ้ง - ทั่วไป
- กิจกรรมเดี่ยว Projective mapping
- สนทนากลุ่มเกี่ยวกับ Project mapping
- พฤติกรรมผู้บริโภคทางด้านอาหารเหลือทิ้ง - เฉพาะเจาะจงทางปัจจัยทั้ง 5 ที่ศึกษา คน สถานที่ ราคา ปริมาณ และแผนมื้ออาหาร
- สถานการณ์ในอุดมคติ
- ปิดการสนทนา

ในแต่ละขั้นตอน ถ้ามีคำพูดที่จะให้ผู้ดำเนินการสนทนากล่าว คำพูดนั้นจะอยู่ใน “เครื่องหมายคำพูด”

ขั้นตอนที่ 1) ลงทะเบียน

คำถามหลักจะอยู่ในกล่องข้อความ และเป็นสิ่งที่ต้องการค้นหาคำตอบ คำถามอื่นๆสามารถถามได้หากเหมาะสมต่อลำดับขั้นการสนทนา และเป็นไปอย่างราบรื่น

- ต้อนรับผู้เข้าร่วมการสนทนากลุ่ม
- มอบเอกสารรายละเอียดสำหรับผู้ร่วมการสนทนากลุ่ม พร้อมหมายเลขอ้างอิง
- แจกป้ายชื่อ หรือป้ายระบุหมายเลขอ้างอิงของแต่ละคน

ขั้นตอนที่ 2) เกริ่นนำ และ warm-up (15 นาที):0:15 mins

จุดประสงค์เพื่อแนะนำทีมนักวิจัย, เปิดโอกาสให้ผู้เข้าร่วมสนทนากลุ่มได้แนะนำตัวเอง และ ผู้ดำเนินการสนทนาอธิบายเกี่ยวกับงานวิจัย และการสนทนากลุ่มในวันนี้

- นำเสนอจุดประสงค์ของการศึกษา และแนะนำทีมนักวิจัย

“สวัสดีค่ะทุกคน ก่อนอื่นต้องขอขอบคุณทุกท่านที่ได้ตกลงเข้าร่วมในการศึกษาครั้งนี้ การสนทนากลุ่มนี้จะเกี่ยวข้องกับประสบการณ์ และความคิดเห็นของท่านที่เกี่ยวข้องกับการทิ้งอาหาร หรือ การมีอาหารเหลือทิ้งระหว่างมื้ออาหาร ถ้าหากท่านต้องการสอบถามเพิ่มเติมเกี่ยวกับงานวิจัยนี้ เราสามารถให้รายละเอียดเพิ่มเติมได้หากต้องการ

ดิฉันชื่อ ..... เป็นผู้ดำเนินการสนทนาในวันนี้ และนี้ก็คือ ..... และ .....ที่จะมาช่วย. หน้าที่สำหรับผู้ดำเนินรายการก็คือจะนำทางบทสนทนา โดยการถามคำถามที่กำหนดไว้ และพยายามประคองบทสนทนาให้ต่อเนื่องเพื่อได้ทราบถึงความคิดเห็นของท่าน จุดประสงค์

ของเราคือต้องการได้ ฟังทัศนคติของท่าน และสิ่งที่สำคัญคือการที่ทุกท่านมีโอกาสได้แสดงความคิดเห็นเท่าๆกัน ดังนั้นจึงไม่มีคำตอบใดที่เป็นคำตอบที่ถูกหรือผิด"

- อธิบายสิ่งที่จะเกิดขึ้น

"ในวันนี้ จะมีส่วนของการสนทนาใหญ่ๆ 3 ส่วน ส่วนแรกเราจะ พูดคุยเกี่ยวกับอาหาร การกิน และการทิ้งอาหารเหลือ หลังจากนั้นมีจะกิจกรรมเดี่ยวให้ทำ หลังจากนั้นเราค่อยกลับมารวมกันเพื่อสนทนากลุ่ม ก่อนที่จะปิดการสนทนาในวันนี้

จากที่ได้แจ้งไปแล้วตั้งแต่ขั้นตอนคัดกรอง เรามีอัดวิดิโอเพื่อช่วยให้เราเก็บข้อมูล และสนทนาได้อย่างราบรื่นโดยไม่ต้องเสียเวลาหยุดเพื่อจดบันทึก"

- ผู้เข้าร่วมสนทนาแนะนำตัวเอง

คำถามหลัก: *"แต่ก่อนอื่นตอนนี้เราจะเปิดโอกาสให้ทุกท่านแนะนำตัวเอง เริ่มจากท่านนี้แล้วเมื่อท่านแนะนำเสร็จให้เลือกว่าท่านจะให้ใครแนะนำเป็นคนถัดไป ท่านอาจจะบอกชื่อท่าน และท่านทำงานที่ไหน"*

เวียนไปรอบโต๊ะเพื่อให้ทุกคนได้แนะนำตัวเอง ถ้าหากว่าท่านใดสะดวกใจที่จะใช้ชื่อของตัวเองก็ย่อมทำได้ แต่ต้องยืนยันอีกครั้งว่าสุดท้ายแล้วชื่อจะไม่ถูกเปิดเผย และข้อมูลของทุกท่านจะถูกปิดเป็นความลับ

- Ice-breaker question

คำถามหลัก: *"เมื่อเอ่ยถึงคำว่า ขยะอาหาร หรืออาหารเหลือทิ้ง ท่านนึกถึงอะไรเป็นสิ่งแรกๆ ท่านเชื่อมโยงกับเรื่องใด หรือคิดอะไรบ้างเมื่อได้ยินคำนี้"*

คำถาม: ช่วยเล่าประสบการณ์ของท่านที่เกี่ยวกับอาหารเหลือ ระหว่างมื้ออาหารที่บ้าน หรือ เวลาทานอาหารนอกบ้าน ท่านรู้สึกอย่างไร (เช่น รู้สึกดี แย่ ฯลฯ)

ขั้นตอนที่ 3) พฤติกรรมผู้บริโภคทางด้านอาหารเหลือทิ้ง - ทั่วไป (15 minutes): 0.30 mins

จุดประสงค์ของขั้นตอนนี้คือต้องการอุ่นเครื่องผู้ร่วมสนทนา และชักนำเข้าสู่หัวข้อทางด้านอาหารเหลือทิ้ง

คำถามอื่นๆที่สามารถถามได้ถ้าเหมาะสม

คำถามหลัก เกี่ยวกับประสบการณ์โดยทั่วไปในการทิ้งเศษอาหาร หรือ อาหารจากมื้ออาหาร

"เราเริ่มต้นคำถามกันด้วยคำถามทั่วๆไป ให้ท่านเล่าประสบการณ์การมีอาหารเหลือทิ้งของท่านในแต่ละมื้อ เช่น มื้อ กลางวัน หรือ มื้อเย็น"

"แต่ละมื้อ คุณมีอาหารเหลือทิ้งหรือไม่ ถ้ามี เพราะเหตุใด ท่านรู้สึกอย่างไร ชอบ ไม่ชอบ ท่านตัดสินใจอย่างไร ว่าอะไร หรือเมื่อไหร่จะเก็บ หรือจะทิ้ง"

"ท่านรู้สึก หรือ คิดเห็นอย่างไรเวลาท่านทิ้งอาหาร"

เมื่อคนใกล้ๆตัวท่าน เช่นคนในครอบครัว หรือเพื่อน กินอาหารแล้วมีอาหารเหลือทิ้ง ท่านคิดอย่างไร หรือ รู้สึกอย่างไร

มีใครบอกท่านหรือไม่ว่าคนเราไม่ควรทิ้งอาหาร หรือกินทิ้งกินขว้าง

ความรู้สึกของท่าน ท่านจริงจังแค่ไหนกับคำพูดที่ว่าคนเรา ควรกินอาหารให้หมด ไม่หมดก็เก็บไว้กินวันหลัง ไม่ควรทิ้งอาหาร

ขั้นตอนที่ 4) กิจกรรมเดี่ยว Projective Mapping (20 นาที) :0.50 mins

จุดประสงค์ของขั้นตอนนี้นั้นเพื่อให้ผู้เข้าร่วมสนทนาคุ้นเคยกับหัวข้ออาหารเหลือทิ้ง โดยการใช้เทคนิค projective mapping technique เป็นจุดเริ่มต้นสำหรับส่วนต่อๆไป

- อธิบายกิจกรรม

คำถามหลัก: การ์ดแบบไหนบ้างที่ท่านเห็นว่าเหมือนกัน หรือ แตกต่างกัน

“เรามีกิจกรรมเล็กๆให้ทุกท่านทำด้วยตัวเองก่อนเพื่อเป็นการยืดเส้นยืดสาย ดิฉันจะขอให้ทุกท่านทำกิจกรรมต่อไปแบบตัวใครตัวมัน โดยแพรวจะมีการ์ดให้ 8 การ์ด ซึ่งในการ์ดแต่ละการ์ดนี้ จะมีรายละเอียดสถานการณ์การรับประทานอาหารแตกต่างๆกันไป และก็จะมีกระดาษเปล่าให้ด้วย 1 ใบ เราต้องการให้ทุกท่านวางการ์ดลงบนกระดาษเปล่านี้ โดยที่ให้ท่านวางการ์ดที่ท่านคิดว่ามีความใกล้เคียงกันในความเห็นของท่านไว้ใกล้ๆกัน อันไหนที่ท่านคิดว่าต่างกัน ให้วางห่างออกไป ท่านสามารถใช้เกณฑ์ใดก็ได้ในการตัดสินใจ แล้วแต่ท่านเลย และไม่มีถูกไม่มีผิด

“เมื่อท่านวางการ์ดเสร็จเรียบร้อยแล้ว เราอยากให้ท่านเขียนคอมเม้นท์ใกล้ๆกลุ่มของการ์ดที่เหมือนกัน ด้วยคำสำคัญสองสามคำเพื่ออธิบายสิ่งที่ท่านรู้สึกเกี่ยวกับการ์ดเหล่านั้น เมื่อทำเสร็จแล้ว ช่วยติดกาวเพื่อให้การ์ดอยู่กับที่บนกระดาษ และบอกให้เราทราบว่าท่านทำเสร็จแล้ว

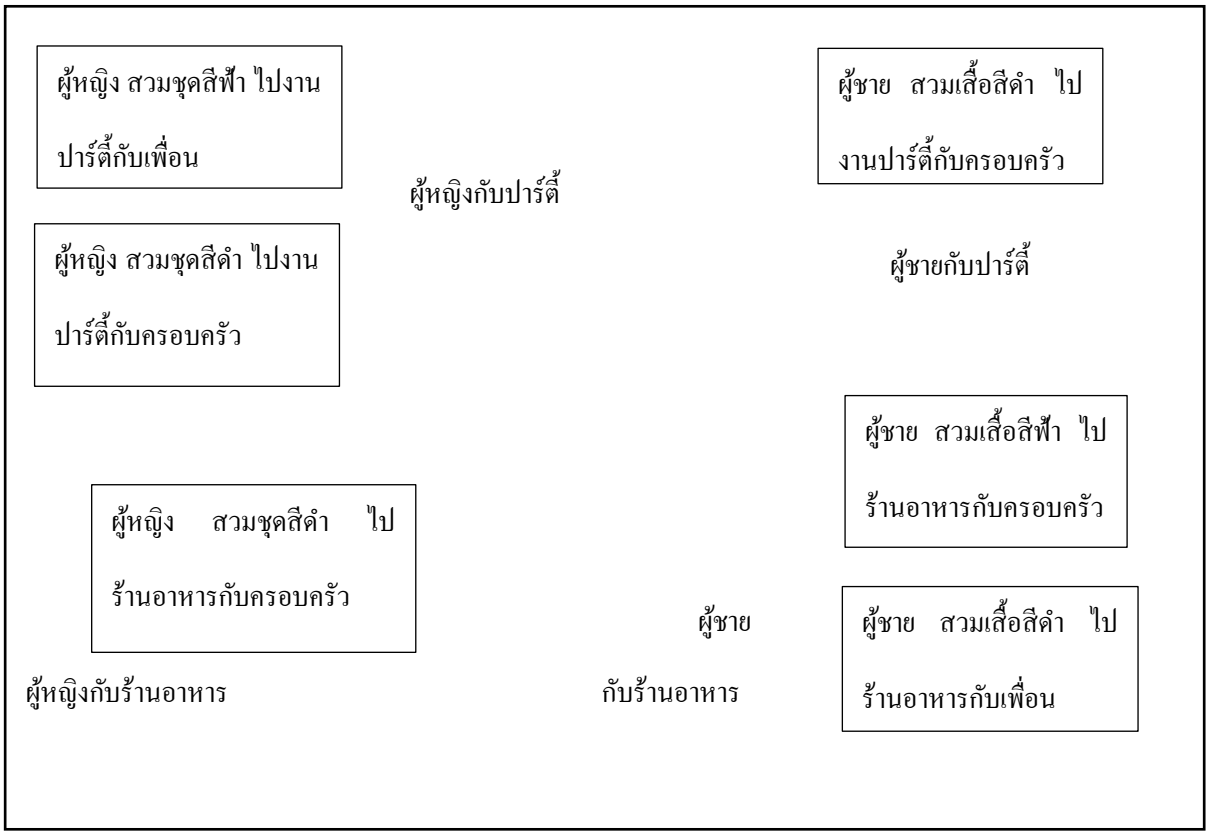
คำถามหลัก: ทำไมท่านถึงวางการ์ดตามตำแหน่งนี้ที่ท่านวางไว้ อธิบายคำที่ท่านใช้อธิบาย (เช่น รู้สึกอย่างในไรต่อสถานการณ์ต่างๆในการกิน หรือความแตกต่าง)

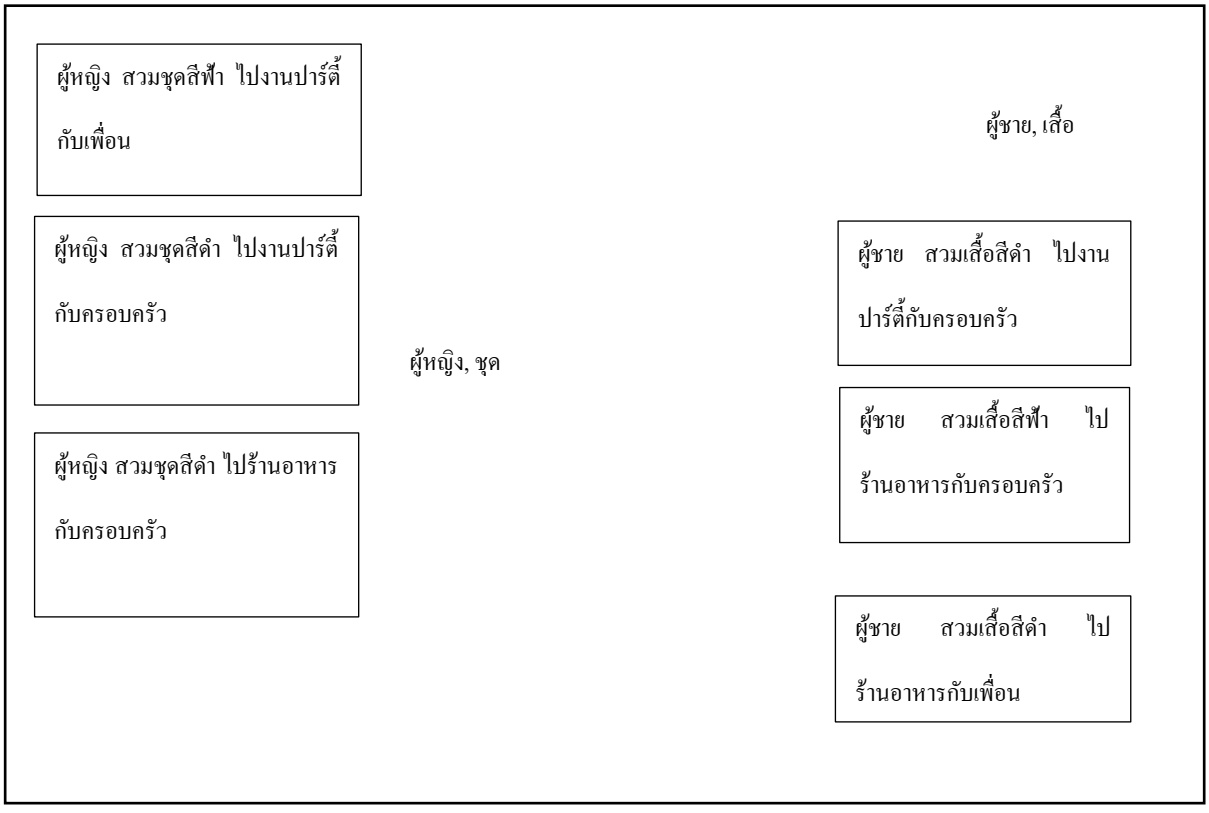
ตัวอย่าง: สมมติว่าท่านต้องเรียบเรียงสำหรับการ์ด 6 การ์ดนี้ และอธิบาย:

ผู้หญิง สวมชุดสีฟ้า ไปงานปาร์ตี้กับเพื่อน	ผู้หญิง สวมชุดสีดำ ไปร้านอาหารกับครอบครัว	ผู้ชาย สวมเสื้อสีดำ ไปงานปาร์ตี้กับครอบครัว
ผู้ชาย สวมเสื้อสีฟ้า ไปร้านอาหารกับครอบครัว	ผู้ชาย สวมเสื้อสีดำ ไปร้านอาหารกับเพื่อน	ผู้หญิง สวมชุดสีดำ ไปงานปาร์ตี้กับครอบครัว

- แสดงตัวอย่าง

ตัวอย่างข้างล่างนี้ เป็นตัวอย่างการจับกลุ่ม และคอมแม้นท์ พยายามใช้จินตนการ และความคิดสร้างสรรค์ สามารถคอมแม้นได้ทั้งแง่ลบ แง่บวก และใช้คุณศัพท์ในการอธิบาย





การ์ด 8 การ์ดจะมาจากการสุ่มตัวอย่างสถานการณ์สมมติ 32 สถานการณ์ทั้งหมดที่สร้างจากเค้าโครงดังกล่าวข่างล่าง

ท่านเพิ่งรับประทานอาหารเย็นเสร็จ [คนเดียว/กับผู้อื่น] [ที่บ้าน/ที่ร้านอาหารนอกบ้าน] อาหารมีมูลค่าประมาณ [100 บาท/ 500 บาท] ต่อคน ท่านอิ่มแล้วแต่ยังมีอาหารเหลืออยู่บนโต๊ะ ซึ่งเพียงพอสำหรับเป็นมื้อกลางวันวันพรุ่งนี้ได้ [ทั้งมื้อ/ ครึ่งมื้อ] lunch tomorrow. ท่าน [มี/ ยังไม่มี] แผนการสำหรับอาหารมื้อกลางวันและมื้อเย็นวันพรุ่งนี้

ให้เวลาประมาณ 15-20 นาทีในการทำแมปปิ้ง เมื่อเวลาผ่านไป15 นาทีให้เริ่มตรวจสอบผู้เข้าร่วมสนทนา ถ้ายังไม่เสร็จให้ใช้เวลาเพิ่มได้อีก 5 นาที หลังจากนั้นให้เร่งให้เสร็จแล้วติดเทปกาวกับกระดาษเปล่า แล้วบอกให้นั่งรวมกันเป็นกลุ่ม

ขั้นตอนที่ 5) สนทนากลุ่มเกี่ยวกับ Project Mapping (25 นาที): 1.15 hrs

เมื่อทุกท่านกลับเข้านั่งที่ในกลุ่ม “ดิฉันเห็นว่าแต่ละคนก็สร้างแผนภูมิแตกต่างกันออกไป เป็นสิ่งที่น่าสนใจมากๆ ต้องการให้ทุกท่านเล่าว่าทำไมถึงได้วางการ์ดแบบนี้ ท่านคิดเห็นอย่างไร”

- ผู้ดำเนินการสนทนา สอบถามความคิดเห็นแต่ละคนเดี่ยวกับแผนภูมิของตัวเองเริ่มจากสมาชิกด้านขวา เปิดโอกาสให้อธิบายเหตุผล แล้ววนไปรอบโต๊ะ ผลัดกันอธิบาย

“ทำไมท่านถึงเขียนคำเหล่านี้ แล้วทำไมถึงจัดกลุ่มแบบนี้”

- เก็บรวบรวมแผนภูมิ และเอกสารที่เกี่ยวข้องเมื่อการอภิปรายในส่วนนี้จบลง

ขั้นตอนที่ 6) พฤติกรรมผู้บริโภคทางด้านอาหารเหลือทิ้ง - เฉพาะเจาะจงทางปัจัยทั้ง 5 ที่ศึกษา การปรากฏของบุคคลอื่น สถานที่ ราคา ปริมาณ และแผนการในอนาคตด้านอาหาร (25minutes): 1.40 hrs

จุดประสงค์ของขั้นตอนนี้ คือเพื่อเจาะลึกถึงเหตุผลของการตัดสินใจทิ้งอาหารจากปัจจัยด้านต้น การปรากฏของบุคคลอื่น สถานที่ ราคา ปริมาณ และแผนการในอนาคตด้านอาหาร

คำถามหลัก คือต้องการทราบว่าปัจจัยใดเป็นปัจจัยหลักในการตัดสินใจว่าจะเก็บ หรือ ทิ้งเศษอาหารที่เหลือ

"อยากให้ทุกท่านใช้เวลาจินตนาการซักแปปนึงว่าท่านกำลังรับประทานอาหาร เป็นบางโอกาสที่ท่านรับประทานอาหารจนหมดเกลี้ยง และไม่ต้องคำนึงถึงอาหารเหลือทิ้ง แต่ว่าในบางครั้งก็อาจจะมีโอกาสที่ท่านอาจจะมีอาหารเหลืออยู่บ้าง และต้องตัดสินใจว่าจะทำอย่างไรกับอาหารที่เหลือนี้"

1"แล้วถ้าเป็นด้านราคาอาหารละ มีความสำคัญต่อการตัดสินใจหรือไม่"

2"เรามาพูดถึง...ถ้าเวลาเรากินแล้วมีคนอื่นอยู่ด้วย/ สถานที่ที่กิน/ ปริมาณอาหารที่เหลือ/ แผนการกินในมื้อถัดไป..."

..เหตุใดการที่มีคนอื่นอยู่ด้วยจึงสำคัญต่อการตัดสินใจว่าจะเก็บอาหารหรือจะทิ้งอาหารที่เหลือ และท่านรู้สึกอย่างไรถ้าต้องทิ้งอาหารเมื่อมีคนอื่นอยู่ด้วย

3.. เหตุใดสถานที่กินอาหารจึงมีความสำคัญต่อการตัดสินใจว่าจะเก็บอาหารหรือจะทิ้งอาหารที่เหลือ และท่านรู้สึกอย่างไรถ้าต้องทิ้งอาหารเมื่อกินอาหารนอกบ้าน หรือ ในบ้าน

4...เหตุใดปริมาณอาหารที่เหลือจึงสำคัญต่อการตัดสินใจว่าจะเก็บอาหารหรือจะทิ้งอาหารที่เหลือ และท่านรู้สึกอย่างไรถ้าต้องทิ้งอาหารที่มีปริมาณ น้อย หรือ มาก

5...เหตุใดแผนการกินในมื้อถัดไปจึงสำคัญต่อการตัดสินใจว่าจะเก็บอาหารหรือจะทิ้งอาหารที่เหลือ และท่านรู้สึกอย่างไรถ้าต้องทิ้งอาหารเมื่อมี หรือ ไม่มีแผนการ

มีปัจจัยใดนอกเหนือจากนี้สำหรับท่านเมื่อต้องตัดสินใจว่าจะต้องเก็บอาหารที่เหลือ หรือ ทิ้งอาหารที่เหลือ

คำถามอื่นๆที่สามารถถามได้เพิ่มเติม:

การทิ้งอาหารเหลือที่บ้าน และที่ร้านอาหารแตกต่างกันหรือไม่

การทิ้งอาหารเหลือเมื่อกินอาหารคนเดียว กับการกินอาหารกับคนอื่นแตกต่างกันหรือไม่

การทิ้งอาหารเหลือที่มีราคาไม่แพง กับราคาแพง แตกต่างกันหรือไม่

การทิ้งอาหารเหลือที่มีปริมาณต่างกัน แตกต่างกันหรือไม่

การทิ้งอาหารเหลือเมื่อท่านมี หรือยังไม่มีแผนการสำหรับมื้อถัดไป แตกต่างกันหรือไม่

ขั้นตอนที่ 7) สถานการณ์ในอุดมคติ(15 นาที): 1.55 hrs

มีสถานการณ์ไหนเป็นพิเศษหรือไม่ที่ท่านตัดสินใจที่จะเก็บอาหารไว้หลังมื้ออาหาร โดยเฉพาะอย่างยิ่งให้ท่านยกตัวอย่าง อธิบายเกี่ยวกับ, เมื่อรับประทานคนเดียว หรือ มีผู้อื่นอยู่ด้วย, สถานที่, ประเภทอาหาร, เวลา, ราคา, ปริมาณอาหารที่เหลือ, แผนการในอนาคต

- มีสถานการณ์ไหนเป็นพิเศษหรือไม่ที่ท่านตัดสินใจที่จะเก็บอาหารไว้หลังมื้ออาหาร โดยเฉพาะอย่างยิ่งให้ท่านยกตัวอย่าง อธิบายเกี่ยวกับ, เมื่อรับประทานคนเดียว หรือ มีผู้อื่นอยู่ด้วย, สถานที่, ประเภทอาหาร, เวลา, ราคา, ปริมาณอาหารที่เหลือ, แผนการในอนาคต

ขั้นตอนที่ 8) ปิดการสนทนา (5 นาที): 2.00 hrs

จุดประสงค์เพื่อเปิดโอกาสให้ได้เพิ่มเติมข้อคิดเห็น โดยเฉพาะผู้ที่ค่อนข้างเงียบ

“ก่อนที่เราจะปิดการสนทนา อยากเปิดโอกาสให้ท่านได้เพิ่มเติมข้อคิดเห็น อะไรที่ยังไม่ได้กล่าวถึง”

- ปล่อยให้ได้มีโอกาสพูดอย่างเสมอกัน
- ขอบคุณ
- ให้ของสมนาคุณ และให้ใบเสร็จเซ็นชื่อ
- แจกรายละเอียดงานวิจัย

รับสมัครอาสาสมัครเข้าร่วมการสนทนากลุ่ม

หัวข้อ "พฤติกรรมผู้บริโภค กับ ขยะประเภทอาหารเหลือทิ้ง"

ผู้เข้าร่วมจะต้อง....

- ☑ อายุ18-75 ปี
- ☑ ผู้ชาย/ผู้หญิง ก็ได้
- ☑ พำนักอยู่ในประเทศไทย
- ☑ มีสัญชาติไทย

- ✓ เข้าร่วมการสนทนากลุ่ม 1 ครั้ง ประมาณ 1.5-2 ชม.
- ✓ ไลน์ หรือ อีเมลล์เพื่อนัดสถานที่ และเวลาที่ทุกคนในกลุ่มอาสาสะดวกมาได้พร้อมกัน (ภายในม.เกษตร)
- ✓ จะนัดอยู่ในช่วง 10-20 ก.ค. 2562

สอบถามเพิ่มเติม หรือ ลงชื่อเข้าร่วมได้ที่ นางสาวพรจันทร์ พิณพาทย์ (แพรว):
ไลน์: prauponjan อีเมลล์ ponjan.pinpart@pgr.reading.ac.uk

Appendix 13 - Focus Group Discussion – Example of Transcription and Projective Map (UK)

Moderator: What comes to your mind first when talking about food waste?

Participant 8: Does this include packaging and things associate to food?

Moderator: So, you mean you think about packaging as well when you hear about the word food waste?

Participant 8: Yes, the whole food processes.

Moderator: Anyone else?

Participant 18: Guess I have an image of things in the fridge like a kind of domestic setting, and things in the fridge going off and people just put it in the bin because they can't consume it.

Participant 4: That's the first thing that came to my mind also in my fridge hmm at home and try not to waste is. And also sort of thinking about supermarket, when I think about food waste.

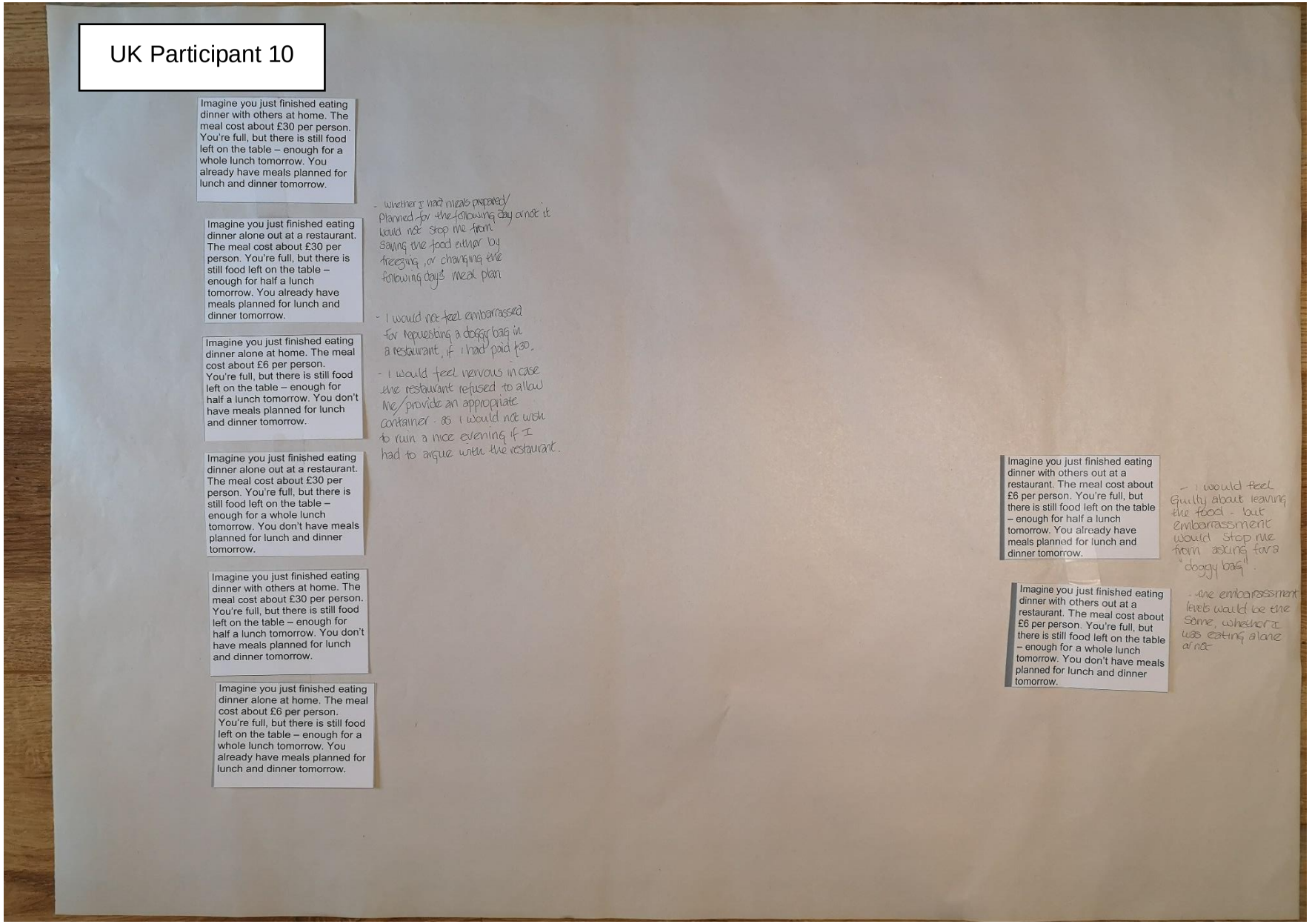
Participant 11: I sort of think of it as both things but also at farms and that's where you get wonky food that a little bit less perfect, it's just left raw or chuck away.

Participant 32: Or in restaurants where people weren't finished the amount of food they eat or they just cook too much.

Participant 7: The first image that came into my head was of a plate held over a waste paper bin, a rubbish bin, and someone is scraping the food of it into the bin. Although that's not necessarily one impression of food waste but it's the first image that came to my head.

Participant 32: I do tend to think of solid food but I think it could also include things like milk and tea. So that's not just solids but liquid too.

Participant 30: Yeah. And the very minute things as well things like for some reasons people tend to chop the end of leaks but there's no real reason for that in my mind anyway. That bits of leaks are still useful. And I like chopping off the top of broccoli as well. I don't see any reasons why you can't eat the stalk. Things like that, the bits of leaks, the bits of individual, bits of food see as waste, or not desirable to eat.


UK Participant 10
Imagine you just finished eating dinner with others at home. The meal cost about £30 per person. You're full, but there is still food left on the table – enough for a whole lunch tomorrow. You already have meals planned for lunch and dinner tomorrow.
Imagine you just finished eating dinner alone out at a restaurant. The meal cost about £30 per person. You're full, but there is still food left on the table – enough for half a lunch tomorrow. You already have meals planned for lunch and dinner tomorrow.
Imagine you just finished eating dinner alone at home. The meal cost about £6 per person. You're full, but there is still food left on the table – enough for half a lunch tomorrow. You don't have meals planned for lunch and dinner tomorrow.
Imagine you just finished eating dinner alone out at a restaurant. The meal cost about £30 per person. You're full, but there is still food left on the table – enough for a whole lunch tomorrow. You don't have meals planned for lunch and dinner tomorrow.
Imagine you just finished eating dinner with others at home. The meal cost about £30 per person. You're full, but there is still food left on the table – enough for half a lunch tomorrow. You don't have meals planned for lunch and dinner tomorrow.
Imagine you just finished eating dinner alone at home. The meal cost about £6 per person. You're full, but there is still food left on the table – enough for a whole lunch tomorrow. You already have meals planned for lunch and dinner tomorrow.
- whether I had meals prepared/ planned for the following day or not it would not stop me from saving the food either by freezing, or changing the following days meal plan
- I would not feel embarrassed for requesting a doggy bag in a restaurant, if I had paid £30.
- I would feel nervous in case the restaurant refused to allow me/provide an appropriate container - as I would not wish to ruin a nice evening if I had to argue with the restaurant.
Imagine you just finished eating dinner with others out at a restaurant. The meal cost about £6 per person. You're full, but there is still food left on the table – enough for half a lunch tomorrow. You already have meals planned for lunch and dinner tomorrow.
Imagine you just finished eating dinner with others out at a restaurant. The meal cost about £6 per person. You're full, but there is still food left on the table – enough for a whole lunch tomorrow. You don't have meals planned for lunch and dinner tomorrow.
- I would feel Guilty about leaving the food - but embarrassment would stop me from asking for a "doggy bag".
- the embarrassment levels would be the same, whether I was eating alone or not

Appendix 14 - Focus Group Discussion – Example of Transcription and Projective Map (Thailand)

Moderator: What comes to your mind first when talking about food waste?

Participant 26: My kids' leftovers. Leftover breakfast in a box.

Moderator: Mostly breakfast isn't it? Why you firstly think about breakfast?

Participant 26: Yes, because we don't have enough time. I normally cook in the morning and prepare the food for my kids to come to school. The first meal I see leftovers would be this breakfast time. Yes breakfast.

Participant 21: Because it has time limitation.

Participant 26: Yes, limited by time because we drive to school. Sometimes my kids fall asleep in the car, sometimes unintentionally hold the food in his mouth for too long. And there is rice left, for example. We bin it when we arrive at the school. Mostly this is when we have food waste, just from breakfast.

Moderator: Anyone has any more additional comments or opinions?

Participant 25: I think about compost. I want to do whatever to the food waste at home so that it can be used afterwards but I can't. I can only think, and I want to be able to do it.

Participant 22: For food waste, I have 2 ways of thinking. Like it pops in my head. In my family, everyone has their own ways in the morning. So, it will be dinner that we eat together. Therefore, the food waste would be from cooking like the bottom part of vegetables, stalks, roots, what we cut and remove like meat scrap, fat, and plate waste like the fat part of the meat.

Participant 23: For me, what I think about first is "food waste is a wet rubbish". I'm the one who do separate types of rubbish and when it comes to food waste, oh this is wet rubbish.

Moderator: What about opinions from younger people?

Participant 15: I think about plate waste, something like that.

Thailand

Participant 12