

British and Thai consumer plate waste behaviour: a qualitative comparison

Article

Published Version

Creative Commons: Attribution-Noncommercial-No Derivative Works 4.0

Open Access

Walter, P. and Asioli, D. ORCID: <https://orcid.org/0000-0003-2274-8450> (2023) British and Thai consumer plate waste behaviour: a qualitative comparison. *Food and Applied Bioscience Journal*, 11 (1). ISSN 2286-8615 Available at <https://centaur.reading.ac.uk/112101/>

It is advisable to refer to the publisher's version if you intend to cite from the work. See [Guidance on citing](#).

Published version at: <https://li01.tci-thaijo.org/index.php/fabjournal/article/view/257312>

Publisher: Faculty of Agro-Industry, Chiang Mai University

All outputs in CentAUR are protected by Intellectual Property Rights law, including copyright law. Copyright and IPR is retained by the creators or other copyright holders. Terms and conditions for use of this material are defined in the [End User Agreement](#).

www.reading.ac.uk/centaur

CentAUR

Central Archive at the University of Reading

Food and Applied Bioscience Journal



ISSN : 2286-8615
VOLUME 11 ISSUE 1
(JANUARY - APRIL 2023)

Food and Applied Bioscience Journal

TABLE OF CONTENTS

PAGE

- The effect of kappa carrageenan on physical and textural properties as well as sensory parameters on plant protein mixture-based nuggets** 1 - 12

Warissara Jindasuay, Yamonpat Klamchuen
and Phatthira Sakamut

- British and Thai consumer plate waste behaviour: a qualitative comparison** 13 - 26

Ponjan Walter and Daniele Asioli

ISSN : 2286-8615
VOLUME 11 ISSUE 1
(JANUARY - APRIL 2023)

British and Thai consumer plate waste behaviour: a qualitative comparison

Ponjan Walter^{1,*} and Daniele Asioli²

¹*Division of Product Development Technology, Faculty of Agro-Industry, Chiang Mai University, Chiang Mai, 50100, Thailand*

²*Department of Applied Economics and Marketing, University of Reading, Reading, RG6 6EU, United Kingdom*

*Corresponding author. E-mail: ponjan.p@cmu.ac.th

Submit: 27 December 2022, Received: 3 January 2023, Revised: 23 January 2023, Accepted: 24 January 2023, Publish online: 25 April 2023

Abstract

One-third of food produced for human consumption ends up being lost in the food supply chain. The waste of food also means wasted resources. While there are active policies to minimise food waste (FW) at the consumption level in western countries, the problem has not been highlighted in some other countries. This research aims to gain an in-depth understanding of British and Thai consumers' comprehensive experience, expectations, and opinions about consumer plate waste (CPW) in dining situations. The method used for data collection is the focus group discussion method (FGD) assisted by the projective mapping method (PM). The quota sampling was used for equal gender and age groups. A total of four discussion groups were arranged with participants who were between 18-75 years old from various occupation backgrounds. Two were in the United Kingdom for British consumers (n=17) and the other two in Thailand for Thai consumers (n=16). The method of analysing the FGD data in this study uses the qualitative content analysis approach. The results suggest that CPW behaviour was influenced by multiple factors with complicated interactions between factors in a meal setting. In the context of meal food and FW, most British people were more concerned about behaviour in the stages of buying, planning, and cooking food before it became a meal, whereas nearly 100% of Thai participants would depend on the intrinsic quality of the food, such as taste. Place of dining had a significant impact on consumers' FW decisions. While around 10 out of 17 UK participants would not want to take leftover food home when eating out because of social stigma, Thai participants would not mind doing so. The findings of this research shed light on consumer FW behaviour in a meal setting. Policymakers could utilise these findings to make decisions about consumer FW reduction campaigns for national food security and sustainability, particularly when adopting

practices from another country. This is because of certain significant factors, what consumers are concerned about varies between countries and globalisation changes consumption patterns over time.

Keywords: Food waste, Food security, Food policy, Consumer research, Focus group discussion

1. Introduction

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).

FW adds further challenges for our society to overcome, such as poverty, climate change (e.g. greenhouse gas 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). 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.*, 2014). The topic of FW has gained more interest in developed countries (Parfitt *et al.*, 2010; Hodges *et al.*, 2011). However, there is a large number of population in developing countries. Therefore, the magnitude of the problem in these nations should not be overlooked.

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). 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, J. *et al.*, 2018; Ellison and Lusk, 2018). For example, Ellison and Lusk (2018) pointed out that consumers could make different FW decisions about meals at home versus out-of-home. 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 restaurants. 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). 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, J. *et al.*, 2018; Aschemann-Witzel, Jessica *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). CFW behaviour in a restaurant setting has been understudied, particularly in developing countries.

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. However, Britz *et al.* (2014) emphasised that differences between regions should be taken into account in order to design a policy. 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 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). This study, therefore, aims to uncover factors affecting people when making FW decisions and to compare British and Thai consumers.

2. Materials and Methods

The qualitative research method was implemented using focus group discussion (FGD) as an approach to obtain in-depth information about CFW behaviour. 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 FGDs were conducted in May 2019 for the UK and another two groups in July 2019 for Thailand.

2.1 Participants

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 1, 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.

Table 1 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
	47-75 years old	M2	0	1	2
Female	18-46 years old	F1	3	2	5
	47-75 years old	F2	2	3	2

2.2 Recruitment

Participants were recruited using posters and advertising through social media and e-mails. People who were interested in joining the discussion contacted the researchers via e-mails. Each participant received a 15% discount voucher in return from a restaurant at the end of the discussion.

2.3 Focus group discussion procedure

Each discussion followed the eight sections: registration, introduction and warm-up, consumer food waste - general, projective mapping, projective mapping discussion, consumer food waste - specific, ideal situations and closing.

After the introduction, the ice-breaking question was: *"when you hear the words 'food waste', what comes first to your mind?* The step of "Consumer food waste – the general perception" aimed to examine consumers' in-depth experience without limiting them to any specific factors. After that, participants were asked to individually join an activity called a projective mapping to project their opinion. The projective mapping (PM) was a task for each participant to do. 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). There were eight hypothetical dining scenarios (Fig 1 and Table 2) (Almli *et al.*, 2015) given to each participant for them to create a perceptual map (Risvik *et al.*, 1994). The participants were asked to 1) group meal situations together for which they think there are similar attributes or qualities and 2) place the figures on 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). We also asked participants to describe samples with some keywords (Dehlholm, 2014). Examples of cards with wording adapted from Ellison and Lusk (2018) are shown in Fig 1.



Fig 1 Examples of PM cards in English and Thai

There are five factors in the vignette written on each card which are meal cost, place of dining, amount of leftovers, future meal plan and presence of others. The first four were adapted from Ellison and Lusk (2018) based on Becker (1965) household production model. Meal costs are based on 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 £30/500 Baht) 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).

However, previous empirical findings suggested that this normative expectation has an influence of CFW behaviour (Qi and Roe, 2016; Stancu *et al.*, 2016; Delley and Brunner, 2017; Lorenz *et al.*, 2017; Aschemann-Witzel, Jessica *et al.*, 2019). The presence of others was developed and added to the vignette. Every participant received the same eight cards. Those eight scenario details can be found in Table 2.

Table 2 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

2.6 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). The analysis processes include data assembly, reduction of the data, display, and verification, respectively. QSR International's NVivo 12 software was used to assist in data analysis. Initially, the discussions were transcribed in the original language. After that, for the Thailand data, all materials in Thai were translated into English for further steps of analysis by the researcher.

3. Results and Discussion

3.1 General perception about FW

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 different feedback is about the types of food and where FW takes place. The most discussed theme for Thailand was about plate waste. Among the UK groups, FW at the retail level was the most popular topic. Moreover, participants were likely to mention reasons based on food attributes. Opinions from Thai groups focused on intrinsic quality but ideas from the UK participants tended to be more about extrinsic aspects.

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.

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.

3.2 FW in a meal setting

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. It was found that meal portion size is important and varies depending on whether people serve themselves or not. CFW decisions also depend on what type of food is served. Particularly revealing is how the participants described their preferences in terms of food taste and specific food they do not consume. Gender and health setting. Many Thai participants mentioned "*women and diet control or weight loss*" and "*women and diabetes*".

"Value" was also considered important. Participants reported that they did not want to waste food because it costs them something despite the food being cheap or expensive. They did not want to easily throw it away if they had spent time preparing a meal. 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. 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.

3.3 Projective mappings

From the PM task, Thai and British people had some similarities and differences in their thought processes and PM 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.

Most participants considered two factors at the same time. 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 presence of others in meal situations together with the place in making a FW decision.

From the PM task, there are strong links between dining scenarios number 3, 2, 6 and 1 from the pooled data and the data from each country. This reflects that consumers used eating at home as their main consideration when grouping dining situations. While there were many times that consumers grouped these four scenarios particularly among the UK groups, Thai participants were likely to split scenarios 3 and 2 from 6 and 1 which means "Plan" was considered together with "Place". Additionally, scenario 7 was most likely perceived as the same as scenario 8 (eating cheaper food with other people in a restaurant). Scenario 5 was usually put next to 4 (eating more expensive food alone in a restaurant).

Keywords that explain each group of scenarios 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*". On the other hand, British participants emphasised how "*convenient*" it is to save 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 (eating at home with future meal plan) could be adjusted or rescheduled. In this group of dining situations, cost and the presence of others also seem to play less of a role in mapping than the dining place, unlike the group of scenarios 5, 4, 7 and 8 (eating at a restaurant).

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 or fear to be perceived as being "*cheap*".

3.4 Presence of others

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. For British people, it was about ownership of the food. For Thai consumers, there was a stronger theme of social hierarchy.

British participants agreed that, when eating alone, they would be able to make decision to order or cook food the right amount of food. 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. Firstly, 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. Secondly, 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.

However, a couple of other British consumers responded differently. They said, "*I don't care*", "*I wouldn't mind*". 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.

Participants in Thailand also focused more on the eating out context when discussing the influences of other people in a meal setting and less experience about eating alone. A recurrent theme in the group discussion was food may be wasted less when dining with people with whom they are familiar. 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. Furthermore, some participants claimed they would be more confident to save the food if others in the table started to do so. Almost everyone in both groups in Thailand agreed that it also depends on who pays the bill.

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.

3.5 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.

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, 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. On the other hand, 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.

3.6 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.

3.7 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"*). However, 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. Moreover, for both British and Thai people, if the food is in forms such as in pieces which are easily packed, they would consider saving the food.

3.8 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. However, 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).

3.9 Discussion

This present study showed in-depth information from participants about CFW in a meal setting. 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.

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. These results are in line with Quested *et al.* (2011) and Graham-Rowe *et al.* (2014). On the other hand, Thai people would be concerned more about the FW due to attributes of food 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 (Lewis, 2017; Mills *et al.*, 2018). In Thailand, there is high availability dining places away from home, and average Thai people usually eat out 56 times/month (Sirikeratikul, 2018; Krommuang *et al.*, 2017).

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. Moreover, participants also valued the time and effort someone has spent on cooking it. Our findings also show that 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).

The place of dining plays the most important role in CFW decisions in saving leftover food, followed by food cost. Meal planning did not seem to have any influence on saving leftover food. These results comply with Mirosa *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 presence of others and the amount of leftovers due to social expectation. This result is corroborated by Mirosa *et al.* (2018) particularly when dining in a restaurant which is quite different from Thai consumers. This opinion from Thai participants is in line with "American culture" (Gambardello, 2013; Sirieix *et al.*, 2017).

An in-depth explanation about why future meal planning has a low impact on CFW could be its flexibility. This is in contrast with the findings from Farr-Wharton *et al.* (2014). 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.

4. Conclusion

The primary purpose of this study is to uncover CFW experience and in-depth opinions about FW drivers. 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).

Acknowledgement

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, Payuda Harnsoongnern, Atikrit Chanjavanakul for facilitating the focus group discussion sessions.

References

Aamir, M., Ahmad, H., Javaid, Q. and 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(5): 591-610.

Abeliotis, K., Lasaridi, K. and Chroni, C. 2016. Food waste prevention in athens, greece: the effect of family characteristics. *Waste Management & Research*. 34(12): 1210-1216.

Ahamed, A., K. Yin, B. J. H. Ng, F. Ren, V. W. C. Chang and J. Y. Wang. 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.

Almli, V. L., G. MacDonald, H. Rohm, J. Aschemann-Witzel, B. Steenbekkers, D. Roodhuyzen, A. Normann and M. Oostindjer. 2015. Qualitative usage of projective mapping in focus groups. An application on food waste in five countries. 11th Pangborn Sensory Science Symposium, Gothenburg, Sweden.

Aschemann-Witzel, J., de Hooge, I. E., Lengard Almli, V. and Oostindjer, M. 2018. Fine-tuning the fight against food waste. *Journal of Macromarketing* 38(2): 168-184.

Aschemann-Witzel, J., Giménez A., Grønhøj, A. and 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*. 54(2): 581-606.
<https://doi.org/10.1111/joca.12291>.

Becker, G. S. 1965. A theory of the allocation of time. *The Economic Journal*. 75(299): 493-517.

Bender, A. 2012. The World's Top 10 Cities for Street Food. Accessed 15 March 2018. <https://www.forbes.com/sites/andrewbender/2012/09/19/the-worlds-top-10-cities-for-street-food/#1f8e25833897>.

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. and 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(2): 292-304.

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

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).

Buzby, J. C., Wells, H. F. and Hyman, J. 2014. The estimated amount, value, and calories of postharvest food losses at the retail and consumer levels in the United States. *SSRN Electronic Journal*. DOI:10.2139/ssrn.2501659

Connell, P. M., Finkelstein, S. R., Scott, M. L. and 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.

Dehlholm C. 2014. Project mapping and napping. In *Novel Techniques in Sensory Characterization and Consumer Profiling*, edited by Paula Varela and Gastón Ares. Florida: CRC Press.

Delley, M. and Brunner, T. A. 2017. Food waste within swiss households: a segmentation of the population and suggestions for preventive Measures. *Resources Conservation and Recycling* 122: 172-184.

Diaz-Ruiz, R., Costa-Font, M. and 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.

Ellison, B. and Lusk, J. L. 2018. Examining household food waste decisions: a Vignette approach. *Applied Economic Perspectives and Policy*. 40(4): 613-631.

FAO. 2011. Global food losses and food waste: extent, causes and prevention. Rome: FAO.

Farr-Wharton, G., Foth, M. and Jaz H Choi, J. H. 2014. Identifying factors that promote consumer behaviours causing expired domestic food waste. *Journal of Consumer Behaviour*. 13(6): 393-402.

Filimonau, V., Fidan, H., Alexieva, I., Dragoev, S. and 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: pp.100577.

Gambardello, J. A. 2013. Uncertain origins of american doggy bag. McClatchy - Tribune Business News U6 2013. Accessed 14 March 2013. https://www.inquirer.com/philly/food/20130314_Uncertainorigins_of_American_doggy_bag.html.

Graham-Rowe, E., Jessop, D. C. and Sparks P. 2014. Identifying motivations and barriers to minimising household food waste. *Resources Conservation and Recycling*. 84: 15-23.

Hodges, R. J., Buzby J. C. and Bennett, B. 2011. Postharvest losses and waste in developed and less developed countries: opportunities to improve resource use. *Journal of Agriculture Science*. 149(S1): 37-45.

Hopfer, H., and Hildegarde H. 2013. A summary of projective mapping observations - the effect of replicates and shape and individual performance measurements. *Food Quality and Preference*. 28(1): 164-181.

Joerissen, J., Priefer, C. and 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(3): 2695-2715.

Katajajuuri, J. -M., Silvennoinen, K., Hartikainen, H., Heikkilä, L. and Reinikainen, A. 2014. Food waste in the Finnish food chain. *Journal of Cleaner Production*. 73: 322-329.

Khongtong, J., Ab Karim, S., Othman, M. and Bolong, J. 2014. Consumption pattern and consumers' opinion toward street food in Nakhon Si Thammarat Province, Thailand. *International Food Research Journal*. 21(1): 125.

Krommuang, A., Suwunnamek, O. and Hothonhcum, K. 2017. Does the marketing mix affect street food consumption in Thailand?. *International Journal of Business, Marketing and Decision Sciences (IJBMDS)*. 10(1): 76.

Lewis, S. 2017. Restaurants 2017: Food for thought. PwC United Kingdom. Accessed 3 December 2019. <https://www.pwc.co.uk/services/business-restructuring/insights/restructuring-trends/restaurants-2017-food-for-thought.html>.

Longo-Silva, G., Toloni, M., Rodrigues, S., Rocha, A. and Taddei, J. A. de. 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(2): 135-144.

Lorenz, B. A., Hartmann, M., Hirsch S., Kanz O. and Langen, N. 2017. Determinants of plate leftovers in one german catering company. *Sustainability*. 9(5): pp.807.

Malhotra, N. K., Nunan, D. and Birks, D. F. 2017. Marketing research: an applied approach. New York: Pearson.

Mallinson, L. J., Russell, J. M. and Barker, M. E. 2016. Attitudes and behaviour towards convenience food and food waste in The United Kingdom. *Appetite*. 103(1): 17-28.

Mills, S., Adams, J., Wrieden, W., White, M. and 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(12): 2255-2266.

Mirosa, M., Liu Y. and Mirosa, R. 2018. Consumers' behaviors and attitudes toward doggy bags: identifying barriers and benefits to promoting behavior change. *Journal of Food Products Marketing*. 24(5): 563-590.

Office for National Statistics. 2018. Detailed household expenditure by equivalised disposable income decile group: Table 3.1E. Accessed 29 May 2018. <https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/datasets/detailedhouseholdexpenditurebyequivaliseddisposableincomedecilegroupoecdmodifiedscaleuktable31e>.

Parfitt, J., Barthel, M. and Sarah 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(1554): 3065-3081.

Pinstrup-Andersen, P. and Watson II, D. D. 2011. Food policy for developing countries. *The Role of Government in Global, National and Local Food Systems*. Ithaca. NY: Cornell University Press.

Pirani, S. I. and Arafat, H. A. 2016. Reduction of food waste generation in the hospitality industry. *Journal of Cleaner Production*. 132: 129-145.

Principato, L., Secondi, L. and Pratesi, C. A. 2015. Reducing food waste: an investigation on the behaviour of italian youths. *British Food Journal*. 117(2): 731-748.

Qi, D. Y. and B. E. Roe. 2016. Household food waste: multivariate regression and principal components analyses of awareness and attitudes among US Consumers. *PLOS ONE*. 11(7): pp.e0159250.

Quested, T., Parry, A., Easteal, S. and R. Swannell, R. 2011. Food and drink waste from households in the UK. *Nutrition Bulletin*. 36(4): 460-467.

Reutter, B., Lant, P., Reynolds, C. and Lane, J. 2017. Food waste consequences: environmentally extended input-output as a framework for analysis. *Journal of Cleaner Production*. 153: 506-514.

Richter, B. and Bokelmann W. 2017. Explorative study about the analysis of storing, purchasing and wasting food by using household diaries. *Resources Conservation and Recycling*. 125(C): 181-187.

Risvik, E., McEwan, J. A., Colwill, J. S., Rogers, R. and Lyon, D. H. 1994. Projective mapping: a tool for sensory analysis and consumer research. *Food Quality and Preference*. 5(4): 263-269.

Robinson, E. and 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(6): 750-752.

Roodhuyzen, D. M. A., Luning, P. A., Fogliano, V. and 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.

Rutten, M. 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(1): 13. <https://doi.org/10.1186/2048-7010-2-13>.

Secondi, L., Principato, L. and Laureti, T. 2015. Household food waste behaviour in EU-27 countries: a multilevel analysis. *Food Policy*. 56: 25-40.

Sirieix, L., Lála, J. and 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. USDA Foreign Agricultural Service (Bangkok).

Violeta, S., Haugaard, P. and Liisa Lähteenmäki, L. 2016. Determinants of Consumer Food Waste Behaviour: Two Routes to Food Waste. *Appetite* 96 Journal Article: 7-17.

Stewart, D. W., Prem N. Shamdasani, and Dennis W. Rook. 2007. Focus Groups. The US: Sage Publications, Inc.

Takata, M., Fukushima, K., Kino Kimata, N., Nagao, N., Niwa, C. and Tatsuki 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.

Thailand National Statistical Office. 2018. Executive summary: household socio-economic sample survey B. E. 2560 (2017). Accessed 29 May 2018.
<http://www.nso.go.th/sites/2014en/Pages/survey/Social/Household/The-2017-Household-Socio-Economic-Survey.aspx>.

UN. 2016. Sustainable Development Goal 12. Ensure Sustainable Consumption and Production Patterns. Accessed 10 December 2019.
<https://sustainabledevelopment.un.org/sdg12>.

Wang, L., Liu G., Liu, X., Liu, Y., Gao, J., Zhou B., Gao S. and Cheng S. 2017. The weight of unfinished plate: a survey based characterization of restaurant food waste in Chinese cities. *Waste Management* 66: 3-12.

Yu, Y. and Jaenicke, E. C. 2018. Estimating household food waste using food acquisition data. *SSRN Electron. Journal*.
<https://doi.org/10.2139/ssrn.3257535>.