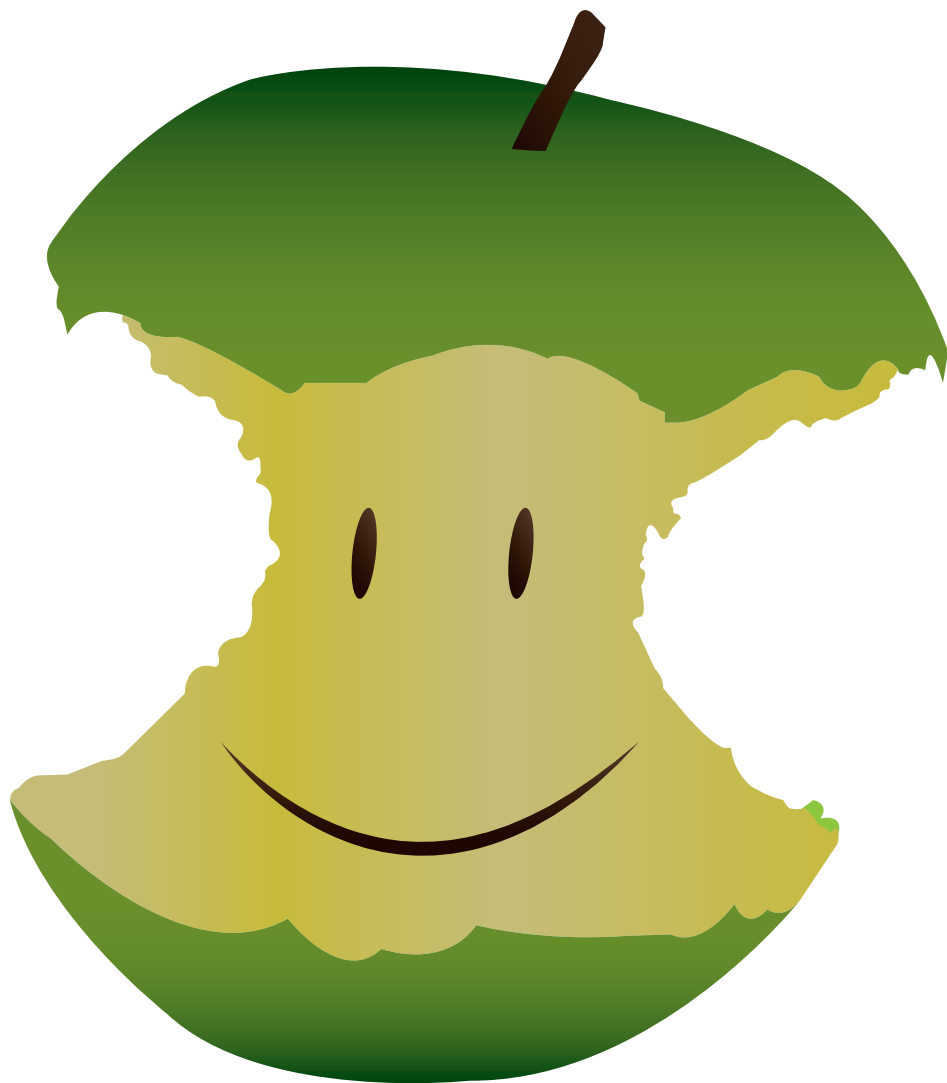


DESIGNING A **SOLUTION** FOR **FOOD WASTE** REDUCTION



Title page

Title: Designing a solution for food waste reduction

Name and study number:

Agnes Pärn 20142763

Supervisor: Anna Marie Fisker

Extended Master's thesis

MSc Integrated Food Studies

Aalborg University

Style of reference: Harvard

Total Number of pages: 119

Report Size: 45 ECTS points

Printed reports: 2

Appendixes: 3

02.06.2016

Word Count

?

×

Statistics:

Pages	100
Words	32 277
Characters (no spaces)	161 726
Characters (with spaces)	194 403
Paragraphs	520
Lines	2 656

☒ Include textboxes, footnotes and endnotes

Close

Abstract

Food waste occurs throughout the entire food supply chain. Food waste has serious environmental, economic and social consequences. According to estimates by FAO (2013), each year, up to one third of the food produced for human consumption is either wasted or lost before it reaches consumers. In Europe, most of the food waste occurs at final consumption phase. In Denmark 700,000 tons of edible food is discarded every year. Households contribute 260,000 tons of food waste per year to that total. Education is the first step towards reducing food waste at the consumer level. There are many policies and initiatives throughout Denmark seeking to reduce food waste. The most pressing need at present is to bring greater recognition to the problem and education regarding food waste.

The aim of the current paper was to design new ways to educate customers of the Rub & Stub restaurant and the WeFood supermarket. The method focuses on teaching the consumers to reduce their own household food waste. In addition, this Master's thesis also sought to investigate the determinants of household food waste. The gathered knowledge was then used to create a new conceptual design to educate people.

Semi-structured interviews of several customers who frequent two unique food establishments in Copenhagen was selected as the primary research method of this study. The theories, tools and models that were used in this study include: design thinking, Persona, storyboard, mood board, netnography, mapping & touchstone tours and social practise theory.

The study reveals that the two food establishments also have the potential to be educational facilitators. The main attributes affecting household food waste are: shopping routines, planning skills, leftover reuse, packaging sizes, income, household size and composition, feelings of guilt, waste management and knowledge of food labels. Based on the findings, a new game/quiz was developed for adults, and a treasure hunt for children, which will be implemented at both food establishments.

Based on the results it can be concluded that improving consumers' food related skills reduces food waste. There is a need for further education about food waste and the new conceptual design solution can offer that.

Keywords: food waste, consumers, design thinking, social practise theory, mapping, touchstone tours, persona, storyboard, netnography, mood board, consumer education

Acknowledgement

I would like to express my gratitude to my supervisor Anna Marie Fisker for her support, patience, devotion and immense knowledge. Her guidance helped me tremendously and I could not imagine having a better supervisor for my Master's thesis.

I would also like to thank all the individuals who were willing to participate in the interviews. Likewise, I would like to thank my family and friends for their support. I also would like to acknowledge the editing assistance of my aunt Katrin, whose technical support and encouragement was invaluable for finishing this thesis.

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Glossary/Abbreviations

The definitions below are based on the FAO report: “Food wastage footprint: Impact on natural resources, summary report (FAO 2013).”

- **Food waste** - refers to discarded food that is appropriate for human consumption. Often this is due to spoilage, but can be attributed to other reasons such as oversupply due to market fluctuations, or individual consumer shopping and eating habits.
- **Food loss** - refers to a decrease in mass (dry matter) or nutritional value (quality) of food that was originally intended for human consumption. These losses are mainly due to inefficiencies of the food supply chain, such as poor infrastructure and logistics, lack of technology, insufficient skills, knowledge and management capacity of supply chain actors, and lack of access to markets. In addition, natural disasters play a role.
- **Food wastage** - refers to any food lost through deterioration or waste. Thus, the term “wastage” encompasses both food loss and food waste.

These terms are defined by the author of this Master’s thesis.

- **Avoidable food waste** - Food or beverages thrown away that were, at some point prior to disposal, edible (pears, bread, chicken, slice of cake etc.).
- **“Bedst før” (“Best before”)** – same as “mindst holdbar til,” -the date label that indicates when the quality of a food product may begin to deteriorate. It does not necessarily mean that the food product poses a health risk after the date.
- **Carbon Footprint** - The amount of carbon dioxide (greenhouse gases) produced directly and indirectly as a result of human activities, usually expressed in equivalent tons of carbon dioxide (CO₂).
- **Developing countries** – Also called “less developed countries” or “underdeveloped countries. Usually a poor agriculture-based country that seeks to develop economically and socially. Not yet highly industrialized.
- **EU** - The European Union.
- **FAO**- Food and Agriculture Organization of the United Nations.
- **IFS**- Integrated Food Studies
- **Industrialised country** – Also called “developed country” or “more economically developed country”. Refers to a country, which is highly developed economically,

and advanced technologically with modern infrastructure as compared to other less industrialized nations.

- **“Mindst holdbar til,”**- Indicates when the quality of the food product may start to deteriorate. It does not mean that the food product itself poses a health risk after the date.
- **ReFood** – A marketing strategy for companies and organizations in the food and service sector, which takes action against food waste and supports recycling.
- **Stop Spilld af Mad** – Non-profit consumer movement founded in 2008 by Selina Juul. It is a consumer organization supporting consumers in their fight against food waste.
- **“Used by date”** – Food products that are close to their expiration date that are often gathered in one place and are sold at reduced price, such as supermarkets.

1 INTRODUCTION

In this chapter, the background and the problem area are presented together with the research question, aim, delimitations, and finally the structure of the thesis itself. This Master's thesis seeks to investigate the determinants of household food waste. The gathered knowledge will then be used to design new ways to educate people to reduce their own food waste. By using existing food waste initiatives as educational platforms, participants can reach out to the wider Copenhagen population. The potential of this concept will be explored by utilizing a design thinking framework.

Undernourishment and food shortages are a global problem, while at the same time there are enormous quantities of food being lost and wasted. Within the past decade, food waste has received increasing attention (Aschemann-Witzel et al., 2015). According to estimates by FAO (2013), each year, up to one third of the food produced for human consumption is either wasted or lost before it reaches consumers. Currently, 795 million people in the world suffer from chronic undernourishment (World Hunger, 2016). The global volume for the edible part of the total food wastage is 1.3 billion, and overall agriculture production sees further annual losses of 6 billion tonnes (FAO 2013). The Carbon Footprint that is left by food wastage is estimated to be at 3.3 billion tonnes of CO₂ released in the atmosphere per year (FAO 2013). Overall, the water wasted to produce the food that is lost or wasted is estimated to be 250km³. To give a better perspective this is equivalent to the three times of the volume of Lake Geneva in the United States (FAO 2013). About 28 % (1.4 billion hectares) of the world agricultural area is used to produce food that is either wasted or lost (FAO 2013).

The figures mentioned above give a greater understanding of the magnitude of the impact that food wastage has globally. These figures are not, however, distributed equally between developing countries and industrialised countries, although food waste is equally high in both. In developing countries over 40% of food wastage occurs after harvest and during processing (Ec.europa.eu, 2015). In industrialised countries, however, 40% of the food wastage occurs at the consumer and retail level (Ec.europa.eu, 2015). When looking at the industrialised countries that fall into the medium/high income countries, the causes of food losses and waste are primarily related to consumer behaviours. These behaviours are also combined with unclear communication between the actors in the supply chain (Gustavsson et al., 2011). Higher incomes are connected to a more careless attitude towards discarding food. This problem is compounded by insufficient purchase planning and lack of knowledge of 'best-before-dates' (Gustavsson et al., 2011). These factors, however, can be significantly reduced

by raising consumer awareness. When looking at recently collected data from Europe, the household food waste problem might be increasing, but at the same time, the data also suggests that specific actions may also alleviate the problem (Aschemann-Witzel et al., 2015).

In the European Union, 100 million tons of food is wasted annually. If nothing changes, this amount is predicted to rise to over 120 million by 2020, (Ec.europa.eu, 2015). The consequences will further complicate ethical, economic and environmental issues. Every actor plays a role in preventing food waste, from the farmer, to the food processor, to the retailer, to the average consumer. The European Parliament has adopted many of the suggestions from the Joint Declaration Against Food Waste¹, whose aim is to reduce food waste by at least 50% by 2025 (Stopspildafmad, 2015).

Currently, in Denmark there is no national plan for food waste. There is however, a strategy to reduce and recycle waste in the form of the “Denmark without waste” initiative, which was launched by the Danish Government in October of 2013 (Fusion 2015). The overall strategy is explained in the Resource Plan for Waste Management (2013-2018), which seeks a “Waste-Free City”. The plan includes a section concerning the development of new business models that are designed to limit food waste and to utilize excess resources. At present in Denmark, there are no taxes on food waste. Waste management regulations, including those for food waste, differ by municipality (Fusion, 2015).

In Denmark 700,000 tons of food that could have been eaten is discarded every year. Households contribute 260,000 tons of food waste per year to that total (Miljøstyrelsen, 2015). In the service, sector the food waste amounts to 227, 000 tons (Miljøstyrelsen, 2015). The cost of the household food waste in Denmark amounts to 11, 6 billion Danish kroner a year, including taxes. This means that the average Danish family (two adults & children) throws out the equivalent of 7,200 Danish kroner per year in food (Landbrug & Fødevarer, 2013) The amount of money that is lost in food waste could feed one million Danish people for a day (Stopspildafmad, 2015). The average Dane throws out 47kg of edible food per year (Stopspildafmad, 2015). A person living in an apartment in the city wastes about 1,4 kg food per week, whereas a person living in the outskirts of the city wastes 0.81 kg (Fusion, 2015). Danes are, however, willing to change their behaviour; about 70% of respondents of a survey conducted by the Stop Wasting Food Movement in Denmark declared that they would support efforts to reduce food waste (Stopspildafmad, 2015).

¹ On October 28th, 2010 the European Parliament in Brussels gathered academics, researchers, members of the European Parliament, politicians, other representatives of international organisations and the civil society in order to take common action in the prevention and reduction of food waste on a global and European scale. Together they constructed a joint declaration against food waste.

Leftovers that are associated mostly with the dinner meal are the biggest contributor to household food waste. The food items that consumers discard the least are: eggs, fish and fresh meat (Stopspildafmad, 2015). The majority of people throw food out 3-4 times a week, but there are very few who do not throw out food at all (Stopspildafmad, 2015). The most common reason for discarding food is that it is too old. This is often due to the fact that the packages are too large and food expires before it can be consumed. For consumers in Denmark, there is a great deal of confusion concerning the labelling: “used by date” and “best before”. These are often misunderstood and force many shops to discard food that is still edible (Fusion, 2015). Another cause can be attributed to certain food items being forgotten in the fridge. By the time, they are discovered the food has deteriorated and needs to be thrown out. This is often a difficulty encountered by single households as food is packed in family size portions. At present about 39% of households are single-households (Stopspildafmad, 2015). A person living alone in an apartment building wastes up to 40% more food than the members of a multi-family household (Stopspildafmad, 2015). Recently, 19% of the respondents in a Danish survey reported that they waste less food than before (Stopspildafmad, 2015). This indicates that campaigns against food waste in Denmark do have a positive impact.

Everyone can play a part in reducing food waste. Small changes in habits that require minimal effort can save money, help the environment, and put stop to excessive food waste. In order to change food waste habits it is first necessary to raise public awareness. 48% of the Danes questioned could recognize the “Stop Spil af Mad” organization, which means the first step is already in place. The most pressing need at present is further recognition and education (Stopspildafmad, 2015). A study conducted in 2013 showed that every second Dane has, in fact, reduced their food waste when compared with the previous years (Fusion, 2015). Danes are open to changes; a study conducted in 2012 revealed that every second Dane would ask for a doggy bag in a restaurant or a café, something that previously had not been popular (Fusion, 2015).

1.1 State of The Art

As a continuation of the introduction, this section will present the reader with a brief overview of the literature concerning food waste in Denmark. The first question: “Why is food waste so prevalent at the household level?” is explored. Second, the causes of household food waste within the EU, as presented by the relevant literature is presented. Third, the challenges in addressing consumer food waste are discussed. Finally, several private and public food waste initiatives in Denmark are presented. The literature included in this section is a mixture of a scientific research, and grey literature from the Danish and an international perspective.

1.1.1 Why is food waste so prevalent at household level?

Household food waste is not a new phenomenon, and in recent years there has been an increased focus on research within the field (Gjerris and Gaiani, 2013). In higher income countries such as Denmark, the greatest amount of food waste occurs at the household level (distribution and consumption) (Stancu, Haugaard and Lähteenmäki, 2015: Secondi, Principato and Laureti, 2015). In the European Union, household food waste constitutes the largest proportion of food waste at 42 %. (Gjerris and Gaiani, 2013). Research has confirmed that consumers are single biggest contributors to the total amount of food waste that is generated (Stefan et al., 2013). Discarded food results in economic losses, environmental degradation and raises serious ethical issues.

The three ways to change food waste are to educate people, which will allow them to change their habits, or to make changes in the way that food is sold by changing the packaging, or to extend the shelf life (Quested et al., 2013). Unfortunately it is not always easy to change and control food products, therefore it is important to educate the consumers.

For most citizens of Denmark food is abundant, cheap and always available. In the last decades, households have changed dramatically, as has the way we look at food. There has been a devaluation of food. It has become perceived as something that is easily accessible and disposable. When compared to decades ago consumers lack knowledge of where the food comes from and what ingredients the food actually contains. There has also been a change in social and emotional associations with food. Having family dinners together daily is no longer a tradition and consequently traditional family recipes are starting to disappear (Gjerris and Gaiani, 2013: Stefan et al., 2013) All these factors affect consumers who no longer see food as

something vital to life but rather see it simply as a commodity from which they are becoming more and more emotionally detached.

Currently in Europe the number of people who live below the poverty threshold (as determined by the EU) is increasing (Gjerris and Gaiani, 2013). Food loss has a large impact on consumers and the overall cost of keeping a household (Secondi, Principato and Laureti, 2015). Consumers themselves often feel guilty and bothered when they waste food, and reducing food waste at the household level would make them feel better morally (Stancu, Haugaard and Lähteenmäki, 2015). Furthermore, reducing food waste at home can have a very positive effect on the environment (Quested et al., 2013).

1.1.2 Determinants of Danish/ European household food waste

This section elaborates on the determinants of household food waste based on the findings of relevant literature. When investigating the determinants of Danish household food waste, studies made in other European countries were also added, due to an insufficient number of studies in Denmark. Comparisons to other countries are valid, but it should be noted that cultural differences do play a role (Stancu, Haugaard and Lähteenmäki, 2015). There have been many studies estimating amounts of food loss, but studies that focus on the actual factors behind these food losses have been few.

Countries, such as Denmark, that have a higher income per capita tend to generate higher percentages of food waste. In addition, it is an interesting fact that the countries where the land is used for organic farming are the same countries where people are less likely to waste small quantities of food (Secondi, Principato and Laureti, 2015).

Some of the main factors that contribute to household food waste include:

- **Household size and composition:** Adults waste more than children, and larger households waste less per person than smaller households (WRAP, 2007).
- **Household demographics:** Studies in Europe suggest that elderly people waste less food than young people. Pensioner households waste the least amount of food. This is due to the fact that these households normally contain fewer people, but it also due to the fact that older people are more focused on saving and recycling, and are often financially restricted (Gjerris and Gaiani, 2013: Secondi, Principato and Laureti, 2015: Quested et al., 2013). Many studies have shown that women tend to waste more food

but are also more likely to take the initiative in reducing food waste when compared to men (Secondi, Principato and Laureti, 2015).

- **Household culture:** For example, in some cultures there are a great variety of dishes, but only a few key ingredients are used. This method generates less food waste (Gjerris and Gaiani, 2013; Stancu, Haugaard and Lähteenmäki, 2015; Stefan et al., 2013).
- **Household income:** One study found that lower-income families waste more food due to the fact they are less likely to plan their shopping and possess a “live in the moment” attitude (WRAP, 2007). However, other studies have shown that more educated people with higher disposable income waste more than poorer households (Secondi, Principato and Laureti, 2015).

In addition to these factors, personal abilities and habits also contribute to food waste. These include: planning skills, cooking skills, shopping behaviours, knowledge about storing food, and misleading expiration dates and data labelling (Gjerris and Gaiani, 2013).

The way we shop for food has changed over time. The new trend is not to plan meals but instead to be more impulsive. In Nordic food shops, about 75% of the total purchases are decided after the consumer arrives in the shop (Gjerris and Gaiani, 2013). There are numerous grocery stores in Denmark, and because there are so many stores, this allows the consumers to visit them more frequently and to buy fewer items. In Denmark, 45 % of the consumers visit the grocery store more than four times a week. In Denmark, more than 90% consumers read the weekly brochures that the grocery stores release to get ideas about what to shop for and where to shop. A survey conducted of Danish consumers showed that they are interested in high quality products and want a large variety of products when they go shopping. This even applies to standard products such as milk (Gjerris and Gaiani, 2013).

A survey of 1062 Danish consumers conducted by Stancu et. al., showed that shopping routines, and the ways that leftovers are dealt with are the most important determinants of food waste (Stancu, Haugaard and Lähteenmäki, 2015). The same study showed that by itself, planning had very little impact on the overall amount of food waste. This is because planning is mediated via other food related routines meaning that insufficient planning may result in over purchasing food products. Leftover routines and planning routines were strongly linked with a person’s household skills, or the way they perceived their capabilities dealing with food (Stancu, Haugaard and Lähteenmäki, 2015).

In a survey conducted by The Danish Environmental Protection Agency of 800 Danish households, it was evident that the most commonly discarded food items are: fruit,

vegetables, bread and cakes. The same study also discovered that a four-person household discards a large amount of processed food, especially leftovers. This does not, however, apply to families with more than four members. By contrast, single-person households throw out mostly non-processed food. This is often due to the fact that the packaging is too large and these individuals cannot buy smaller portions that would fit their needs (Gjerris and Gaiani, 2013).

A research paper, which reviewed some of the studies on food waste in European Countries, concluded that raising people's awareness of the impact of food waste on the environment does not seem to motivate them to change their habits. On the other hand, it was found that people who were already conscious of the environmental impacts of food waste were conscientious about recycling. Individuals who stopped their education at an earlier age tended to generate more food waste than individuals who did not. Individuals who live in both large and small cities tend to waste more food than people who live in rural areas do. In addition, people who separate their kitchen waste or compost tend to throw out less food than people who do not engage in these types of activities. Furthermore, the study found that respondents would produce smaller quantities of food waste if there were a charge on the waste that they generated. The area around our homes also affects food waste. The study found that people who live in areas with less litter are less likely generate less food waste. (Secondi, Principato and Laureti, 2015).

In a study conducted in the UK by Quested et al., it was found that the main contributors to food waste were: planning meals in advance, checking food levels prior to shopping, shopping lists, knowledge of how to store specific food items, the use of a freezer to extend shelf-life of food, portioning rice and pasta, using up leftovers and knowledge of date-labels on food (Quested et al., 2013). The same study found that saving money could be an impetus for people to change their current habits related to food waste. Another fact that could contribute to efficacious change is "guilt". The researchers found that people do not like to waste food, and when they do waste, it tends to make them feel guilty (Quested et al., 2013). Another study made in the UK also found that guilt was one of the primary emotions associated with food waste (Graham-Rowe, Jessop and Sparks, 2014). Therefore guilt could be used as motivational tool in food waste campaigns to change behaviours and compel people to be more environmentally conscious.

A study conducted in Denmark found that consumers have difficulties understanding food labels. The label "best before" causes confusion in understanding and interpreting. As a consequence, food that could have been eaten is thrown out. When consumers were

questioned, 50 % of them thought that the “best before” date indicates that the food item can no longer be eaten (Halloran et al., 2014).

A survey done amongst 244 Romanians concerning their food waste habits showed that their intentions not to waste food did not significantly affect the actual reported amount of food waste. This means that the reasons for food waste are not connected with the intention to waste less, but are more connected with the daily routines of consumers. The study found that when studying food waste among consumers the most important aspects are planning and shopping routines. These are the factors that most significantly contribute to how much food is actually discarded (Stefan et al., 2013).

In a study that interviewed 15 households in the UK, it was found that the main motivation for not wasting food was not only the desire to spend less money on food but also the desire to generate less waste overall. Respondents rarely mentioned environmental consequences as being an influence on their efforts to minimise household food waste. The participants who claimed to have a good knowledge of cooking and storage reported less food waste than people who did not. Many people reported that they throw out food items because they are scared of getting food poisoning, sometimes even before the “before date” of the food item. Thus cooking and storage knowledge are important in relation to minimizing food waste (Graham-Rowe, Jessop and Sparks, 2014).

Based on the previously presented material the main individual habits that affect food waste are shopping routines, planning skills and knowledge of how to deal with leftovers.

1.1.3 Challenges in consumer food waste

This section will attempt to enlighten the reader on various issues that consumers face when attempting to reduce food waste at the household level. The most obvious, and biggest obstacle to addressing consumer food waste is that it is almost impossible for a household to donate their surplus food to other people. In Finland there is a project called: “Saa syöda!”, which attempts to solve this issue. This project has been launched at a housing complex near Helsinki, Finland. In the basement of the housing complex there is a food sharing area, where the residents (approx. 200 people) can share their food (Saa Syödä, 2016). A significant challenge for resolving consumer food waste is the fact that once the food has entered a household, there are very few possibilities to share it with others.

The first step in the fight against food waste is knowledge. It is about creating awareness and providing solutions. The trick is however not merely just to create awareness and find

solutions but to also convince people to implement these solutions. People are adverse to change and remain stubborn in their habits, even if the problems are visible and solutions are presented (Gjerris and Gaiani, 2013).

If the gap between an individual's behaviour and the consequences of their actions is too far apart, then it is easy for them not to be affected by it (Gjerris and Gaiani, 2013). With food waste it is difficult for the consumers to make a connection between what they are throwing out and environmental degradation. In addition, many people might feel that their small individual action is so insignificant that does not have a greater effect.

One of the reasons why reducing food waste is so challenging is due to the fact that people desire to be "good providers". This means that the host or the person responsible for shopping in the household wants to provide an abundant amount of food. This is especially manifest when guests are visiting, as the host wants to provide for the guests and often does so by offering good, healthy and abundant amounts of food. Material goods also express who we are as people. Furthermore, judgments are often based on the material good we have. Therefore, people often wish to show that they can purchase quality, expensive and healthy food in abundance (Graham-Rowe, Jessop and Sparks, 2014).

When choosing food products consumers often choose with their eyes, this means that food items in larger packaging placed on a larger shelf attract more attention, despite the fact that bigger packaging can lead to food waste. Consumers are inspired when they are already at the supermarket and the actual decision of what to buy often comes down to the visual appeal of that product. A study conducted in a large supermarket in Denmark revealed that 85 % of consumers make their decisions without having the actual food product in hand, or without having chosen any alternatives. 90% of consumers only look at the front of the packaging while making their purchasing decisions (Halloran et al., 2014). People often tend to purchase larger quantities because they want to avoid unnecessary trips to the grocery store, and hope to minimize inconvenience in their life. This is applicable for people living in both rural, or urban areas (Graham-Rowe, Jessop and Sparks, 2014).

A study conducted in Denmark concluded that Danish consumers did not associate food waste with climate change or with negative environmental impacts (Halloran et al., 2014). This was also supported by another study conducted by Stefan et al., which also found that consumers do not view food waste as being connected with environmental impact (Stefan et al., 2013). Consumers are often not aware of actually how much food waste they generate at home, because the waste is thrown out bit by bit and is often mixed with all sorts of another waste. Therefore, many consumers feel that they do not waste as much as they actually do and

consequently believe that they do not contribute to the overall food waste problem (Graham-Rowe, Jessop and Sparks, 2014).

1.1.4 Private/public initiatives in Denmark

This section aims to explore what is going on in Denmark regarding food waste. Several private and public initiatives fighting against food waste will be presented below.

Since Denmark is a member of the European Union, they are included in the current European Commission effort to reduce food waste by 50 % before the year 2020 in every member state (Halloran et al., 2014).

Denmark is an interesting case in regards to food waste because there is such a high potential for reduction of food waste. Denmark is a relatively small country with a high standard of living (Halloran et al., 2014). These attributes make it easier to implement and encourage systematic changes within the food supply chain and with consumers.

In Denmark, there is a non-profit consumer movement dedicated to reducing food waste called: “Stop wasting food”. This NGO has more than 8,000 members and the movement was able to successfully persuade the retail chain Rema 1000 to drop quantity discounts in their stores in 2008. Quantity discounts are seen as a contributing factor to generating household food waste because they encourage the consumer to buy more. The overall aim of this movement is to raise awareness of food waste. The movement is supported by members of the European Parliament, members of the Danish Parliament, many Danish consumers, some of the top chefs in Denmark, as well as other famous personalities dealing with food (Stopspildafmad, 2015).

In addition to the aforementioned campaign, another initiative was launched in 2012 by the Danish Environmental Protection Agency called: “Use more, waste less”. The campaign gives tips to consumers on how to reduce their food waste. These tips include such things as: storing food correctly, only making food that will be eaten, saving and using leftovers, getting to know use-by labels (Fusion, 2015).

Arla foods is the largest dairy producer in Denmark. They have adopted a zero waste policy in order to help reduce consumer food waste by 50 % by 2020. Arla aims to do so by redesigning their packaging and portion sizes. In addition, the company is attempting to educate consumers to better plan their food use while purchasing. In addition to the addressing food

waste at the consumer level, Arla also plans to address food waste at the production level by using discarded food as animal feed or in biogas production (Halloran et al., 2014).

Project “Nulskrald” (Zero-Waste), is investigating what people do with their waste in Denmark. The project is evaluating possible behaviour changes that can be adopted in regard to shopping, waste sorting and recycling (Fusion, 2015).

In March 2010, The Danish Ministry of Environment created a task force assigned to finding ways to avoid food waste. Members of the food value chain serve on voluntary basis and seek to reduce food waste. The same Ministry also supports the “Brugmerespildmindre” (“Use more, waste less”) campaign.

In 2012 the Danish Ministry of Environment also established the “Initiative Group Against Food Waste”. This initiative as well as the previously mentioned task force work on voluntary basis, and offers a platform where stakeholders from the private and public sector can meet and work together towards a common goal of reducing waste. After the meetings, 19 major shareholders from various supermarket chains, ministers, hotels and restaurants signed “Charter on Less Food Waste” (Halloran et al., 2014).

The Danish Environmental Protection Agency together with the PlanMiljø and Vestforbraending have developed educational materials for the public schools that are intended for children in the 4th and 6th grade (Fusion, 2015).

The Green Menu Planner is an online kitchen tool that includes inspirational ideas, and menu planning. It is meant for cafeterias and day-care centres and. The online tool allows people to make precise recipe calculations in order to purchase the exact amount of necessary raw materials (Fusion, 2015).

In addition to the previously mentioned campaigns, there are also the “Denmark without waste” and “Refood label”, which were mentioned previously in the introduction.

1.2 Problem Are

Denmark has the most initiatives against food waste in the EU. In Danish supermarkets, there are food waste reduction strategies. There is also a new supermarket called WeFood, which opened this year that sells surplus food. Restaurants who are members of ReFood service, offer doggy bags to customers. The same organization also aims to implement a national sustainable label for cafes and restaurants. The Rub & Stub is a recently opened restaurant that uses rescued food that would otherwise go to waste. There is also a webpage (www.toogoodtogo.dk), which sells surplus food from restaurants after closing time. In 2015, Denmark launched a Food Waste Think Tank, in order to gather knowledge and develop an action plan to combat food waste. These efforts all play a significant role on reducing the overall amount of food waste in Denmark. There are also many other movements and organizations that were too numerous to mention (Fusion, 2015).

In order to reach the goal of a global reduction of food waste by at least 50% by 2025, which was the benchmark set by the Joint Declaration Against Food Waste, there should be more initiatives to educate consumers about reducing food waste (Stopspildafmad, 2015). Education is the first step towards reducing food waste. There are many policies and initiatives throughout the country seeking to reduce food waste, but there should also be a greater focus on education of the consumers. Denmark has been successful in implementing waste management policies (including food waste) but it is still one of the countries in Europe that produces the most waste per habitant (Fusion, 2015).

For example, in the food waste restaurant the Rub & Stub, or the WeFood supermarket that sells surplus food a large amount of food is rescued, but is there also a way to further educate their customers? These food waste initiatives offer to create platforms for reaching out to consumers for educational purposes. Linking food waste education initiatives with existing organizations could be a way of ensuring that the goal set by the Joint Declaration against food waste becomes a reality. It is important to teach people to reduce food waste regardless of whether they are at home, at work, or anywhere else. Not only can new polices and new organizations reduce food waste to a desired level, it is also necessary for individuals to contribute, whether it be in their homes or through their actions outside of the home.

Often food waste occurs simply because consumers do not wish to eat their leftover food. Either they do not have the skills to prepare it to their standards or they lack skills to preserve the food for later consumption in the first place. Another reason is that consumers often lack knowledge of how to cook dinner from the leftover food they have in the fridge. They will then

drive to a grocery store and buy more than they originally intended. This will result in even more food wastage. Consumer education can focus on using the senses instead of relying on the expiration dates. Using the information provided on the labels of food packages in addition to supplementing cooking skills could be the solution to reducing food waste in Denmark. The food waste problem has a harmful impact on the environment and creates negative economic consequences. These consequences affect everyone. However, by reducing food waste, consumers can save their time, money and help their environment.

1.3 Research Question:

How can a design thinking perspective be implemented in order to educate consumers on how to reduce food waste by using already existing food waste initiatives as platforms to reach out?

1.4 Aim

The aim of this thesis is to design new ways to educate customers of the Rub & Stub restaurant and the WeFood supermarket. The education focuses on teaching the consumers to reduce their own household food waste. The Rub & Stub restaurant and the Wefood market were observed and mapped in order to find the best possible design solutions and ways to use these organizations as educational outlets. A thorough examination of the literature related to consumer food waste in Denmark and Europe was undertaken. In addition, an investigation of consumers' practices and views regarding their own food waste was also initiated. Based on the interviews with people living in Copenhagen metropolitan area and previous literature regarding consumer household food waste, educational design solutions were developed.

1.5 Delimitations

This Master's thesis will focus solely on consumer food waste at the household level. The present thesis does not include food waste that occurs during harvesting, processing, and production, nor does it consider the waste that occurs at the retail level. This thesis focuses on consumers who live in the Copenhagen metropolitan area. The thesis does not examine consumers' upbringing and whether that is a factor that influences their food waste habits. The researcher has not tested the developed design solutions. The thesis is written from a Western point of view because the researcher is Estonian and the interviewees are all Danish.

2 INTRODUCTION TO THE CASE STUDIES

This section presents the two case studies: the Rub & Stub and the WeFood, which will serve as a basis for the new design solutions, developed by the researcher. These new design solutions seek to use education to convince consumers to reduce their food waste print. The food waste initiatives are first introduced, and the researcher then reflects upon her own experiences during visits. Mood boards are then presented to give a better picture of the atmosphere at the locations. The floor plans of the case study organizations were mapped by the researcher in order to give better insight into the psychical attributes of the organizations. Finally, the topic of consumer education is discussed to show why it is relevant to use these food waste initiatives to educate consumers on food waste instead of using more traditional initiatives such as awareness campaigns.

2.1 Rub & Stub

The Rub & Stub is a non-profit restaurant located at Rådhusstræde 13 in Copenhagen, Denmark. It is open Tuesday to Wednesday from 17.30 -22.00, and Thursday to Saturday from 17.30-23.00. All of the proceeds from the restaurant go to the Danish Refugee Council. This restaurant is unique in Europe, in that the restaurant is designed to fight food waste in Copenhagen. The Rub & Stub uses surplus goods from the food industry in their kitchen (Spisrubogstub, 2016).

Farmers, food cooperatives, local stores, bakeries, Food banks, and many more organizations, donate the food. The donated food is typically fruits and vegetables as there is something commercially defective about them. Either the size, shape, colour etc. or that the food items are getting very close to the “best before” date and the organization knows that they will not be able to sell the product to the consumer in that time. All the food that comes in is still edible and perfectly safe for the customers (Spisrubogstub, 2016). The major food donations arrive from two supermarket chains that are owned by the biggest Danish grocery retailer Coop Denmark (NewsComAu, 2013).

Not all the food served in the restaurant is donated. Some things must be bought in order to make a full restaurant menu. In the beginning the donated food accounted for around 30 % of the food used at the restaurant, but now the number is much higher. It can, however, vary

from time to time, depending on the donations. The restaurant is always looking for new partnerships with manufactures, supermarkets and any other companies that are involved in the food industry. Their aim is to try to get more donors in order to further reduce food waste in the Copenhagen area, while raising money for charity. New companies are always welcome to contact the restaurant, even if it is only a one-time donation (Spisrubogstub, 2016).

The food served by the restaurant is not outdated, but is rather surplus food that food companies cannot themselves make use of. Often this is due to aesthetic reasons, such as the fruit or the vegetables being misshapen. The Rub & Stub does not accept donations of any food that has been collected by an activist who found it while “dumpster diving”. Although many first time customers or people who have heard about the place do actually think that this is the case (NewsComAu, 2013).

Much of the food arrives after major holidays such as Christmas because after the holidays people do not want to consume leftover holiday foods anymore. Often there are logistic reasons for the food being donated such as for example that the transport costs too much, or it would take too much time to transport, or even just the fact that there may not be enough storage (Spisrubogstub, 2016).

Due to the fact that the kitchen staff never knows what food comes in the menu changes daily. This also makes this restaurant very exciting, because the menu is very dynamic. The restaurant was developed by, and is run by, volunteers. They are behind the bar serving food and drinks, and in the kitchen helping to cook the food. There are also three types of positions where the organizations have hired people in order to ensure everything is run professionally; the floor manager, the project manager, and the kitchen leaders. There are about one hundred volunteers currently working at the Rub & Stub restaurant (Spisrubogstub, 2016).

The researcher is also a volunteer at the Rub &Stub restaurant (+ 10 month) and has visited it many times as a consumer. The restaurant itself is located in the Huset-KBH (Short for Huset). Huset is been open since 1970 and is Denmark’s first and largest culture house. At the culture house, in addition to the Rub & Stub restaurant, there is a board game café, and a small cinema (Huset-kbh, 2016). When visiting the restaurant the customer first walks through a courtyard, which is very cosy, and where there are many people sitting at tables. The Rub & Stub is located on the second floor of the culture house so the customers have to walk by the board game café, where there are often many cheerful young people. It has a lively welcoming atmosphere.

When entering the Rub & Stub, there is a notice board enumerating how much food has been rescued over the past year, as well posters to introduce the concept and policies (second

servings are offered for main dishes, and feel free to take a doggy bag with you). In addition, there are some flyers and a guestbook. In the hall, it is also possible for the customer to look inside the kitchen and see the staff working. When the customer walks into the main hall there is a large stand where the menu of the day is presented. Since the menu changes daily, it is also uploaded on their Facebook page. Next to the stand is a counter (bar area) where the food can be ordered. There is usually always a staff member to greet you when you first enter the main hall. The staff makes sure that the customers are introduced to the concept. The staff speaks many different languages and is always eager to help. The staff table near the bar gives the place an intimate atmosphere. The décor itself is very cosy and warm. The ballroom has a more elegant look, and is especially suited to special occasions. It is brighter than the other floor and also has a grand piano.



Figure 1 Mood Board Rub & Stub

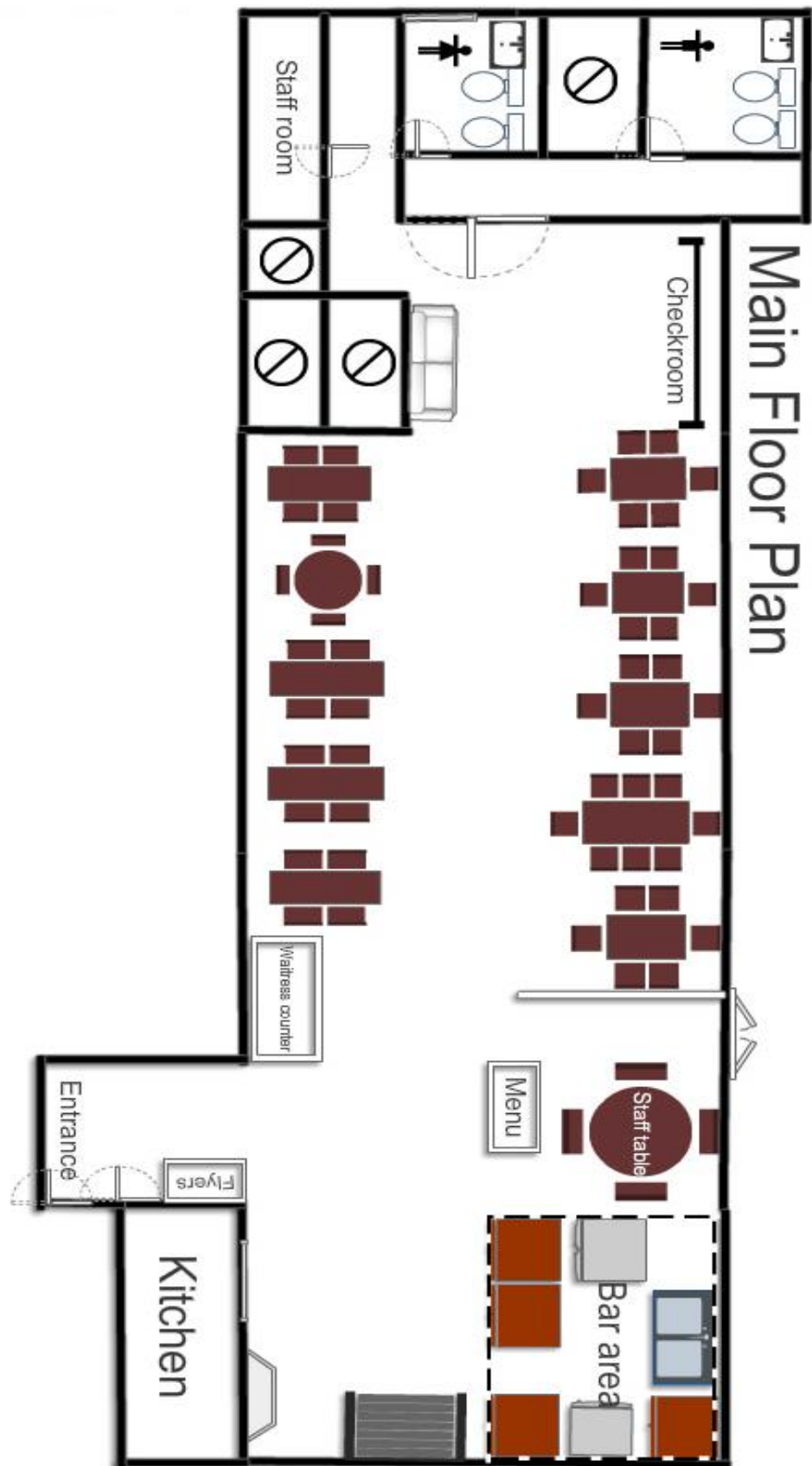
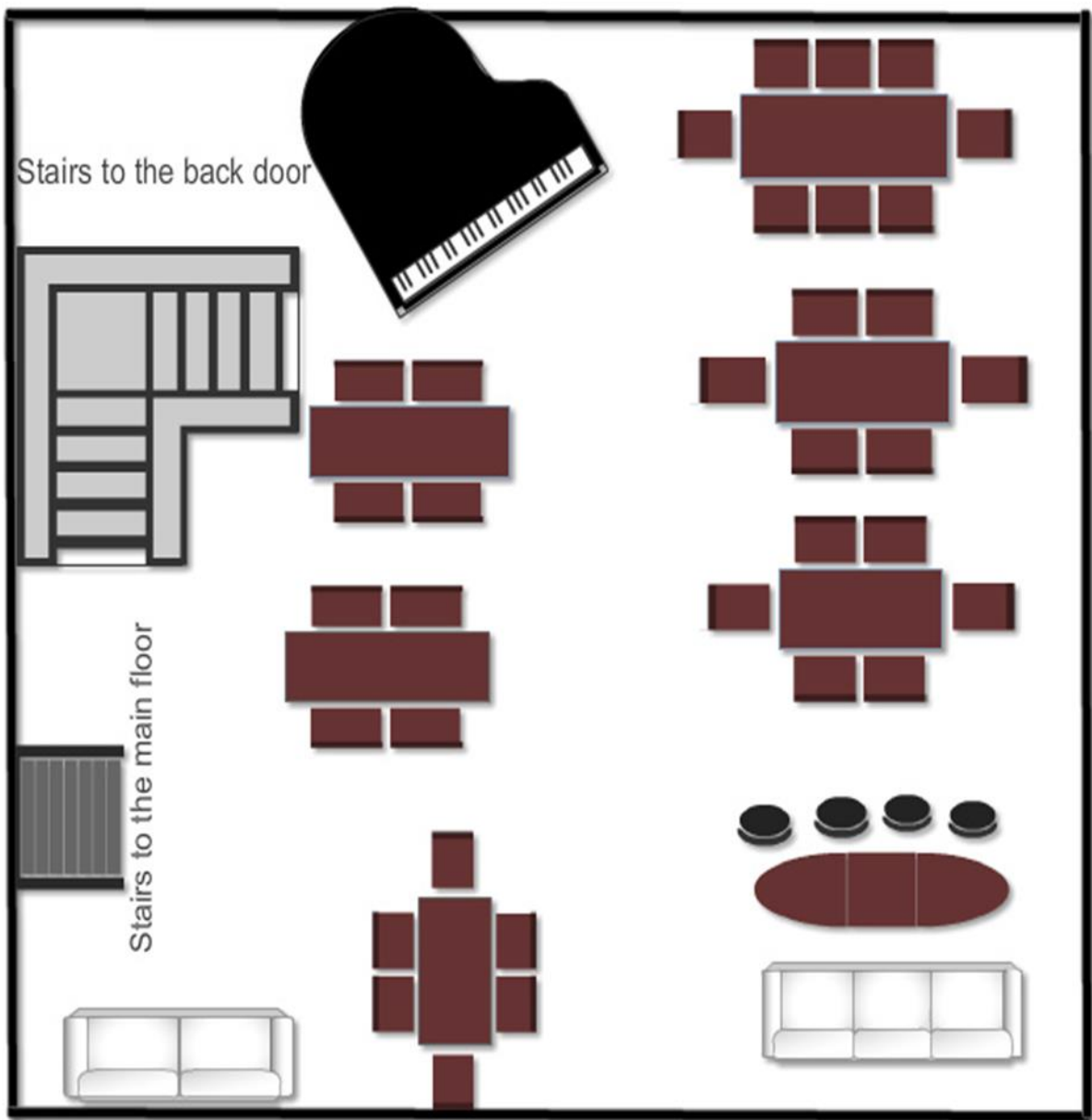


Figure 2 Floor Plan 1 Rub & Stub



Ballroom Floor Plan

Figure 3 Floor plan 2 Rub & Stub

2.2 WeFood

The WeFood market is a supermarket located at Amagerbrogade 151 in Copenhagen, Denmark. The opening hours are between 15.00-19.00, from Monday to Friday. What makes the WeFood supermarket unique is that they sell surplus food. The food sold for sale is still acceptable according to food safety laws, but has lost its market value. In other words, it is perfectly edible surplus food that would go to waste were it not for the market. WeFood sells a wide range of foods and products. All of the offered products were sold in regular supermarkets before, but are approaching their expiration date, or have damaged packing or incorrect labelling, and are not sellable products anymore. If these goods were not given to charity, they would be simply destroyed. The range of products varies. Often the goods sold are products from different holidays that consumers do not wish to buy anymore. For example, there are many Easter related products that become unsellable once the holiday has passed (Noedhjaelp, 2016). There are many donors for the WeFood supermarket, the main one of which is Føtex. Føtex is one of the biggest supermarket chains in Denmark. They donate their expired, food or food that has blemishes. WeFood also has the support of the Danish government (Peterson, 2016).

The entire operation is run by volunteers, and the profits go to the Folkekirkens Nødhjælp. This organization works with and assists the poorest in the world, and seeks to fight hunger. The shop is accessible to everyone. Customers are attracted by the cheap prices, a desire to help a charity, or are simply against food waste. The food prices are around 30%-50% cheaper than in regular supermarkets (Noedhjaelp, 2016).

The WeFood organization could become a model for other countries by demonstrating a creative way for supermarkets to deal with surplus food. WeFood plans to open more supermarkets if the one in the first location is successful (Peterson, 2016).

The researcher visited the WeFood supermarket several times, and will describe the experience of these visitations in the following paragraphs. The WeFood shop has a friendly atmosphere that is created by the volunteers who work there. At every visit they always had a smile on their face. The section that is near the entrance, where the vegetables are kept is very cosy. This is due to the dark paint on the walls and the colourful selection of fruit and vegetables. There are also many small black boards introducing the fruits and vegetables. These are written in colourful chalk, which makes the ambience playful and fun. Near the entrance there is also a small stand with WeFood written on it. There is a space for flyers, newspapers etc. During the visits, the only magazines on display for the customers to read were Nødhjælp's own. Near the entrance on the left side there was another shelf made for

the same purpose as the previous one. At the stand, there was a floor plan on display showing a possible future design for the WeFood supermarket that included making the second room as inviting as the fruit and vegetable area. There was no other information there, although there was space for it.

There are a few small steps that lead the customer from the entrance area to the main room. In the main room the walls are plain white and the shelves, where the food is displayed, are simple or the food items are just stacked. The variety of the products is small. A third area could be seen as well, but it is closed to customers. This means that if more products arrive, there will be space to expand.

There are usually about four people working in the main area or at the check out. The check out itself differs significantly from the ones that are usually found in most supermarket chains. It has no magazines, no impulse products and no adverts. It is very simple, and plain grey. The shop often feels quite empty due to the lack of variation in products and the large amount of space, which is not used for anything.



Figure 4 Mood Board WeFood

3 METHODOLOGY

In this chapter, the methodological framework of design thinking for this Master's thesis will be described in detail. This will give the researcher's overall approach to this thesis. As well this chapter presents the methodological approach used to collect the empirical data. The mapping methods, touchstone tours, semi-structured interviews, the mood board concept, and netnography are introduced and explained in detail. The semi-structured interviews were conducted to gain insight into the target group's habits and views regarding food waste. The mapping and touchstone tours were used to explore various design possibilities, as well as to introduce the some design solutions. The mood boards were a means of introducing food waste initiatives, design processes, and outcomes. Netnographic research was conducted to present consumers' thoughts concerning the Rub & Stub restaurant and the WeFood supermarket. The ethical considerations are presented in the conclusion.

The research presented earlier in the "State of the Art" section provides insight into the existing knowledge concerning the subject and constitutes the baseline for the qualitative research of empirical data collection. In order to find a solution to the research question, the combination of empirical and theoretical data were combined using design thinking and ethnographic perspectives.

A design cloud is used to present the methodological framework in Figure 6.

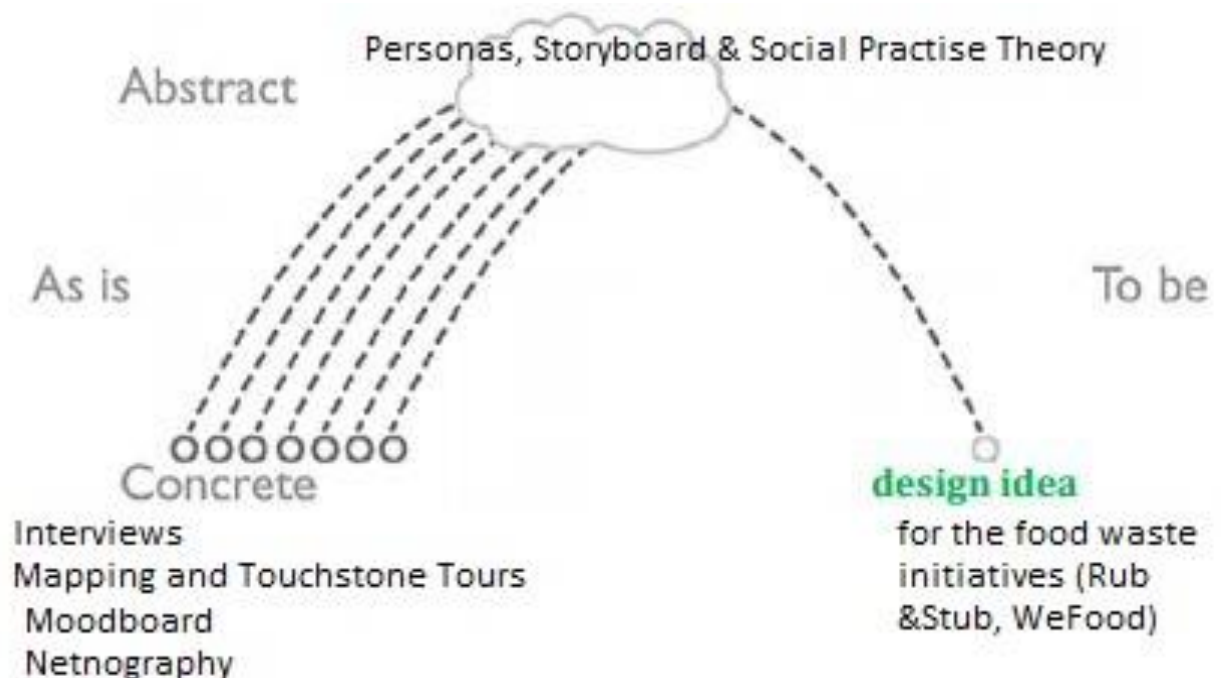


Figure 6 Methodological Framework, The Design Cloud (Bolvig 2013)

Concrete investigative questions such as: “What is going on?” “What is the situation right now?” are questions that are answered via ethnography. The data was collected through interviews, mapping & Touchstone Tours, mood boards and netnography. The data collection process is followed by the analysis process wherein the Persona, Storyboard and Social Practise Theory are applied to analyse the situation as it exists at present. This analysis process allows the researcher to see potential design solutions. Finally, the design solution for the two food waste initiatives is developed.

The qualitative approach used in this thesis provides an insight into the perceptions of the community studied, as well as their intentions and experiences. The quantitative approach provides actual numbers of how many other people share the same thought, intentions, or experiences. (Koch and Vallgård, 2008 p. 49-61). The qualitative method does not deal with large amounts of data. The objective of the qualitative approach is to investigate how the study subjects sense and experience the world. The subjects are selected based on the fact of whether they themselves are individually relevant to the subject being investigated, as opposed to simply representing the target population of the study (Koch and Vallgård, 2008 p. 56).

It is possible to utilize a wide range of data sources when using this qualitative method, because there are no set requirements as to where the data has to fit into a standardised collection model. The data that is collected is not something external that waits to be collected, but is rather something that is produced as the researcher interacts with the subjects. The researcher is not simply a person collecting data, who is removed from the process, but is an active participant in the production of the data (Koch and Vallgård, 2008 p. 57). It is important to realize that any preconceptions that the researcher brings along should not be viewed as an obstacle, or an error, but are rather essential preconditions for the attendant hermeneutic analysis (Koch and Vallgård, 2008 p. 58).

A quantitative approach would have engendered data that would have provided answers only to what was directly being asked. As there was possible risk that data could have been lost using the quantitative approach, and since the author needed to get deeper into an issue and ask questions where a pre-terminated answer could have not been possible, a qualitative approach was chosen. If time had allowed, then the author could have supplemented the quantitative interviews by observing the interviewees in their natural habitat to provide a broader overview of how they act in their environment and how it is compared to what they stated.

In the next paragraphs the ontological perspective of the study and the way it shaped the production of the data will be explained. The influence of the ontological perspective on the

structure of the report and the data will also be summarized. In order to understand the area of investigation and to attain a more complete knowledge of the subject, it is necessary to apply the social sciences. In this regard, the research approach of hermeneutics is of great assistance. The hermeneutic circle means that the interpretation and analysis of data is a constant procedure (Lindseth and Norberg, 2004).

3.1 Hermeneutics

Hermeneutics deals with exploring and interpreting the interviewee's world and interpreting the phenomenon itself. When investigating and obtaining knowledge, the goal is to discern opinions, assessments, motives and intentions and place them in a given context (Launsø, Rieper and Olsen, 2011).

The author should be aware of his or her interpretation of the phenomenon. With awareness it is possible to minimize the affect that the interviewer has on the interviewees, or on the thing that is being observed. The researcher was conscious of her perceptions of food waste. During the research process this understanding would be challenged as new interpretations and new understandings emerged from the interviews and an examination of the data (Launsø, Rieper and Olsen, 2011)

The author utilized the hermeneutic approach in order to find answers related to the ways in which each of the different actors perceived food waste. Each interviewee contributed a part to the overall understanding, and by putting all the different parts together the author was able to gain a more complete understanding of the phenomenon. A holistic view also gives a better understanding of the separate parts. The hermeneutic circle illustrates how each single part creates a more unified understanding and vice versa. (Launsø, Rieper and Olsen, 2011: Lindseth and Norberg, 2004).

3.2 What is knowledge?

Different methods produce different kinds of knowledge. What is knowledge, and how can we be sure that the knowledge we obtain is knowledge in a scientific sense? There are many answers to this and there have been many philosophical attempts to answer this question.

The attempt to answer this complex question was a lifelong pursuit of the philosopher Descartes. He stated that we can never be sure that what we experience is reality, or simply just a dream. Although he did not doubt his own existence:

“I think, therefore I am” (Koch and Vallgård, 2008 p. 45).

His philosophical treatise argued that subject and object are placed opposite of each other and the subject is uncertain about this arrangement. God is an independent factor and therefore both subject and object interactions/relations are real because they are guaranteed by the third party: God. The Figure next illustrates this relationship (Koch and Vallgård, 2008 p. 45).

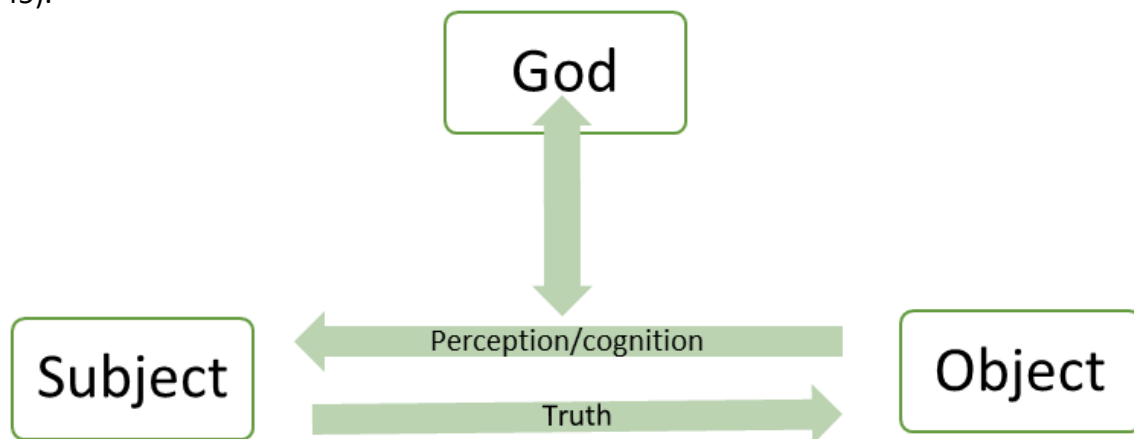


Figure 7 God & Relationship (Koch and Vallgård, 2008 p. 45)

In other words, to make sense of the present, knowledge is not something that exists within a person, or outside in the world, it is something that exists within the relationships between the world and people. The emphasis is not on the individual but rather in the interactions between people and the world.

The aim of this Master's thesis is not to make universal generalisations about how people waste food at home, but rather to develop new methods to educate the Copenhagen metropolitan population to waste less food at home.

3.3 Design thinking approach

There is no single definition for design thinking. As it deals with ambiguity there is a belief that there should not in fact be a common definition. The first reference to design thinking can be traced back to 1969, when Herbert Simon published his book: The science of the Artificial. He was the first to define Design Thinking:

“The transformation of existing conditions into preferred ones” (Mootee, 2013, p.29)

It is the thought that design can be used to improve the future and change the status quo for the better. There is also another definition by Idris Mootee:

“Design thinking is the search for a magical balance between business and art, structure and chaos, intuition and logic, concept and execution, playfulness and formality, and control and empowerment” (Mootee, 2013, p.32)

Design Thinking can have many elements; these are presented in the Figure 8, below:

- A way to take on design challenges by applying empathy?
- An approach to collective problem solving?
- A framework to balance needs and feasibility?
- A means to solve complex or wicked problems?
- A mind-set for curiosity and inquiry?
- A fixed process and a tool kit?
- A problem-solving approach to handle problems on a systems level?
- A culture that fosters exploration and experimentation?
- A design buzzword to suggest that designers can do more than just design?
- A management buzzword sold as the next strategic tool?

Figure 8 What is Design Thinking (Mootee, 2013, p.32)

In a broader sense, design thinking is a framework using a human centred approach to implement strategic innovations. Our society and the physical things around us are in constant flux. This constant change becomes a new management model that creates value in a world that is being rapidly altered with networks and technology. The framework consists of an array of tools, but it is the design process itself that has the most value. Design thinking is about making adaptations to the work process, and using repeated experiments to address challenges related to design problems . (Mootee, 2013, p.3)

Returning to the aforementioned premise that things around us are constantly changing, it should be added that this is a recent phenomenon. In ancient times when stone tools were being developed, the rate of change did not occur as rapidly as it does today. This current state of constant rapid change has brought attendant changes in traditions related to culture, politics and economy. Traditions related to businesses have been changed and disrupted, due to the rapid speed of the changes. For this reason many have turned to design thinking. Design thinking can help companies make sense of the disruption and to ensure that they remain competitive (Brenner, Abrell and Uebernickel, 2016)

The world is more connected than ever before. This has been brought about by the Internet. The Internet has made the world smaller, and people, organizations, communities; technologies are becoming closer than ever before. It has also allowed people to share more with each other. This sharing can take many forms, such as ideas, frustrations, expectations or experiences. This sharing of information has also led to higher expectations, and often people will not accept anything less than the best version of a situation or a product . This is why businesses must constantly adapt, because current consumers get information about a company from places other than TV advertisements. Prices and products must be more targeted, as consumers increasingly want certain things, at a certain time, and in a certain way (Mootee, 2013, p.3).

Businesses in the modern world face many new challenges. For businesses, the management sector faces the greatest challenges. This aspect of business is the most affected by the advent of new technologies and new ways of social communication. The former management approach was designed to fit a different set of business needs that consisted of accomplishing repetitive tasks, improving economic efficiency, and maximising labour and productivity. Current trends have shifted the focus, and the today's businesses must address such diverse issues as dealing with the competition, the economy, job creation, disruptive technologies, social development, natural resource limitations, and sustainability. The crisis in natural resources is an even greater threat than an economic crisis. This is due to the fact that, despite new innovations, modern technologies cannot find ways to balance the growth of consumerism with the limitations of resources. (Mootee, 2013, p.4). Food waste causes significant harm to the environment that is responsible for feeding the human population. Therefore, it is crucial to find ways to reduce food waste. This endeavour can have a beneficial economical effect (FAO, 2013). Design thinking is one approach among many that can be used to solve these issues and accommodate the present needs of the society. Design thinking is a newer smarter way of resolving difficult problems and is also human centred, cultural, social, agile and innovative (Mootee, 2013, p.4).

Design thinking is about balancing three considerations: the technical, the commercial and the human as is illustrated in Figure 9. Technology has helped millions of people to better their quality of life, and yet at the same time it has also enormously changed our way of life and moved us toward over-consumption and the generation of prodigious waste. Innovative ideas of the past have become routine. The traditional techno-centric view of innovation cannot solve the global challenges the world is facing today. This is a fundamental fact and it especially pertains to education, health and poverty. Design thinking is an approach that is innovative, powerful, effective, and broadly accessible. It can integrate businesses and society by generating new ideas and influencing the global challenges that the world is facing (Brown, 2009, p 1-3).

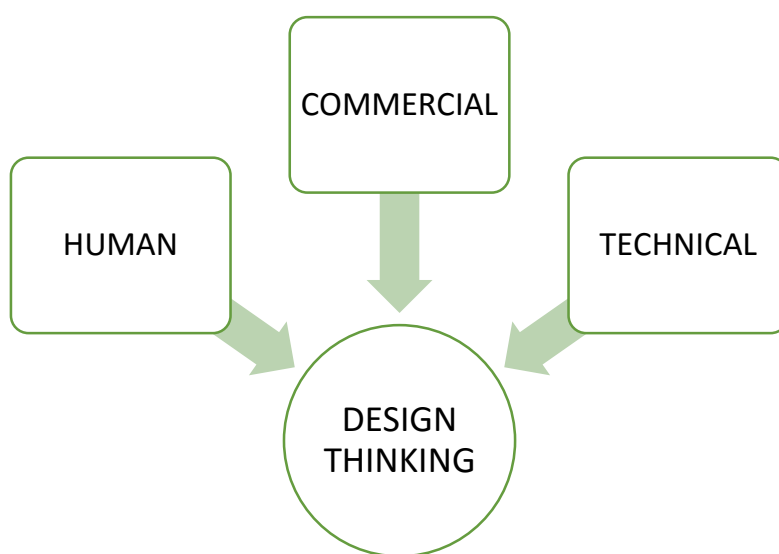


Figure 9: Considerations of design thinking, inspired by Tim Brown (Brown, 2009, p.2)

Conventional design thinking is about designers using the skills they have learned to match human needs with possible technological and financial resources. Design thinking begins with integrating what is desirable from a human perspective with what is technologically feasible and combining it with what is economically viable. This is the method that designers in the past have been used to create new products. Design thinking takes this to the next level. As the world is becoming more complex, innovative and dynamic solutions are required (Brown, 2009 p. 4-7).

In order for design thinking to succeed there are many aspects that must fall into alignment. Only the most significant aspects will be mentioned. The first is the realization that innovation must use a human-centric approach. Innovative products must be made by humans, and be made for humans. Human needs must be at the centre of any project. If human needs remain unfulfilled, then the design solution needs to be reevaluated. The design thinking approach towards innovation differs from the traditional approach towards innovation in that design

thinkers must combine both divergent and convergent thinking (Brenner, Abrell and Uebernickel, 2016). Designers will follow unconventional paths of thought with no fixed points of reference. In this way, the new solutions emerge and the future can be conceptualized in a completely different way. This process is chaotic and ideas can be drawn from very different directions. It is here that convergent thinking must be used to differentiate the infeasible from the feasible solutions and decide which ones are viable (Brenner, Abrell and Uebernickel, 2016)

In design thinking it is perfectly acceptable to fail many times. It is however preferable that failures occur early in the design process. New ideas should be tested by customers to see if they are suitable. To test out a new idea, many prototypes must be built. During the innovation process, the building of prototype is the most important step. It is preferable that the prototypes be made quickly and easily, in order to quickly test them out. Prototypes can just be sketches or paper mock-ups. The faster the prototype or new idea is tested out by the customers, the sooner the designer knows if the concept is actually feasible in real life. The designers' task is to continually interact with the customers. The success of design thinking depends on the prototype's success with the customers (Mootee, 2013, p. 89).

The design process changes continually and the design process never ends. Keeping the design in a constant state of creation makes the innovation process better. This way the designers can design things that are extremely customer orientated (Brenner, Abrell and Uebernickel, 2016).

Design thinking is only possible if the tools and methods that are used are suitable for this new way of thinking. There is a wide range of methods for applying design thinking. In the past 10 years, 47 different tools and methods of data collection have been designated, and are delineated by Schindlholze (Brenner, Abrell and Uebernickel, 2016). The tools come from a wide range of areas such as: ethnography, informatics, researcher in communication, quality management and researcher in creativity. It is not possible to mention all of the tools but some of them include: stakeholder maps, empathy maps, Personas, observations, storytelling, the 5-Whys and the AEIOU-Method (Brenner, Abrell and Uebernickel, 2016).

It is essential to recognize that the design thinking approach is not exclusively meant for designers. All of us have the natural ability to engage in design thinking. Design thinking is an approach that supplements and improves the already existing techniques, behaviours and skills. Design thinking can be, in its own way, an analysis that focuses on forms, relationships, actions, and human relations and emotions (Mootee, 2013, p. 39). The author of this thesis is not a designer. However, she has studied a holistic way of thinking and gained a general overview of the human-centred approach behind design thinking.

3.4 Mapping & Touchstone Tours

Mapping is a way of describing and measuring the world, as it exists in the present. Mapping has the ability to mirror reality, and to communicate informational content between people, places or times. Mapping can be used to help to create and built the world. Mapping also allows a researcher to be analytical, and construct arguments advocating for changes to existing environments (Corner,1999, p. 213; Cosgrove, 1999 p.2).

Mapping also allows a researcher to re-shape existing realms. In addition to things that are known, it can help to uncover previously unseen realities. Mapping can uncover dimensions, attributes and relations that were previously inconceivable or unimagined. Mapping allows the creator to include not only the physical attributes of something but also to incorporate local news events, historical events, market structures, and political influences. This gives the researcher a deeper understanding of social process.

“Although drawn from measured observations in the world, mappings are neither depictions nor representations but mental constructs, ideas that enable and effect change.” (Corner, 1999, p.250).

By mapping the physical attributes of the Rub & Stub restaurant and the WeFood market, it was possible to show possible design solutions that could be implemented, as well as present some general food waste initiatives. Mapping was also used in design process and when generating new design solutions and presenting them to the reader.

The touchtone tour is a guided tour, wherein the researcher gains insight into the user’s world. This allows the researcher to see how the user organizes information and systems via their use of space and cognitive artefacts. Touchtone tours can be used to map many different entities, from large-scale multilevel shopping malls, to small-scale environments to even everyday objects such as handbags, or the digital sphere such as a desktop interface. Users are typically relaxed in their own environment, hence they are often keen on sharing information concerning the space and objects with the interested researcher. The conversation during the tour should be flexible, but can be formalized to some extent. In this way, the user determines the most salient aspects of the tour, and the researcher can focus on attentive observation. Documentation of the tour should be done with video, photos, or sketches, together with a transcript of the conversations. The touchstone tours help to explore a territory and become familiar with it. The outcome could offer suggestions for general design implications (Martin and Hanington, 2012, p.184).

For this master thesis, the researcher used pictures, sketches, observations and conversations to document the touchtone tour. This documentation method allowed for the presentation of case studies and enabled the physical mapping of the Rub & Stub restaurant and WeFood supermarket. It also gave insights into how the customers of both businesses interact with the surroundings while visiting these establishments and made it possible to discern their communication and psychical touchstones. The resulting maps were then used to explore design solutions of ways to educate people on food waste. The data collected was also used to make a Storyboard, which will be presented later on in data analysis in chapter 6.

Both of the tours were documented with photos and notes. The notes included the things that could not be captured on pictures like feelings, noises etc. and the conversations that were held while observing.

3.5 Semi-Structured Interviews

Below is a brief description of the interview participants, which lists their age, occupation, as well as a short description of their living arrangements, and the income level of the household they live in.

Name	Age	Occupation	Description
Katri	27	University Student (Sociology), Part time work as waitress	Single living in an apartment. Low-Income.
Maria	26	Office assistant	Living in apartment with her partner and a child (4 years). Low-income.
Peter	33	Advisor, Danish FSA	Single living in an apartment. High-income
Sara	43	University Student (Integrated Food Studies)	Living with her husband and 4 children (ages: 5-18) in a private house. High-Income.

Table 1 Description of interview participants

For this thesis, a qualitative research interview was chosen because the aim was to understand and gain knowledge about the interviewees' viewpoints, experiences, intentions, motives and to see how these experiences affect the individual. The interviews were conducted to help the researcher understand the interviewees' attitudes to their own food waste behaviour. In the qualitative research interview, the interviewer asks a question and the interviewee answers freely in their own words. The answers do not fall into predefined categories. In this study interviewee and participant are used interchangeably and refer to the person who is being interviewed. The person conducting the interview is referred to as the interviewer or researcher (Koch and Vallgård, 2008p. 63-64; Kvale, 2007). This way of conducting an interview supports the central components of the user-centric approach of design thinking.

A semi-structured interview was chosen as the most suitable method for collecting the empirical data. Prior to the interview the researcher prepared topics to discuss. The interview questions were written down prior to the interview. The interview was designed to let the interviewee speak freely, and later to follow up with questions based on what the interviewee has answered. In a semi structured interview the researcher determines the length of the interview and it is their task to make sure all the topics are covered within a given time period. Focus is placed on ascertaining how the interviewee themselves perceive their environment, how they understand it, and why they act the way they do (Koch and Vallgård, 2008 p. 64). As is mentioned in the design thinking chapter, the aim is to gather data while gaining empathy and understanding for the end-users, and attempting to find new solutions. It is important that the researcher enter the interview situation with an open mind, as the information offered by the interviewees could be something that has not been considered by the researcher before.

An interview is essentially a conversation between two people. The interviewer and the interviewee together create an invisible space, wherein the framework of the interview is constructed. It is important for the interviewer to acknowledge their own prescriptions beforehand and during the interview. In this thesis, the interviewer and interviewees work as co-creators to generate new knowledge. The conversation that takes place in an interview, however, differs from a conversation that takes place between friends and family. This is due to the fact that the topics are preselected, and the freedom of exchange is more limited especially in regards to topics. The semi-structured interview also differs from the clinical interview wherein a patient and a professional hold a conversation. In this case, the topic to be discussed is often determined by the patient (Koch and Vallgård, 2008 p. 65).

For this thesis, the participants were interviewed individually. The advantage of this was that the interview participants would feel relaxed, and could discuss things that they would

otherwise feel uncomfortable admitting in the presence of strangers. Although food waste might not seem like a deeply personal matter, people are nevertheless sensitive to being perceived as someone who excessively wastes food, or does not think of the environmental cost of food waste, or other related negative aspects of food waste (Koch and Vallgård, 2008 p. 66).

The disadvantage of the qualitative research interview is that it produces volumes of data that requires a lot of work to structure and analyse. Another disadvantage is that to a great extent the quality of the studies relies on the individual interviews. This puts more pressure on the researcher to be highly observant, patient and perceptive during the course of the interview. If the interview fails, it is impossible to repair it, and although a new interview can be conducted, both the interviewer and interviewee are more self-aware. The advantage of qualitative research is the assurance that the obtained data is quite detailed. The method is also suitable for instances when the researcher wishes to gain insight into the life situations of other people. These interviews provide unique data about the participants' life (Koch and Vallgård, 2008 p. 84-85).

A sampling of possible participants for the interview was carried out in order to raise greater awareness of the phenomena of food waste and its wider implications. The snowball method was used to find participants for the interview. This was necessary because initially the researcher had no specific people in mind for the interview. The aim was to contact people the researcher was already acquainted with and ask them for assistance in establishing contact with possible candidates who possessed the suitable characteristics (Morse, Swanson and Kuzel, 2001 p. 193). The chosen interview participants had either visited the Rub & Stub or the WeFood market, or had heard of the establishments, and could see themselves as potential customers.

The number of interview participants, which was chosen by the researcher, was also dependant on the time, money and the study objectives. Some argue that once the researcher starts to hear the same things over and over again, it is time to stop the interviews, because there is no longer new information coming in (Koch and Vallgård, 2008 p.71).

The target group for the participants were families and single households. This allowed the researcher to gain a broader perspective of the problem area. Two participants were mothers with children, who lived with partners. Two participants were single and lived alone without roommates or other family members. Research shows that a single household generates approximately 98.8 kilos of food waste per year, whereas in a household of two people the amount of food waste is about 65 kilos of food per year (Stopspildafmad, 2016). As single households generate the highest amount of food waste it was crucial to include them in the

research. Families were also included in the study in order to give another perspective. One family consisted of three members, and another family consisted of six members. The study sought to establish the proportion of food waste based on the size of the families. For a household of three members the amount of waste generated was 67, 6 kilos of food per year, while for a family of six, the amount of waste was 52 kilos per year (Stopspildafmad, 2016).

Before making the interview guide, the researcher extensively studied the topic of food waste and gained a comprehensive overview of the most up-to-date literature. First, the research questions were initially formulated using theoretical language, and from them the interview questions were later developed into everyday language. This ensured that the questions were easily understood yet would still cover all the important areas within the research field. This process followed the template provided by Kvale (Kvale, 2007 p. 59). The interview guides can be seen in Appendix 1.

One pilot interview was conducted before the actual interviews. This allowed the researcher to test the interview guide and make corrections where needed. In addition, it also facilitated the researcher's skill development (Koch and Vallgård, 2008 p.68). The data of that interview is not included in this thesis.

In total four semi-structured interviews were conducted over a 9-week period in 2016. The three interviews took place at the participant's home, and one of them was held on the campus of Aalborg University. The home environment was preferred as it allowed the participant to feel comfortable in their surroundings. It was also more convenient as the interviewee did not need to spend extra time going to a specific location. The interviewee was also given the possibility of choosing a café or any other place. Each interview lasted approximately 30 minutes. All of the interviews were recorded as this allowed the researcher to fully concentrate on the interview with fewer distractions. The interview began with an introduction to clarify the theme of the interview. This was followed by an explanation of the purpose the interview and how the interview data would be used for the Master's thesis. The interview guides were the same for all of the interview participants.

3.6 Mood board

A mood board is a creative communication tool, which is mostly used as a part of design process. It is also used in situations where knowledge will be exchanged or developed visually (Cassidy, 2008).

There are no set requirements or guidelines that constitute the quality of the mood board. This makes the assessment of quality very difficult, especially for students. Mood boards can be cheap and are an efficient way to communicate ideas. Mood boards consist of either everyday or made-up images. The mood board can also be three-dimensional; it is not uncommon to add different objects to the board in order to communicate an idea or work process. Anything can be used to construct a mood board: collages, samples of fabrics, objects, personal drawings, and much more. The way the mood board is set up is the choice of the creator. The mood board can be constructed from paper of various sizes, or from a sheet of cardboard or foam board. The general purpose of the mood board is to assemble the pictures, materials, and text together in order to convey an impression of the “atmosphere” that the author is trying to communicate. The mood board can define things that would otherwise be hard to communicate such as values and emotions. (Garner and McDonagh-Philip, 2001).

In terms of mood boards, abstract imagery conveys a mood better than figurative images do. Successful mood boards show how the design evolved, by linking the end of the design process end with the start of the design. If designers seek to solve a design problem or look more deeply into a problem, a mood board is an excellent tool. It is a good problem solving and problem probing design tool (Garner and McDonagh-Philip, 2001).

Before physically constructing a mood board the creators should ask themselves what they are trying to achieve, and whether they wish to communicate a perception or whether it is a private exploration. It is important to acknowledge that the use of some materials that are widely recognisable can hinder the recognition of innovation. The best method is to create the mood boards early on in the process and then further develop them by eliminating problems and dead ends as time passes (Garner and McDonagh-Philip, 2001).

In this thesis, the mood boards are used to introduce the settings of the two food waste initiatives as well as introduce some new ideas for these locations in their attempts to ameliorate food waste. The use of mood boards is of great value in Design Thinking because they can integrate and support problem-finding and problem-solving strategies.

3.7 Netnography

Netnography is an online marketing research technique that seeks to provide insights into consumer behaviours. It was developed by Robert V. Kozinets. Netnography is similar to ethnography, but also differs from it in that it focuses on online communities instead. When compared to the traditional methodology of ethnography, netnography is less time consuming, simpler and less expensive. The method is also more naturalistic and inconspicuous than traditional ethnography (Kozinets, 2002). In this thesis, the researcher utilizes the principles and technique of netnography to gather information about customers and their views of the Rub & Stub and the WeFood market. The framework of netnography is used in order to give structure to the habits of consumers online.

Nowadays consumers make brand and product choices based on computer-mediated communication. Consumers connect with others, share ideas, build connections, and build communities using various online platforms such as Web sites, newsgroups, chat rooms, etc. Online communities discuss a wide range of consumer related concerns, from fast food to cars. Many consumers are active in the online communities and can have either a positive or a negative effect on a brand. And in addition to exchanging ideas about existing products, online communities help to shape the tastes, desires and decisions of consumers (Kozinets, 2002). In the present study it was found that including the opinions and views of the consumers of the food waste initiatives was necessary, as it would facilitate a design of the best possible solutions to fit their tastes and desires. This finding also highlighted areas that could use improvement as far as overall food waste is concerned. The initiatives proposed by the new design solution had a positive effect on the organizations.

The first step to conducting a netnographic study is to have a specific research question in mind and then to identify the online forums that are relevant to the research question. The next step is to learn about the forums and the users of these forums. There are approximately four different types of online communities that are useful when conducting market-coordinated netnography. The first are boards, which are also called newsgroups, and regularly focus on one particular product, lifestyle or service. The newsgroup can for example be about cheese, or travelling to Siberia. The second type is independent Web pages, and Web Rings such as the webpage: www.epinions.com, where consumers worldwide can exchange their thoughts. The third is e-mail listing management sites, where users can construct their own mailing list. The fourth is different chatrooms (Kozinets, 2002). The communities that were the most pertinent for this thesis were, the review sections of the Facebook pages of the Rub & Stub and the WeFood market, where their customers can give feedback and present

their viewpoints. In addition to the Facebook data gathered by the researcher, every other possible kind of public posts on Facebook mentioning the WeFood or the Rub & Stub (mentioned is synonymous with tagged, meaning that the person who made the posting knew that clients and management from the WeFood market and the Rub &Stub could see the post as could the general public, who has access to Facebook) were also utilized.

When using online communities as sources several things must be taken into consideration. The preferred sources will be communities with high traffic and a large number of posts and participants, or webpages with a topic related to the research question, and extensive sharing of data between members. These characteristics make it possible to adapt ethnography to the online context. These aspects also create a distinction between traditional ethnography and netnography (Kozinets, 2002). It was found that the Facebook pages about food waste initiatives had the highest traffic and the most communication about the organizations.

After choosing suitable online communities, the researcher can then begin to collect suitable data. Initially, the researcher must directly copy the data of member interactions of the online communities. Then the researcher narrows the data based on his or her observations of the members and the community as a whole. The benefit is that the transcriptions are already present. This makes the data collection process faster, cheaper and easier. It is important that the researcher sort through the data and decide what to retain and what to eliminate. This process should be guided by the overall research question/aim (Kozinets, 2002). As the researcher sorts through the data, the result should reflect the consumers' attitudes towards food waste initiatives and possible suggestions for improvements.

Collection of data should last until there are no new insights being generated. The amount of data to include depends on the members, and on the size of the online community. A relatively small number of messages can still offer meaningful conclusions. However, this is possible only if the messages collected present a certain type of descriptive richness and are analysed properly. Making reflective field notes ensures that the collected data gives deep insight into the research subject, although many researchers do not take notes (Kozinets, 2002). For this research, no notes were taken for the data collection concerning consumers' food waste initiatives.

There are also ethical differences between traditional ethnography and netnography. Some questions that arise concern whether online communities can be considered public or private domains and what does it mean to have informed consent in an online community? If a certain kind of anonymity is guaranteed, then scholars by and large approve of the use of online material, although the conventional guidelines to reassure anonymity are still yet to be developed. There are however four recommendations by Kozinets. First a researcher should

reveal their presence during the research of online community members. Second the researcher should ensure anonymity of the members. Third the research should seek feedback from online community members. And finally the researcher should be aware of the private vs public issue of online communities (Kozinets, 2002).

3.8 Ethical considerations

The qualitative research methods used in this Master's thesis involved collecting data from people and about people, therefore ethical considerations are extremely important and the researcher must ensure that the rights of those who are involved are protected (Thomas Bjørner, 2015 p. 53).

There is a tendency for an anthropological researcher to enter into personal close relationships with the people and the places involved. The researcher must remember to keep his or her distance in order to be objective. Ethics concern all elements of this Master's thesis from the choice of the research problem to interaction with the people and environments studied (Koch and Vallgård, 2008 p. 114).

The interview participants were informed of the purpose of the present thesis, why they had been chosen, the background of the researcher, what types of questions they will have to answer, that it is possible to opt out of the study at any time, and how their answers would be used in the paper. They were assured of complete anonymity. The researcher made sure that the interview would not bring any acknowledgeable harm towards them (Koch and Vallgård, 2008 p. 115).

The researcher gave chocolates out to the participants. This was done because the researcher felt it was suitable in that given context. Tjørnhøj-Thomsen has stated that:

"What, for instance, does it mean not to cause harm in a specific situation, and when has the researcher provided sufficient information about her research? Where does one draw the line for violation of privacy? In these questions the researcher must look into "situational ethic", this combines the knowledge and insight about the empirical circumstances with a sense of what is right, responsible and human." (Koch and Vallgård, 2008 p. 114)

In some cases problems can arise when any type of payment is made available, it might seem as the researcher is trying to exploit their subjects. In this case, it is evident that the offering of a chocolate did not exploit or harm anyone in any way as it was more a gesture of thanks

for taking part, and the object offered was something of little value that could easily be rejected.

During the fieldwork and observation, the researcher should always gain consent, although it is often difficult to gain consent from everyone that the research seeks to incorporate (Koch and Vallgård, 2008 p. 115). During the observations at the Rub & Stub restaurant and the WeFood supermarket, the staff was informed that the organization was being observed but the customers were not.

While taking pictures of the Rub & Stub restaurant and in the WeFood supermarket, the researcher did not capture any recognisable faces, and the focus was on the surroundings and on different objects.

Personas are characteristics of the target group interview participants. The researcher's aim was to create a composite of the people of the target group and merge them into one Persona in order to ensure the anonymity of interview participants. The faces used are fictional.

While collecting the reviews and opinions of the customers of the Rub & Stub and the WeFood under the guidelines of netnography, the researcher did not have consent to do so. But since the page is open and people who write there are informed that it is a public space, the researcher felt it would be acceptable to present their opinions as long as their anonymity could be guaranteed.

4 THEORETICAL FRAMEWORK

The theories presented in this chapter are also used in the “Analysis and Results” chapter to organize and analyse the gathered data. The theories were also used to develop the design idea discussed in the “Idea development phase” chapter. Social practise theory is presented first, followed by the Persona concept, then Storyboards, and finally, educational marketing. Educational marketing is presented in order to show the link between the attempt to educate consumers about food waste and their choice of one particular food waste initiative over another

4.1 Social Practice Theory

Social practise theory (SPT) is a framework used by social science researchers to explore how different individuals in society affect their world and their surroundings. The aim of this thesis is to actuate behavioural changes in consumers in regards to food waste initiatives. There are many models of consumer behaviour, but most of these models ignore the fact that the practises, preferences, and actions of consumers are developed within a social context and therefore are inadequate when it comes to explaining behavioural changes. Social practise theories offer an approach to allay these limitations (Holtz, 2004).

In general, social practises refer to the everyday tasks that are performed within a society. These could be going to work, shopping, taking out the trash etc. These are not just simple actions but are rather meaningful to people and have a significant role in their everyday life. Often these aforementioned actions become chores. They also incorporate many other different types of elements, such as material artefacts, knowledge, emotions, skills etc. For example, when taking a shower the frequency, the amount of water used and the duration of the shower will depend on some sort of specific standard of cleanliness (Shove, Pantzar and Watson, 2012). These small actions have a large impact on societies, and resources. An understanding of the social mores behind these actions could possibly be the key to actuating behavioural change towards reducing resource consumption (Holtz, 2004).

The way people behave and their preferences and practises are developed in a social context. In order to understand shared social behaviour, it is insufficient just to study an individual (Holtz, 2004).

SPT is derived from the theories of scholars such as Giddens and Bourdieu who focus on human agency as the point of origin for understanding social systems. Giddens sees social practises as the nexus between actors and structure (Giddens, 1984, p. 1-2).

"The basic domain of study of the social sciences, according to the theory of structuration, is neither the experience of the individual actor, nor the existence of any form of societal totality, but social practices ordered across space and time" - (Giddens, 1984, p.2)

The definition of "practise" is presented here by Reckwits:

"A 'practice' ... is a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge." – (Reckwits, 2002)

"A practice – a way of cooking, of consuming, of working, of investigating, of taking care of oneself or of others, etc. – forms so to speak a 'block' whose existence necessarily depends on the existence and specific interconnectedness of these elements, and which cannot be reduced to any one of these single elements."- (Reckwits, 2002)

A practise is an action that is performed and generated by individuals. New individuals are continually recruited and conditioned to adopt certain forms of a practise. Individuals are seen as the carriers of a practise, and they do not freely choose a certain practise but are rather recruited into it via their history and background (Reckwits, 2002). An overview of the literature about SPT reveals that there is no universal, or fixed list of elements that contribute to the establishment of a practise (Holtz, 2004).

Shove et al., suggest that material may play a role in social practises. This perspective was neglected in the earlier practise theories, but becomes significantly more important when

studying food waste and consumption. According to Shove et al., a practise is an alignment of three components: material, meaning and competence. The specific nature of these components as well as their meaning will be explained further in detail in the next section (Shove, Pantzar and Watson, 2012). According to Shove, individuals link all these components together when they perform various practises in their everyday life. SPT does not focus on the order in which the components are placed in regards to each other, nor does it explain why some elements can create successful practises for a society and why other components of elements do not succeed (Holtz, 2004).

This next section introduces the conceptual framework that is based on the social practise theories with an emphasis on the components aspect introduced by Shove et al. In this framework, people who perform certain practises while integrating the components are processing the linkage between the components. It emphasises that individuals integrate components, and the components provide a point of entry into the organizing framework that guides the analysis by enlightening the areas of interest. This is what helps to understand social practises. It also provides a higher level of abstraction from the data than the other approaches that focus more on the individual (Holtz, 2004).

Three elements of practise: material, meaning and competence are taken from Shove et al. (Shove, Pantzar and Watson, 2012, p. 13-14). In order to introduce the components, they are illustrated using the concept of “going to the university “.

- **Material**-Including all tangible psychical aspects, technologies, and the things of which objects are made. All the material artefacts that our body interacts with, during different activities in our day. For example, a person can go to the University by car, by themselves, by organizing a car-pooling, by bike or taking the bus. Taking the bus will involve buying the ticket, taking a seat etc. (Shove, Pantzar and Watson, 2012, p. 14 & 45-47).
- **Meaning**- Things where we include symbolic meanings, aspirations, and ideas. The factors that may affect commuting to the University could be price, environmental effect, social status, social norms, habits etc. One person could see taking a bus as a cheap, environmentally friendly action, where they could read their homework. Others could view taking the bus as negative due to the fact it takes longer than a car, is crowded and too expensive (Shove, Pantzar and Watson, 2012, p. 14 & 53-56).

- **Competence**-This encompasses skills and knowledge, which are needed in order to perform a certain practise. For example a trip to the University can depend on car driving or bike riding skills, or a knowledge of bus routes. For example, if a person wants to take a car then they need to have certain skills to do so, and if they wish to take the bus then they need to have knowledge of where to get on the bus, where to get off of it, and how to purchases a ticket for it (Shove, Pantzar and Watson, 2012, p. 14 & 48-53).

The components are integrated together by the individuals who carry out the practise. The individual is a blank canvas wherein meaning and competence are brought together and evolve. The material is adapted to the practise which renders the composition of the components complete (Shove, Pantzar and Watson, 2012, p. 21 ; Holtz, 2004).

In order for a practise to be successful a level of coherence between the components involved must be present (Holtz, 2004). In order for a practise to work, an individual must have a certain amount of knowledge and skill of how to enact that specific practise. Coherence is related to cognitive consistency. If an individual routinely performs a social practise and the individual does not change how it is done or reflect on why it is done, it shows that the person is not experiencing a high level of cognitive dissonance (Festinger and Carlsmith, 1959). This means that the person engaged in this practise does not view their actions as unpleasant nor do they think that they are doing the “wrong thing”. Cognitive dissonance becomes manifest when a person does something that is inconsistent with what they think that they actually should be doing, and the activity itself starts to become mired in unpleasant psychological tension. This will then provoke a change either in the mind set or behaviour itself of the individual (Festinger and Carlsmith, 1959). The elements that constitute a successful practise mutually exclude the elements that provoke cognitive dissonance (Holtz,2004). This means that the material element must be in harmony with meaning element.

Often people’s daily activates are not based on deliberate conscious decisions but are more or less based on habits, which an individual performs effortlessly and unconsciously. A person can only act without exerting a significant cognitive effort if they have proper knowledge and skills to do so (Holtz, 2004). This means that competence must fit together with the material element.

How well a practise is executed and the extent to which the three components fit together can be measured by the coherence of the practise. If an action has a high level of coherence then the person will have no desire to change that specific action (Holtz, 2004).

An individual's own experiences and beliefs will strongly affect how willing the individual is in engaging with a specific practise. When an individual is involved in a certain practise the amount of time they spend engaging with it leaves them with certain knowledge, a set of skills, and an accumulation of material artefacts. These aspects are what make the difference between some practises becoming increasingly widespread by individuals and some not (Holtz,2004; Shove, Pantzar and Watson, 2012).


This presented conceptual framework of social practice shows that the relevant components and processes are connected, and therefore it is a suitable starting point to investigate social practises. In order to change the behaviour of individuals at home, efficacious actions in their home environment should be encouraged through positive feedback, and some realistic alternatives should be provided. It is important not to change too much, or too quickly, otherwise the changes will outstrip competence.

4.2 Persona

Persona is a technique used to connect clients and designers with a development of a design product or service. It is a design tool that is becoming more and more recognized in the sector of user-centred design (Grudin and Pruitt, 2002;Goltz, 2014). A Persona is a fictional character that represents specific group of users. The profile of the Persona includes shared interests and behaviours that are relevant and typical of that specific target group (Goltz, 2014). A Persona will have a name, age, life goals, families, friends, hobbies, ethnicity, socioeconomic status etc. (Grudin & Pruitt, 2002). A Persona is a way of understanding people, and it is a good way to facilitate empathy and communication (Martin and Hanington, 2012 p. 132). A Persona allows data that has been collected by other means to be collected. It is a foundation for building scenarios and data collection (Grudin and Pruitt, 2002).

In user-centred design, the key is to understand people, and for the designer to consider all aspects of the design in relation to people (Martin and Hanington, 2012 p. 132). A Persona provides an insight into social and political aspects. This allows designers to also examine features that would otherwise go unnoticed. A Persona grants the possibility of seeing beyond the confines of demographics, which tell nothing about people's behaviours and views of the world (Grudin and Pruitt, 2002).

BRANDI TYLER



PROFILE Narrow Feet

GENDER Female

AGE 36

LOCATION Los Angeles, CA

OCCUPATION Receptionist; \$38k


MOTIVATIONS
Brandi gets very emotional about shopping for shoes in retail stores because she rarely can find a pair that fits her narrow feet. Recently, she's turned to online shopping to avoid the hassle of shopping in stores. Brandi found Munro after Googling "narrow width shoes" and reading other reviews online about the company.

GOALS

- Needs an SS (4A) width shoe
- Would like to purchase several pairs to fit occasion, style, and color
- Hoping to find that she doesn't have to sacrifice style or options when searching by fit

FRUSTRATIONS

- Not being able to filter available shoes by width
- Getting far fewer options when she applies width filter
- No other recommended shoes when she's looking at a pair she particularly likes



"It's SO difficult to buy shoes that fit my feet."

REAL MUNRO CUSTOMERS

"My whole life has been a choice between fit and style - when I was younger, I went for style & my feet killed me. As an adult, I tried for fit & the styles were for 95 year olds. This shoe is the 1st time I could get both."

"I wear a 4A and I have struggled my entire life finding shoes narrow enough for my feet and more so in recent years. I stumbled onto this Munro brand sandal and was shocked to find it comes in up to a 4A width and it actually fit and is like wearing a glove! I now have two pairs in different colors."

"Love these slides so much I went out and bought two more pairs. I have very narrow feet and they fit perfectly. They're very stylish and I get compliments whenever I wear them."

Figure 10 Example of a Persona (Walker 2012)

The most common way to present a Persona is via a short page-length description that gives a name, a photo and a small narrative story where all the details about the characters life situation, behaviour, and goals that are significant to the design are included. The photo can also be a sketch or a photo purchased online. This is done as a precaution to protect the real identity of the person. In addition to a photo or a Persona there can be additional images that illustrate a certain lifestyle (Martin and Hanington, 2012 p. 132). There should be a defined link between the characteristics of a Persona, and the collected data. If the Persona is not

perceived as credible, then it loses its validity and becomes unusable (Grudin and Pruitt, 2002). An example of a Persona can be seen above in figure 14.

There are several benefits to using Personas. A Persona can be used to focus a product design towards a specific target audience, and it helps to ascertain whom the product is being designed for. A Persona does not represent every plausible user, so it is important to focus on different kinds of users. Personas are a method of communication and help people to memorize facts, draw attention to specific details, and help to organize detailed user data. Creating a Persona helps a researcher clarify their assumptions about the target audience. In this way, developers keep the actual user of the product/service in mind when they are making decisions and can design the product around the needs of the user. Personas have the power to centre the focus on the users (Grudin and Pruitt, 2002).

In addition to the benefits of using Personas, there are also drawbacks. It can be tempting to overuse a Persona and discard or replace other user-centred methods, ongoing types of data collection, and evaluations. In addition, different needs require different Personas. For example, marketing and product development can sometimes have a different kind of target audience. Marketing generally focuses on buyer behaviour whereas product development is centred on the end user, and often these are not the same. Therefore, it is risky to use the same persona for both (Grudin and Pruitt, 2002). In order to make a meaningful Persona, it is important to remember to move beyond demographics and photos and stay focused on the motivations and needs of the end users. In order for the Persona to be representative and realistic, it should be behaviour-centric (Goltz, 2014).

For this thesis, the use of Personas was necessary, due to the fact that a new design, which seeks the reduction of food waste might look appealing and useful to the users, but if the current users lack the right skills and knowledge to implement or understand the benefits of the design, then it serves no purpose. The Persona in this thesis was used to help develop the products that would be implemented at the Rub & Stub restaurant and at the WeFood supermarket. The use of a Persona helps the researcher to focus on a target group's needs, motivations, desires, frustrations, and challenges related to food waste.

The next section introduces the Storyboard concept that is an extension of a Persona. A storyboard can help the designer to empathise with the Persona and also encourage the

audience to relate to the Persona's story, together with their desires, needs, motivations and challenges. A storyboard helps the Persona to come “alive”. It also makes the Persona more memorable, easier to relate to, and better understood.

4.3 Storyboard

The storyboard is a series of illustrations assembled in a sequence that provides a visual narrative to a situation of interest. It is often supplemented with text, which helps to further clarify the concept. A storyboard helps to generate empathy and to communicate with an audience (Martin and Hanington, 2012 p. 170). Storyboards are beneficial tools when it is necessary to communicate initial design ideas and receive feedback from advisors and customers on a product's feasibility. Even simple storyboard can assist in finding the confusing or problematic features of a design in the early stages of the process. In addition to presenting an already existing idea, the storyboard can also assist in determining a problem area that the designer may be dealing with. It is often the case that the first design idea should be considered expendable (Vertelney, 1990).

A storyboard also helps to see how different attributes and people influence a product. By adding a visual element, it is easier for people to empathize with the end users of the product, and to see what they actually hope to get out of the product. This method allows the researcher to consider other design alternatives early in the design process (Martin and Hanington, 2012 p. 170).

The illustrations for a storyboard should have a certain degree of realism. Pictures, however, do not have to be left to the professionals, and often a simple stick figure drawing can portray a message in an effective way. A simple illustration allows the audience to focus more on the issue itself rather than getting lost in the background detail. It is important not to get stuck on little details because they can create distractions, which will negate the purpose of the Storyboard. Text can also be used in the storyboard to help communicate a concept when the use of illustrations would cause too much confusion. The text is usually kept to a minimum,

and often consists of thought balloons, captions or explanations of the background objects (Martin and Hanington, 2012 p. 170).

Depending on the goal, a Storyboard can be used to emphasize different things. The emphasis can be either on people, products or both. If the goal is to provoke an emotional reaction from the audience then the characters should display this and be shown in emotionally charged situations. If the goal is to evaluate feedback from the audience about a design, then omitting characters can give a clearer picture of the design itself and will allow the audience to focus on it alone (Martin and Hanington, 2012 p. 170). The goal can also be for designers to communicate ideas between themselves. The storyboard can be used as a medium between designers to discuss changes to the design process (Vertelney, 1990).

Usually, a Storyboard will have three to six panels. The Storyboard should focus on a relevant concept, therefore if there are more panels, than it is advisable to use multiple storyboards. This allows a better focus on communication (Martin and Hanington, 2012 p. 170). Generally, the first scenario should focus on the product that the designer is attempting to develop. The character used should be a representative of the end users of the product. The character in the Storyboard should possess a cluster of shared characteristics with the end users. The environment where the story takes place should be clear to the audience. The story should also show the things the end user will be able to accomplish by using this new product (Vertelney, 1990). An example of a Storyboard can be seen in Figure 15 below.

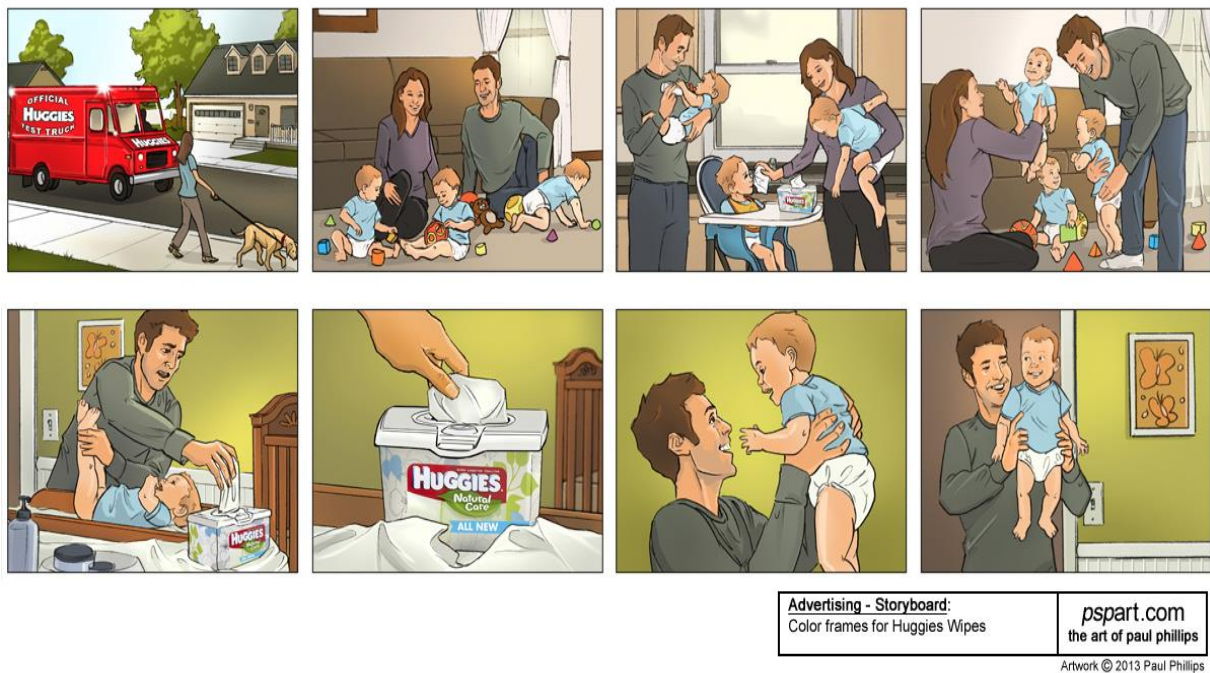


Figure 11 Storyboard (Paul Phillips 2013)

Time on a Storyboard can be communicated by showing a clock, calendars, the movement of sun etc. What to display on the Storyboard will vary depending of the target group. This means if the target audience is a group of visual designers it is important to incorporate many details, or if the target group is the end user, then the panels should display emotional scenes that will trigger empathy. This will verify whether the situation created is realistic and important (Martin and Hanington, 2012 p. 170).

In this Master's thesis, the storyboard shows a representation of communication touchpoints that the target audience responded to in their home settings and at the Rub&Stub or WeFood. Example of a Storyboard can be seen on Figure 15.

4.4 Consumer Education

This section seeks to bring broader recognition to the topic of educational marketing. This part is included to demonstrate how businesses are changing their current marketing strategy, and enumerates reasons why the WeFood supermarket and the Rub &Stub restaurant would be interested in incorporating cooperative educational design solutions into their organisations.

It also attempts to convey the benefit of using these methods, instead of other more traditional alternatives, to change consumer behaviours.

Here it is helpful to include a definition of education: *“Education in its broadest sense is any act or experience that has a formative effect on the mind, character or psychical ability of an individual.”* (Hussain, 2012)

The design outcome should aspire towards convincing supporters of these food waste initiatives to generate even less food waste.

Nelson Mandela: “Education is the most powerful weapon to change the world.” (Pulizzi, 2013)

We must first change how we handle our food. Therefore, education is the key. The food waste initiatives mentioned previously in this chapter are good platforms for reaching out to a potential target audience, especially if they are already willing to do something about the matter of food waste, or are willing to learn more about that issue. An assumption of the target audience’s willingness is justified for several reasons. The WeFood supermarket does not have as good of a selection as other supermarkets nearby. It does however have cheap prices, which can be the reason for people shopping there. Or it could also be the fact that customers support it because profits go to charity. But it could also be that many of the customers want to help reduce food waste. The same is also true of the Rub & Stub. Many of the clientele in these locations might not shop there specifically because they want to generate less food waste, but they nevertheless do show an interest in this topic. The clientele seems not to have a problem in consuming/buying food that is considered surplus (about to be food waste). This means they are also willing to consume the same kinds of foods/products at home. There is great potential for educating customers at these locations, so why not try to take advantage of it.

Brands that seek to educate customers are choosing a path that has not been widely used in the past, but can have a remarkable effect on shaping our future. Generally, customers do not care about the product, or the service that a certain company offers, but they rather first and foremost care about themselves. This means that marketing strategies that empathise with customers and their needs work better than marketing strategies that are solely focused on a product. The product/ service that a business tries to promote must, to some extent, fulfil

customer's needs, or at least pique their interest so that they can emotionally connect with the brand (Pulizzi, 2013). The food waste initiatives mentioned in this Master's thesis do not directly target their customers or seek to educate them on food waste. The people visiting these places might do so, not just to make use of their services or because of the goods provided, but they might also be interested in fighting the war against food waste. Showing people that the organization also cares about how their customers deal with food waste can help portray the business as being emotionally involved, and caring about the wellbeing of their customers and their surroundings. This feeling can engage the customer even more and bring them closer to the organization.

Many commercial brands also use customer education. In a way, it is motivated by the intention to attract more consumers, and the desire to make sure that the business will be the customers' first choice if they are in need of the product or service. This is also done in order to gain loyalty and the attention of the customers (Pulizzi, 2013). The psychology behind a consumer purchasing or using one type of service over another is complex and very dynamic. One thing that seems to make this more effective is to integrate additional usable educational information together with the product/service. This usually attracts consumers because they feel as if they getting something more out of the business than just the product or service that they pay for (Ostroff, 2016).

Here are a few examples of companies that are successfully assimilating this educational marketing strategy. First, the Whole Foods Market (United States & United Kingdom) does not just sell organic food, they also educate their clientele and offer recipes, tips for keeping the family healthy, and introduce new local vendors. This is mainly done via a community blog. Often, they will have posters in their stores that educate their customers on seafood, or for example the different tastes that mushrooms can have (Ostroff, 2016).

Roberts & Durkee Law Firm (United States), improved their customers' lives by educating them on how to do their jobs better. This was done by assisting thousands of Florida homeowners, whose homes were built with toxic drywall from China. They created websites and blogs to help consumers cope with the problem and find a collective solution. This act resulted in new business opportunities and a loyal base of new and old customers (Pulizzi, 2013).

Intuit (United States) is a software company that develops financial and tax preparation software, and offers other related services to small businesses and individuals. They created a webpage called Mint.com. It also comes in a form of a mobile app and educates its users on how to manage their money by providing charts, graphs and other helpful tools. By these means, users can gain financial knowledge and understand where their money is going. If a consumer is in need of a paid accounting software, Intuit will be the first to come to mind (Ostroff, 2016).

Lauren Luke (England) began to sell her make up products on eBay. In order to reach out to her customers, she did not just stick to selling her products online, she also started offering tutorials for her customers, and new potential customers, on how to apply the make-up that she was selling. After five years the demand was so great, she started her own make-up line. She spent no money on traditional advertising and on YouTube she is more popular than some well recognized brands, such as Estee Lauder (Pulizzi, 2013).

Education of consumers can be time-consuming. While most of the material that can be used to share valuable educational content concerning food waste is free on the internet or can be found in public libraries, someone needs to spend their time, either writing, or collecting this material (Ostroff, 2016). The author believes that it is possible for food waste initiatives to engage some volunteer staff to administer the new educational design solutions. This is also based on the fact that the author volunteers in one of the food waste initiative organizations. It would be best to have small goals in mind at first and build on these. All relationships begin with small interactions. By building relationships, customers and staff can raise awareness of the new vision to supplement the experience with education. This would also make the organizations more memorable for the customers. The author will guarantee that the new design solutions for the food waste initiatives will not be forced upon the customers. If they do not wish to take part in it, they can choose to not get involved. This way it can be ensured that customers will not be potentially driven away by new changes in case they are not comfortable with them, or do not desire to be educated or influenced in any manner.

5 PROCESSING OF THE FINDINGS

The findings from the literature study are presented in the “State of the Art” section, and are re-examined in the “Analysis & Results” chapter. The netnographic findings in the “Methodology” chapter are examined in the “Idea Development Phase” chapter. The processing of the findings from the touchstone tours from the two case studies: the Rub & Stub and WeFood market, together with the semi-structured interviews are explained in the following sections.

5.1 Processing of the touchstone tours

This section presents an analysis of the material gathered during touchstone tours. It gives an overview of how the observations were conducted and how they have contributed to knowledge production. Fieldwork and observations allow the researcher to place themselves among the others of a community that is being studied. The material gathered during the fieldwork becomes a reflecting tool while the researcher is engaged in the fieldwork and when it is finished (Koch and Vallgård, 2008 p. 91).

The two organizations under study were visited multiple times each in order to ensure that all the details would be captured sufficiently. The WeFood supermarket was visited three times as was the Rub & Stub restaurant. During the touchstone tours, the material gathered varied in structure and type. Notes were taken of observational experiences, and of conversations with the staff. Photos were taken and stored in files, as were the hand-drawn sketches showing the physical attributes of the locations. All these were structuralized by thematising the content. The themes were categorized into two categories. The first category contained the attributes that were acceptable to the researcher and the management. The second category reflected things that seemed to be in need of improvement. This method of categorizing the gathered material showed the possible areas where new design solutions could be implemented. The thematising also helped the researcher to understand the many structural layers of the organizations. It also clarified the management system and how customers in the environment act and feel.

The photos revealed hidden qualities of the places and allowed the researcher to mentally return to the places. The photos were also used to make the mood boards. The sketches were

later used to draw up floor plans. This was done using an online floor planner program called: smallblueprinter. The floor plans helped to visualise the physical layout of the locations and as well to envision a new design solution.

The notes from customer observation at the case locations were used in the “Idea Development Phase” chapter to ensure that the new design solution would be something that the customers could realistically implement while still enjoying the offerings of these locations. An additional imperative was that the new design solutions should not interfere with the customers and the staff. This means that people would still be able to enjoy their meal at the restaurant and shop at the supermarket without too much disturbance. The notes also recorded how customers themselves experience these locations. The overall intent was to make sure that the new design solutions would be something that the customers would like.

After the material was gathered, the findings were analysed. The findings are presented in the “Introduction to the Cases” chapter, where the mood boards and the floor plans are presented but as well in “Idea Development chapter”, where based on these observations together with the findings from the literature and the semi-structured interviews new design solutions are created.

5.2 Processing of the semi-structured interviews

This section clarifies the analysis of the collected data from the semi-structured interviews. It explains the theoretical methodology used to code the interviews and a general explanation of the analysis in general.

The four semi-structured interviews were recorded with a mobile phone, so that the interviewer could focus on the topic and the dynamics of the interview situation (Kvale, 2007, p. 93). The phone recordings were of high quality and were transferred to a computer for transcription shortly after the interview took place. A trial version of Express Scribe Transcription Software Pro was used to transcribe the interviews. This program allowed the researcher to listen to the audio at a slower speed and to easily navigate back and forth. The author herself transcribed the interviews in order to confirm the details and to process the meaning of what was said during the transcription process (Kvale, 2007, p. 93-94). The sample of interview transcription can be seen in Appendix 3.

The transcribed interviews excluded the pauses and expressions like: “ooh”, “mh “sigh” etc. unless it added some deeper meaning. Laughter was included and stated in brackets (Kvale, 2007, p. 95). The interviewees were given pseudonyms in order to protect their identity. This was done at the behest of participants in order to remain anonymous. The transcription process gave deeper insights to food waste practises and everyday habits related to food, by focusing on the specific words that the collaborators used which they expressed themselves (Kvale, 2007, p. 105).

The interviews were read through two times after transcription process. The first time in order to gain an overview of the interviewees, and the second time to deduce the themes and characteristics of the spoken phrases. The interview analyses focused on the meaning of the interview and rather than the meaning of the language used in the interview (Kvale 2007, p. 104). Also when reading the transcriptions the researcher made additional notes. These notes were called memos and assisted the researcher in understanding what the interviewees were trying to convey. These memos also included impressions of the interviews. In addition little summaries were written down of the contents of each interview. This helps to later on compare interviews and see quickly the key points of what has been said (Rubin and Rubin 2012, p. 191-192).

The interviews were coded manually by using different colours to highlight the various natural meaning units, which were compiled from the interviews and determined by the researcher (Kvale 2007, p. 107). The colours and themes can be seen in Figure 10. The themes comprising the natural meaning units were: “Shopping practises”, “Cooking routines”, “Leftovers”, “Packaging”, “Views on expiration dates and food that has lost commercial appeal”, “Composting” and “Garbage/waste”.

The themes in the “State of the Art” chapter were drawn from existing literature, which enumerated some of the causes of household food waste, and from the interviews themselves. For example, the themes: “Willingness to change current habits” and “Views on food waste” were influenced by the interviews.

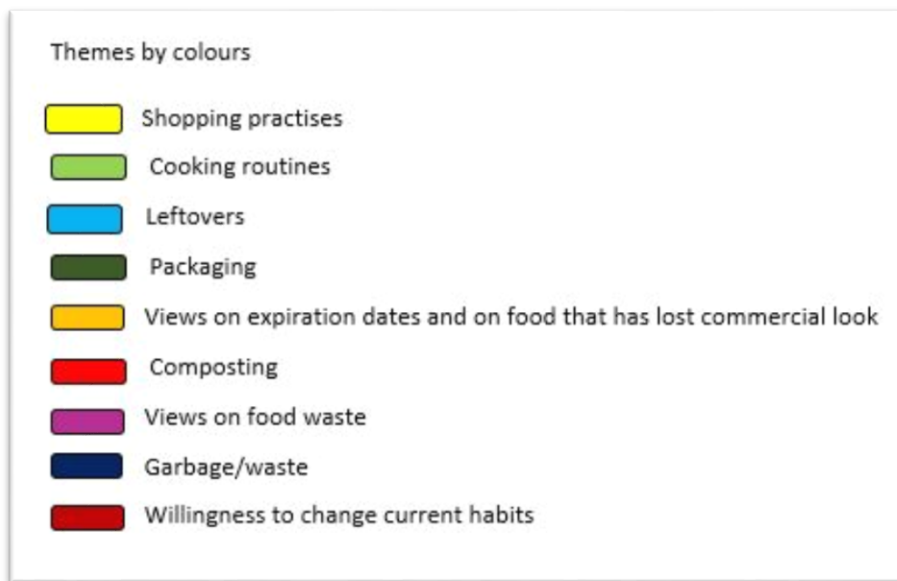


Figure 12 Interview themes by colours

The themes for coding were developed and evolved in the initial stages of the interviews. After working through the first two interviews, the themes were finalized. The themes were chosen based on the fact that they kept resurfacing, which meant that data production had reached a point of saturation. The coding helped ascribe meaning to the text, organize it into categories, and check how often the themes occurred. (Kvale, 2007 p. 105-107; Rubin and Rubin, 2012, p. 199-200). The Figure 11 below shows an example of the interview that has been coded.

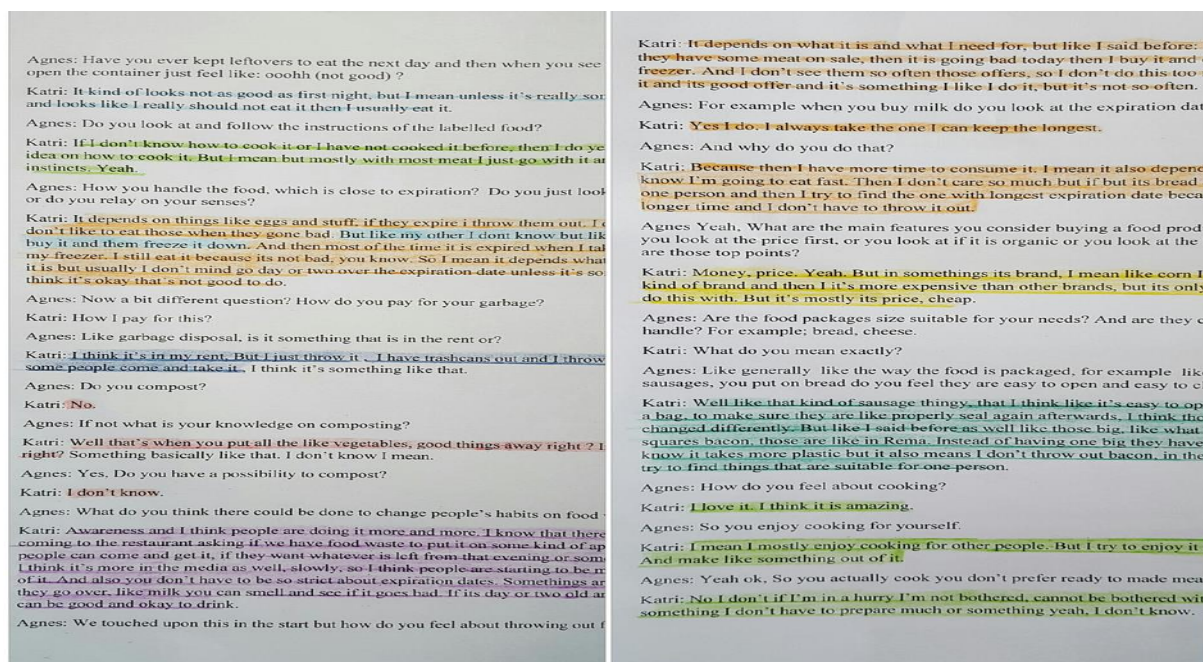


Figure 13 Sample of Interview coding

[illegible]

67

This was done by processing each interview participant individually, in order to minimize confusion, or possible mistakes. After placing the cut out phrases by the interviewees under their designated categories the long statements were compressed into brief statements. By doing this the researcher was able to make sense of what has been actually said and understand what the interviewee meant. In addition, this process made the data more compressed and more accessible. This method allows for the extensive analysis of complex interview texts (Kvale, 2007, p. 106). If the condensing of a long sentence into a brief statement created a paradigm that would allow it to be placed in a separate theme then it was done. In Figure 13, the distilling of long sentences into to smaller statements is shown in order to demonstrate the way in which the researcher made sense of the meaning of the interview text.

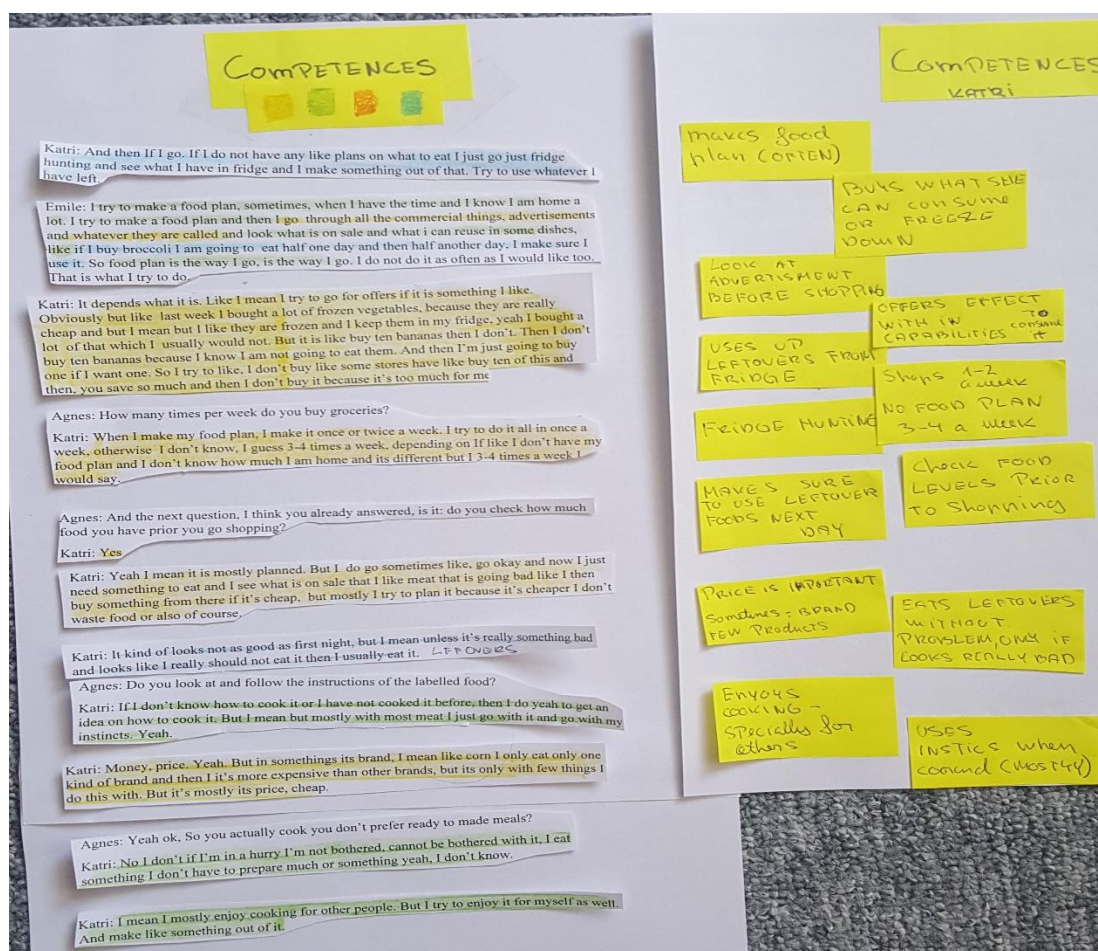


Figure 15 compressing the interview findings

6 ANALYSIS AND RESULTS

This chapter presents the analysis and results of the research. Empirical data conducted via interviews will be analysed by applying the theory of social practice. A Persona and a storyboard based on the data gathered were developed and will be presented.

6.1 Social practice theory

The section is structured according to the theoretical framework of the three elements of the social practise theory: materials, meanings and competence. Because the elements are intertwined and interconnected just as food waste is, the sections will cross-reference other elements. This is an analytical method of trying to understand the reasons and the motivations behind household food waste from the consumers' perspective.

Before analysing the statements of the interviewees, an overview of the interview participants would be beneficial. Below is a table with brief information of all the interview participants whose statements form the base of the analysis.

Table 2 Overview of Interview participants

Katri 27	Sara 43	Peter 33	Maria 26
Lives alone in the city centre. She is conscientious of what she buys and how she buys it. She is careful about how much she spends on food. When it is possible she plans her meals and likes to cook. The price of food is important for her.	Lives in the suburbs of Copenhagen together with her family. She has four children between ages 5-18 and a husband. She is confident in the kitchen and likes to be spontaneous when cooking.	Lives alone in the city centre. Likes to go shopping daily. He enjoys stability and cares for the environment. He does not enjoy cooking. He prefers organic food.	Lives in an apartment in the city together with her child and partner. She likes to go to a store and try out different things. She enjoys cooking and is confident in the kitchen. She likes a variety of foods. She does not usually plan her meals.

Based on the data from the interviews and the social practise theory, it is possible to investigate and analyse how consumers view their own food waste practises. The analysis will be divided into three parts based off of the three elements of social practise theory: material, meaning and competences.

6.1.1 Material

As previously mentioned the material element consists of all physical aspects that cover the performance of a practise. This also includes the human body itself (Shove, Pantzar & Watson 2012). This section presents and analyses the material aspects that influence the behaviours related to food waste. The material element will touch upon the themes of: “Garbage/waste”, “Packaging”, and “Composting”. And since it is interconnected, the theme of “Shopping practises” will also be discussed.

All the participants lived an active lifestyle and were not limited in any physical capacity. This means that when it came to purchasing, cooking and storing the food they faced no handicaps.

Before the actual interview, all the participants were asked whether they have: a microwave, an oven with burners, and a fridge with a freezer in their kitchen. All four participants had these items in their kitchen. It was an important question to ask, as it was necessary to see whether these individuals were limited in their abilities to prevent food waste by a lack of necessary kitchen equipment. For example, a fridge and freezer are necessary for properly storing many food items. The freezer is also good for storing food over an extended period of time. The downside of a big freezer is that it often encourages people to fill it up with food that will unfortunately never be eaten. A study conducted in 27 EU countries concluded that the most effective method of not wasting food was the use of a freezer as it allows food to be conserved for a longer period of time (Secondi, Principato and Laureti, 2015). The use of a microwave gives a quick and easy way to heat leftovers or to cook ready-to-eat meals. The question as to the possession of a stove and oven was included in the query as well, since it determined whether it is possible for the interviewees to cook meals at home or to reheat leftovers.

Food waste constitutes about 1/3 of the content of a home garbage bin, but in many cases that proportion can be even higher (Stopfoodwaste.ie, 2016). By composting at home, it is possible to save landfill space and conserve fuel that is needed to move the garbage around to the overall benefit of the environment. Compost that is made at home is full of nutrients that improve the soil's fertility, moisture, texture, structure and overall nutrient capacity (Stopfoodwaste.ie, 2016). Composting and recycling takes time. Over the course of this process people can become more aware of how much food they actually waste, which will lead them to reduce their food waste (Secondi, Principato and Laureti, 2015). When asked from the interview participants nobody was currently composting. Three of the participants either did not have any knowledge of composting or said that they lived in city and they did not have the possibility to do so. Two participants however did mention that their parents/grandparents used to compost or are still doing it:

"I was brought up with the composting bucket, with worms. Because in Jylland they, a lot of municipalities offer them. . . My parents have doing it entire their life. . . I am annoyed that you don't do it in Copenhagen you have to figure it out yourself" (Sara, 43)

"So they use to do it like all the time, it was normal for them. Even since my dad was the child."

(Maria, 26)

Based on this information it is evident that composting seems to be commonly practiced more in areas further from the Copenhagen metropolitan area, and it seems that it was more common in the past. Peter confirms this by stating that he used to do composting when he lived in the countryside in Midtjylland (Central Denmark Region).

"I lived in the country. I did compost" (Peter, 33)

Garbage service is something that each municipality organizes on their own. Peter and Katri who both live in city centre in apartments, gave very short answers when asked: How do you

pay for your garbage? They viewed the garbage service as something that was included in the rent, and did not elaborate much on the topic. Katri simply added:

"I think it's in my rent, but I just throw it, I have trashcans out and I throw it out and some people come and take it" (Katri, 27)

The two other participants who lived in a house, or have lived in a house, had slightly different views on garbage disposal and elaborated more on the topic. Sara who lives in a private house near Copenhagen mentioned that in addition to the usual trash that is taken they also have an extra truck coming every two weeks that takes care of the glass, bottles plastic etc. In addition, Sarah's family also has a garden waste bucket, which is used to collect as much there is a need for it. All of these cost extra, which means the more waste you generate the more you have to pay. One can assume that paying extra would compel the consumer to think more about the amount they throw out. This assumption is supported by the results of a survey conducted in 27 different EU countries showing that respondents agreed that being charged for waste according to quantity would result in them producing smaller amounts of waste (Secondi, Principato and Laureti, 2015). This survey result is substantiated by Maria, who used to live in her own house, but now lives in an apartment building. When she lived in the house, she thought a lot more about garbage and how much she generated, because she had to pay according to weight. Thus, the requirement of paying for garbage can lead to either a minimization of food waste, or an attempt to find other useful alternatives of what to do with waste.

"I use to pay per kilo. I had my own personal trashcan. That was picked up. Back then, I thought a lot more about it. It was expensive. So you would try to think of ways to get rid of. It used to be to feed the animals" (Maria, 26)

In line of inquiry related to waste, the participants were asked on how much food they actually throw out and if they could state the amount in kilos. This was a difficult answer, mostly

because none of them had ever thought about it, let alone attempted to equate it to an actual amount. From the study presented previously in this thesis it can be concluded that it is very challenging for consumers to estimate how much food waste they actually produce. This is because food waste is often thrown out with other waste (Graham-Rowe, Jessop and Sparks, 2014). Sara estimated that she throws out at least a few kilos a week, as did Maria. The single households of Katri and Peter thought they generate slightly less waste, but still within the range of a few kilos. It is important to add that it was very difficult for the participants to answer accurately. However, the participants were able to describe what they think they throw out the most.

"Leftovers, from dinner" (Peter, 33)

"Half of kilo meat and kilo of vegetables and cooked food. ...It is mostly vegetables because they go bad." (Maria, 26)

"We throw out lot of bread... So I think what I throw out are fruits, that get too old and it is bread .. Because I really don't throw that many leftovers out" (Sara, 43)

Based on the answers it can be concluded that leftovers constitute a big portion of food waste, together with bread and fruit and vegetables. In Denmark, it is considered culturally unacceptable to throw out unopened packages of food, although discarding uneaten food from a plate is perceived as socially acceptable. Most Danish dishes are centred around meat, therefore food items with lower status like bread and vegetables are perceived as being more disposable and it is culturally more acceptable to throw them out (Halloran et al. 2014).

The ubiquity of grocery stores affects food waste (Gjerris & Gaiani 2013). Participants were asked how far they are from a major grocery store, whether it is easily accessible, and how do they get to the location. It should be kept in mind that easily accessible can mean very different things for different people. This is why it was necessary to clarify the question by asking how far the respondent is from a major grocery store, and asking what means of transport do they use to access the store.

"My primary is 3 kilometres away and then my tiny local brugsen is 800 meters away. But they don't, there is not big variation.... Agnes: Is it easy for you to get to the one, the one 3 km away?...Sara: No, I always have to been in a car. Because we also are such a big family, I cannot have it on the bike" (Sara, 43)

"300 meters I guess. Yes it's kind of easy to get there, I have to walk though" (Peter, 33)

"..about 800 meters. Easy to get there, yeah" (Emilie, 27)

"If I walk its, few minutes. 2 minutes. But it is kind of a small store, so if I want to go where they have more specialized food I go to a bigger store, which is five minutes away."

(Maria, 26)

Access to a grocery store does not seem to be an issue for the participants. This is because they all live in the Copenhagen metropolitan area, which is very well provided with all sorts of supermarkets. Only Sara who lives outside the Copenhagen city has to take a car to go shopping, the rest of the interview participants can walk. The ease of accessibility of grocery stores in Denmark is due to the high number of stores. This allows consumers to visit them more frequently and to buy less each time (Gjerri and Gaiani, 2013). But this also means, as was pointed out in the State of the Art section, the consumers will purchase more than they need, which thereby results in increased amounts of food waste. When participants were asked how many times they go to the grocery store it is evident from the answers that the more accessible the store is the more often a person will visit it. This of course can be affected by many other factors such as: shopping habits, daily needs etc. Here the respondents answer how many times they go shopping for food.

"Two, three times, without whatever I forgot to buy" (Sara, 43)

"Every day. Almost, like I would say five times a week" (Maria, 26)

"I buy every day" (Peter, 33)

"When I make my food plan, I make it once or twice a week... otherwise I don't know, I guess 3-4 times a week." (Katri, 27)

From the answers it is apparent that making a food plan means that the consumer shops less. In Denmark, nearly half of the population visits the grocery store more than four times a week (Gjerris and Gaiani, 2013).

Food packaging is an important factor that contributes to food waste. The actual package volume, and how easy it is to handle, especially how easy it is to close it again after use, plays a huge role in the total volume of food waste (Quested et al. 2013). All interview participants expressed their concern with food packaging. Approximately 60% of Danish consumers would prefer smaller packaging, especially for meat, vegetables and sandwich food (Halloran et al. 2014). Two major issues that emerged from the interviews were that food packages are too big, and the actual amount of packaging (usually plastic) that food products have is excessive. Studies on household food waste have shown that economy sized packaging is often too big, especially for single households, and therefore often results in food waste (Halloran et al. 2014). The participants expressed the desire for smaller packaging.

"I would like smaller packaging." (Maria, 26)

"Bread is too big for me and my bread consumption." (Peter, 33)

"Reasons why I shop at Rema 1000 because they have like small packages of bread for single people like me. Some of them bacon is put into two half's, small boxes, so it is easier when you are one person." (Katri, 27)

Katri expressed the view that most packing is too big, but had found a shop that was more suited her needs. Besides the packing sizes there is also the issue of how the food products are packed.

"Yesterday I bought tatar meat and it's in the same size as like the 400g of meat but its only like 50g in it. ..., I did not have time to take it out and put it in a bag and then freezer, because there is a lot of plastic, taking a lot of space in my freezer" (Sara, 43)

“I just think that insane amount of packaging... Ten things before you get to have some like juices and there, the big block they wrapped in plastic and then the straw is also in plastic and it is glued on and it is big, and there is paper around it as well “

(Maira, 26)

From the answers it is evident that the interviewees feel that the amount of plastic used to package the food is excessive, and they do not understand why it has to be like this. In addition to the wrapping there is also the problem of how to re-close the food packaging once it has been opened.

“Well like that kind of sausage thingy, that I think like it’s easy to open but I put them in a bag, to make sure they are like properly sealed again afterwards, I think those could be changed differently“ (Katri, 27)

“Yes, I hate it when you like buy the cheap ham. I tried to open it, but you have to do it with mouth, and your teeth in you get that disgusting smell... But something are very bad, like have this like Chinese sauces that I can’t open then without knife or I will break my nails. Sometimes milk like they have these that cheap opens you break them and you cannot really open them properly“

(Maria, 26)

Packaging can create several problematic issues for the consumer. Often food products spoil quicker if they are not properly sealed after use. With the right education on how to store different food items, combined with a knowledge of the right container materials such as sealed plastic bags etc. a great deal of food that otherwise might go to waste could be reused. There is a need for smarter and easier design solutions for packaging that would keep the food fresher longer period of time (Halloran et al., 2014).

6.1.2 Competence

The competence element encompasses skills and knowledge, which are needed in order to perform a certain practise (Shove, Pantzar and Watson, 2012). Competence includes themes like: “Shopping practises”, “Leftovers”, “Cooking routines” and “Views on expiration dates and food that has lost in commercial look”.

Cooking skills affect the confidence that consumers have in their abilities to deal with food related tasks (Stancu, Haugaard and Lähteenmäki, 2015). Peter was the only interview participant who did not like to cook, and who thought that he did not have good cooking skills. Research shows that cooking skills have a direct effect on how confident a person feels about dealing with leftovers, reuse routines, and meal planning (Stancu, Haugaard and Lähteenmäki, 2015). Leftover reuse is important factor in food waste, because it is often leftovers than constitute the greatest portion of household food waste. A study made in the EU countries ranked the leftover reuse ability as third in importance when listing the most important factors to reducing household food waste (Secondi, Principato and Laureti, 2015). Peter has no confidence in his cooking skills, so his answers about how he deals with leftover food reflect this. He mentions that if he cooks something and has leftovers, he simply leaves it on the stove for days either to consume later on, or to throw out. He stated that he has some knowledge of how to deal with leftovers and other food items, but regardless never puts this knowledge into practice.

“Sometimes I leave my food on the stove for three days” (Peter, 33)

Sara always stores her leftovers in the fridge or the freezer depending what it is and when she will need it next. She says that often she gives her leftovers to her rabbits who eat bread, vegetables and fruit. The leftovers are also used for the kid’s lunches, or once a week they have a day where they consume all the leftovers they can find in the fridge for dinner. Sara feels confident in storing different food items; however, she does wonder about some aspects of how to store things. For example, where is the best spot in the fridge to store meat or milk?

"I just read that when people put milk in the door, it is the worse place to put it because that is the place it gets most exposure to heat, when you open it" (Sara, 44)

Katri is confident in how to store different food items and how to deal with leftovers. Whenever she is in doubt as to whether a food item should be left outside or inside the fridge, she always puts it in the fridge just to be sure. Maria also knows how to store different food items, and knows how to reuse leftovers. She says that she either packs her leftovers to eat for lunch the next day if it is suitable, or just consumes it later on. She did mention that if the amount of the leftover food is not enough to make a proper meal she simply throws it out.

"...then I have easy lunch next day when I go to school or I mean sometimes. Sometimes I end up throwing it out. And I can't give you a good reason why I just don't eat it sometimes, and I don't know why....But usually I keep most of in my fridge, I prefer them to be colder than be outside in the heat. And I'm thinking colds better than too warm" (Katri, 27)

"I bring leftover to work. Because I do not plan my lunch, I just bring whatever is there" (Maria, 26)

People who have the skills to cook the right amount of food do not need to store the leftovers and therefore the probability that leftovers will be forgotten in the fridge will be minimized (Quested et al. 2013). Therefore, it is important for people to know how to measure their portion size. The interview participants were also asked about portion sizes. Maria does not measure her portion sizes and often cooks too much in order to make sure she has something to eat later and will have something left for lunch for the next day. She tends to cook too much rather than too little. Peter visually measures his portion sizes and bases it on how hungry he is, because he only cooks one portion at the time. Sara says that measuring portion sizes comes naturally to her because she has been cooking for so many people for so many years; she does however say that if she had to cook for only two people it would be difficult for her. Katri always tries to make more food, so at one time she makes food for two dinners and leftovers.

“..like today I cook, and there is probably enough to save for half of lunch. So it is not really enough for you to, save it. I cannot bother wrapping it” (Maria, 26)

Planning meals contributes to reducing food waste as it decreases the likelihood of purchasing too much food (Stancu, Haugaard and Lähteenmäki, 2015; Quested et al., 2013). Peter does not plan his meals. Sara enjoys being spontaneous. She says she is very good at cooking and can prepare a meal simply by looking at the fridge and seeing what is there. She thinks planning your meal ahead of time can be quite boring. Emilie often plans her meals and she likes to make food plans to save time and money. Maria never plans her meals ahead of time.

“No, closest I get if I plant to have a pizza on Sunday” (Maria, 26)

The interview participants were asked if they check their food levels prior to shopping. Peter and Maria rarely do so. Katri and Sara however do it frequently, but Sara’s husband does not. This, she says, is one of the reasons they waste a lot of food. People tend not to plan their shopping as often as they should. Around 75% of the total purchases in Nordic countries are decided after entering the store (Gjerris and Gaiani, 2013). This figure was also representative of the interview participants because when they were asked if they make a shopping list prior to shopping, only Katri stated that she did.

Interview participants were asked what they base their decisions on (price, taste, brand etc.) when buying food. In addition, they were asked whether the offers of the weekly brochures from the grocery stores effect their shopping. In Denmark, more than 90% of consumers read the weekly brochures distributed by the grocery stores in order to get ideas on what to shop for and where to shop. A survey conducted of Danish consumers showed that people are interested in high quality products and in a large variety, when they go shopping. This even applies to standard products such as milk (Gjerris and Gaiani, 2013). The interview participants valued taste and quality when considering what food product to buy. For half of the interview participants it was also important that the food be organic. Peter had no use for the weekly brochures, unless he sees something very expensive that is on sale. Katri however uses them

to spot good deals that would save her money. If she knows she cannot consume the food product in time, however, she will not buy it.

"I don't buy ten bananas because I know I am not going to eat them... I'm just going to buy one if I want one"
(Katri, 27)

All of the interview participants were asked what precautions they take to limit their own food waste. Peter said that since he cooks every day, and goes to the grocery store every day he does not do much, but he does try not to buy too much and attempts to use whatever he purchase on the day. Emilie makes a food plan as often she can. When she makes the food plan and the shopping list she also makes sure that all the food items will be used. Sara tries to make a food plan, but as was mentioned before, she likes to be spontaneous and it does not always work out. Maria often freezes the things she has bought or cooked herself.

"I try to make a food plan and then I go through all the commercial things, advertisements and whatever they are called and look what is on sale and what I can reuse in some dishes, like if I buy broccoli I am going to eat half one day and then half another day, I make sure I use it " (Katri, 26)

"I freeze stuff, when I buy big things, I divide them into portions....Or if I cook meat sauce or something, like big portion then I freeze also the finished meat" (Maria, 26)

Overall, from the interviews, it is apparent that the people who try to plan their meals ahead of time find it easier to consume all of the food products they have purchased, and end up generating less food waste.

6.1.3 Meaning

Meaning includes symbolic meaning, aspirations and ideas (Shove, Pantzar and Watson, 2012). Meaning will explore: the willingness to change current habits", "Views on food waste".

In addition, the theme “Views on expiration dates and food that has lost its commercial value” was also added to the element “Meanings” because it also touches on some of these aspects.

The first interview question was: *“What does food waste mean to you?”*. This was asked in order to understand how the interview participants view food waste. This also allowed the researcher to confirm whether they have the right idea of what constitutes food waste. Based on research of consumers, saving money is one of the biggest motivating factors in reducing food waste (Quested et al., 2013). Therefore, it is not surprising that two participants associated food waste directly with money.

“I mean its money that I am throwing out basically” (Katri, 27)

“I mean you always feel bad for wasting it, but it little bit as well someone else could have eaten it but mostly money for me.” (Maria, 26)

Katri expressed the view that food waste is unnecessary, and that she should save and consume food instead of letting it go to waste. Maria feels guilty when she discards food that somebody else could have eaten. Peter thinks people cook too much because food is cheap and accessible. He is not far off the mark because for most citizens food in Denmark is abundant, cheap and available everywhere at any time (Gjerris and Gaiani, 2013). These research findings together with Peter’s observations on food waste lead to the conclusion that participants also viewed food waste as something that can be avoided by instituting the right measures. Sara gave a more in depth answer to what food waste means to her but this is also because her studies have touched upon the theme of food waste. She does however acknowledge her own part in generating household food waste:

“...the kids like open five different five types of sausages or liver patty or whatever. Then it grows old and I have to throw it out because they demand great variations. Who thought them that? I did!” (Sara, 43)

All participants seemed to understand what food waste is and acknowledge their part in generating food waste at home. The participants were asked how they personally feel about wasting food.

"I do not like it actually. Makes me feel guilty." (Peter, 33)

"I don't I mean I try not to, and I don't like it. But something I think it's necessary."

(Katri, 27)

I do not like it. Because of the money, it cost me money and then I have to take out the trash. It is just mostly annoying to me. In addition, expensive because I have to buy new things... I do think it is a shame but not so much." (Maria, 26)

"I hate it. I sometimes ask myself: When is the point where food becomes garbage. When its on your plate during dinner it is food and then suddenly it turns into garbage. And then you do not want to eat it. Soon as you take the plate from the table to the kitchen where the garbage bin is, you do not eat it anymore, its iuu and you want to throw it out. And I been trying to figure out what is happening in my head. And in everybody's head. I do not know."

(Sara, 43)

None of the interview participants was okay with throwing out food as it creates feelings of guilt. Guilt is an agent that helps prevent food waste and directly discourages individuals from wasting food. The degree of guilt a person feels when throwing out food will determine whether an individual will modify their actions in generating less food waste (Stefan et al., 2013).

Sara has made an interesting point with her rhetorical question of when the food becomes garbage. This can vary from person to person. Some people leave their leftovers out and are happy to eat them again, whereas other people consider leftovers as garbage and would never eat them again. After the interview, Peter opened up more and said that that even though he said that he does, he has to admit that he never eats leftovers. The problem for him is the lack of knowledge on how to deal with the leftovers in the right way and also the ability to make it taste as good as it originally was. The other factor influencing his outlook is that he perceives food as a reward after a long day at work. He feels that after work, he deserves a premium food experience as he relaxes. Food plays a big role in our social interactions and it is part of

our identity (Quested et al., 2013). Therefore, it is natural for Peter to associate himself with what he eats.

Interview participants were asked how they themselves feel about purchasing food items that are close to their expiration date. In addition, they were also asked if they actually look at the expiration dates when buying food items and what was their reason for doing so. For Peter this was not an issue since he shops for groceries every day and only buys enough for one meal at a time. He says that he tries to consume whatever he buys the same day. Sara has no problem buying goods that are close to expiration date, although she does look at the expiration dates on food items. Looking at the expiration dates is important for her because she has a large family. This means that she buys food in large quantities and not all that frequently. Sara confirmed that she does often buy meat that is close to expiration date. She buys it because she knows not many people will and it would otherwise go to waste and she knows how to freeze it and use it afterwards. Her competence dealing with preserving food is evident.

"I thought if I don't buy it maybe someone else will, or will not and then they have to throw it out"..." (Sara, 44)

Both Maria and Katri use freezers to extend the life of the food product, especially food items that are close to expiration date, as Sara mentioned. Maria is fine with buying food close to expiration date if she knows she will consume the product or knows how she can extend the life of the product. This is what she often does with sausages for example. Katri feels the same and mentions how she freezes butter and meat, for example.

"I it's close to expiration date, like big pack of sausages then I took what I need and freeze the rest" (Maria, 26)

"If I go and see ooo, they have some meat on sale, then it is going bad today then I buy it and eat it or put it in a freezer" ...my butter I buy it and them freeze it down" (Katri, 27)

Many Danish consumers are confused about food labelling and often end up throwing out edible food because they are unsure of whether the product is safe to eat or not (Halloran et al., 2014). Therefore, all the participants were asked how they handle food if they know it is close to expiration date. Peter admitted that he does not rely on his senses when deciding when to throw out food, but only follows the dates on the packages. If the expiration date has passed, then he throws out the food item regardless of its condition. Sara mentions that she uses her senses since she is knowledgeable of food progression and is not afraid of getting food poisoning. After the interview with Maria, she confessed that she is afraid of getting food poisoning. She mentioned that she often throws out food because she is afraid that it might be contaminated and will result in her, or her family, getting food poisoning. However, she also mentioned that she is knowledgeable of food quality and often relies on her senses to determine whether to throw out food or not. A study made in UK revealed that many consumers throw out food simply because they are afraid of getting food poisoning, and lack confidence in food management (Graham-Rowe, Jessop and Sparks, 2014). Sara's teenage son looks at the expiration dates and throws the food out based on that, just as Peter does. This is common practise in Denmark, where a study found that half of the consumers questioned believed that the label "Best before" is tantamount to "inedible after". This results in a lot of food that could have potentially been consumed being thrown out (Halloran et al., 2014). Katri says she uses her senses and does not mind to eating food that is past its expiration date because she feels confident enough in her own judgment.

"...unfortunately my teenager thinks he can smell rotten food in all foods. So he only looks at the date...But my son only looks at the numbers, period. So he just throws everything out and it's kind of expensive, so yeah. But I try to look at it but I use my nose" (Sara, 44)

Interview participants were asked if they would be willing to change their current habits in purchasing and cooking food. All the participants were willing to change their habits but differed in their reasons why. Katri and Maria would change their habits if it would save them money. Katri also mentioned that in addition to saving money, it is all about making things easy. It is necessary to make cooking related activities easier for consumers. She speaks from her own experiences and says that when she makes a food plan she only visits grocery store

once or twice. This saves her money, time and even makes her diet healthier. Since she does not shop very often, it means that the amount of junk food that she buys impulsively is minimized. For many people, eating healthy is related to food waste reduction (Quested et al., 2013).

Maria mentioned that she would change her habits to save money but she would not compromise on the quality or the variety of the food she buys. Sara is open to change if it would save her money, benefit the environment and save her time. Peter's only concern was about the environment and says that other aspects would not induce him to change his habits.

"I would only do it for the environment. I do not actually care about money and I do not care about the time actually" (Peter, 33)

All the participants indicated that they would like to have more tips available about how they can reduce food waste. The tips should be easy and accessible.

At the end of the interview the participants were asked what they thought could be done to change people's food waste habits. Maria and Peter both thought that it is difficult for single people not to waste food because the package sizes are too big and are more suited to families. Therefore, they both thought there should be variety of packaging sizes. Katri and Sara both expressed views that there should be more awareness about food waste. Sara added that she thinks that people could be nudged in the right direction by education and not forgetting to use humour while doing so.

6.2 Persona

From the data collected, it was evident that the participants differed in their practises related to food waste. When analysing the data it could be seen that some participants are more concerned with food waste than others are and some are more confident in their food related

routines. The person who seemed to have the least confidence in cooking and planning meals and reusing the leftovers became the model for the Persona development. The points that were used to create the Persona, were:

- **Personal details**
- **Desires/Needs**
- **Frustrations/ challenges**
- **Daily activates around food**

These points were found by looking into IFS coursework (Tvedbrink, 2013). They were also developed from the theory presented about Personas in the Theoretical Framework chapter. The first step was to find a picture that would represent the Persona. This made it easier for the author to emotionally engage with the Persona. A name was created: Lone Petersen, and her personal details were established. Lone is a composite of the people who were interviewed. The decision was made to make the Persona a female, because the majority of the interview participants were female. Once the Persona's name and personality were established the people that the Persona was comprised of were analysed and all the major points were written down. After that, the other interview participants were analysed using the same methods. All the relevant points from the interviews were written down on a big piece of paper so that the construction of Lone could start.

The Persona is based on some key attributes. These are related to the competencies related to food waste and the willingness to change current habits. These key attributes were based on the data collected via interviews and on the key elements that were the most significant contributions to food waste based on the State of the Art chapter. The rating was judged based on what the author learned from analysing the interviews.

Lone was created in order to form a character that would represent the target group and help the author to focus the data. A Persona helps to provide solutions to a problem. By creating Lone, a better understanding of the motivations, desires, needs and behaviour of the interview participants is gained. More insight into Lone as a character, and as a representative of the participants, will be featured in next section via the storyboard.

Figure 16 Persona

Lone Pedersen

"I like to come home and eat whatever my heart desires, I don't like to restrict myself, and I work too hard for that!"

32 years old,

Copenhagen

Financial advisor

Single, living with daughter 4 years old

Cooks daily

Most meals consumed at home



Lone has lived in Copenhagen all her life. She lives in the Charlottenlund area with her young daughter, close to where she grew up. She owns a beautiful 2-bedroom apartment with a huge kitchen, where she loves to cook. She often cooks for her family and friends and on weekends, she enjoys visiting cocktail bars and restaurants. She has been cooking since she was little. Growing up she had four sisters who were all younger, and her mother never really liked to cook for the family. Lone buys groceries daily, and in large quantities, just as she did when she lived with her parents. She admits that she throws out a lot of food because she often does not manage to eat all the food she has bought. She does not like to eat the same food two days in a row. She would rather cook than order takeout. She says cooking is her way to relax at the end of the day. She often looks at the best before date because she is terrified her child will get food poisoning.

Desires/needs

- To save money. After all the expenses she does not have a lot of money for fun activities with her daughter
- Better organizations skills. She feels her kitchen is often one big mess

Frustrations/challenges

- Not having everything she needs in her fridge at all times
- Reluctant to change, even though she wants to save money. She would like to learn new skills but she dislikes the idea of change.

Key attributes 1-5 stars

Cooking skills



Knowledge of preserving food



Knowledge of food labelling



Willingness to change



6.3 Storyboard

A Storyboard helps to create empathy and communicate with the audience. It is a beneficial tool for communicating design ideas (Martin and Hanington, 2012, p. 170). The Storyboard was developed based on the interviews and observations made in relation to the food waste initiatives. The key findings were organized into categories and the Storyboard: “Lone goes Shopping” was created based on these results. In the beginning an initial rough outline of the story was made by hand on a piece of paper. This was later transferred to a digital format. The text bubbles show what Lone is thinking. The text box on the left corner shows where the setting is taking place.

The Storyboard allowed the researcher to see what areas Lones struggles in. In addition, it was beneficial to see if the design solution could help to reduce household food waste and if it would be acceptable to the target group. Thus, it offered more insight into how the design solution could actually be implemented.

The Storyboard shows several days in Lone’s life with an especial focus on her shopping routines. It shows her at the grocery store after long day at work. She tends to spend too much money and time at the store because she likes to be spontaneous with her purchasing and does not plan anything beforehand. However being spontaneous has precipitated feelings of guilt. She feels guilty because she knows she has bought too much and she will have to throw some of the food out. She also feels that she has spent too much time at the store.

After this crisis, she decides to try out a new store, the WeFood market. The WeFood supermarket offers a food waste quiz. She is interested because it promises her discounts. After taking the quiz and learning more about food waste from the information stand in the shop, she decides to change her shopping routines. In the end, she is rewarded for changing her shopping routines. This comes in the form of: having to spend less time shopping and not wasting money on food she already has. With the money she is saving she can now spend more time and with her daughter and take her out for fun activities.

It is best to first read the Idea Development Phase. The new design solution is incorporated into the storyboard to show the reader how a design solution can reduce household food waste.

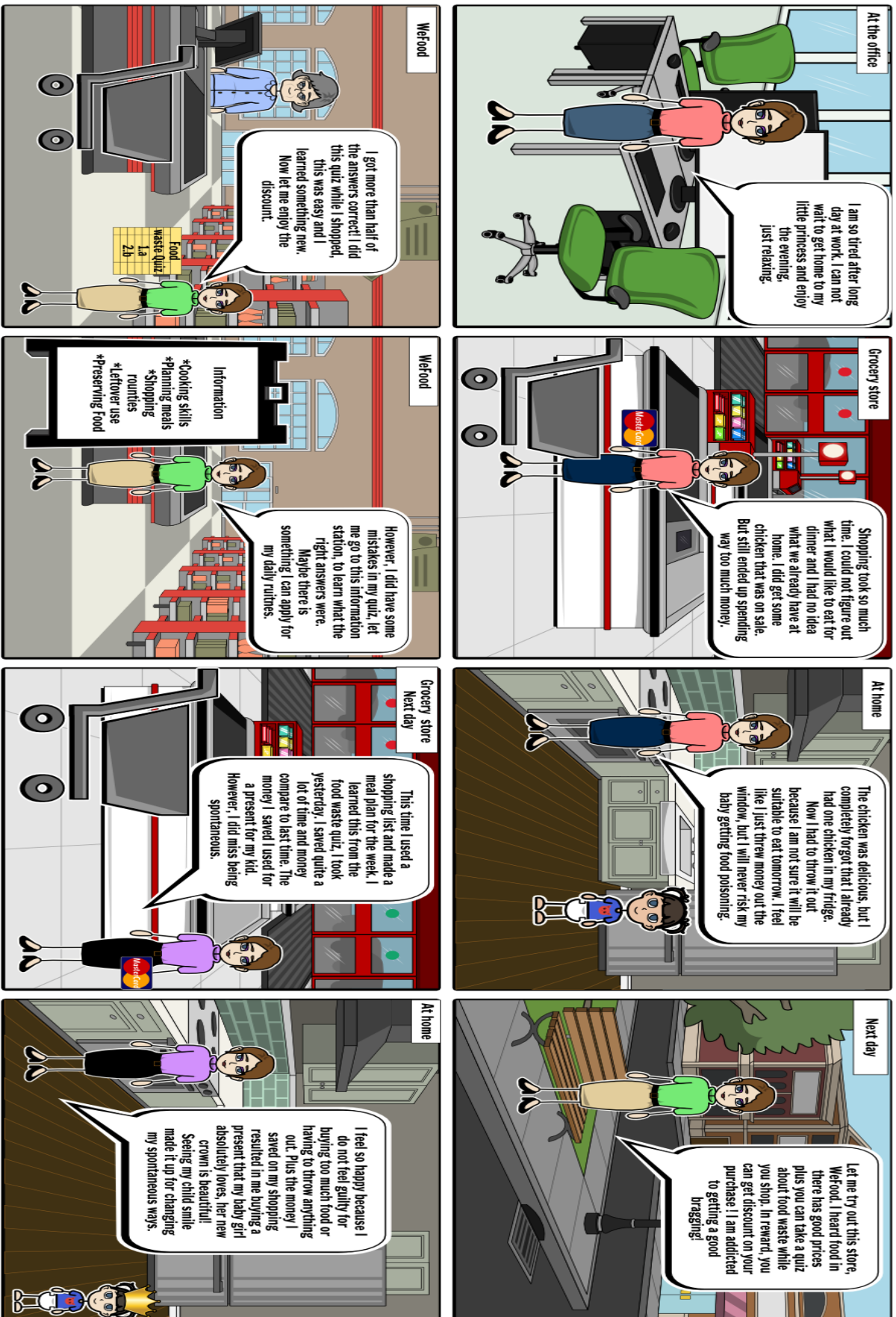


Figure 17 Lone- Storyboard

7 THE IDEA DEVELOPMENT PHASE

This section will elaborate on important elements that should be incorporated into the new educational design solution for food waste initiatives. The design solution is an attempt to reduce household food waste of consumers based on the study cases. These elements have been worked out on the basis of the data collected. Firstly, the section of idea generation process shows how the idea emerged and provides an explanation as to why certain elements have been included. The author then presents her new conceptual design solution.

7.1 The idea generation process

There were three aspects that the researcher had to consider before starting the idea development: 1) that the objective is to reduce household food waste by educational methods; 2) the collected data on the consumers' food waste habits; and 3) the fact that food waste initiatives serve as platforms for reaching the public. Those were the key aspects to be observed when design a suitable solution.

The goal of the Idea Development Phase is to create a design solution that would be suitable for both the WeFood supermarket and the Rub & Stub restaurant. The additional goal was to suggest a more alternative approach than typically seen in Denmark. The aim of this approach was to enhance the consumers' skills and change their daily routines. The idea of making a quiz for adults and children was developed because it was possible to use quizzes in both places and they were relatively cheap to implement. Likewise, quizzes offer a way of communicating with people face-to-face, and therefore they can be extremely effective in educating them. It has been argued that this type of engagement allows the new knowledge to be highly tailored to the individual (Quested et al., 2013). Making the consumers take a quiz can be difficult, but it would engage them personally much more than some other format, such as posters on the wall that they would just have to read passively. The challenge here is to reach a sufficient amount of people to make a difference in terms of the population as a

whole. At this point, nothing else was developed, but just the idea of doing some sort of an active quiz for both food waste initiatives which would include adults and children.

The data collected during the interviews, the netnographic findings and the observations from the touchstone tours were noted on an A3 format paper in order to brainstorm what aspects should be included in the new design solution. This can be seen on figure 18. In the middle, the author wrote: household food waste; this included all the important points regarding food waste that were extracted from the interviews as well as points made in the State of The Art section. On either side of the sheet, the two food waste initiatives were presented. All the attributes of these places were listed. The things that were seen as positive were highlighted green, and the red represented the negative aspects of these locations, which were based on

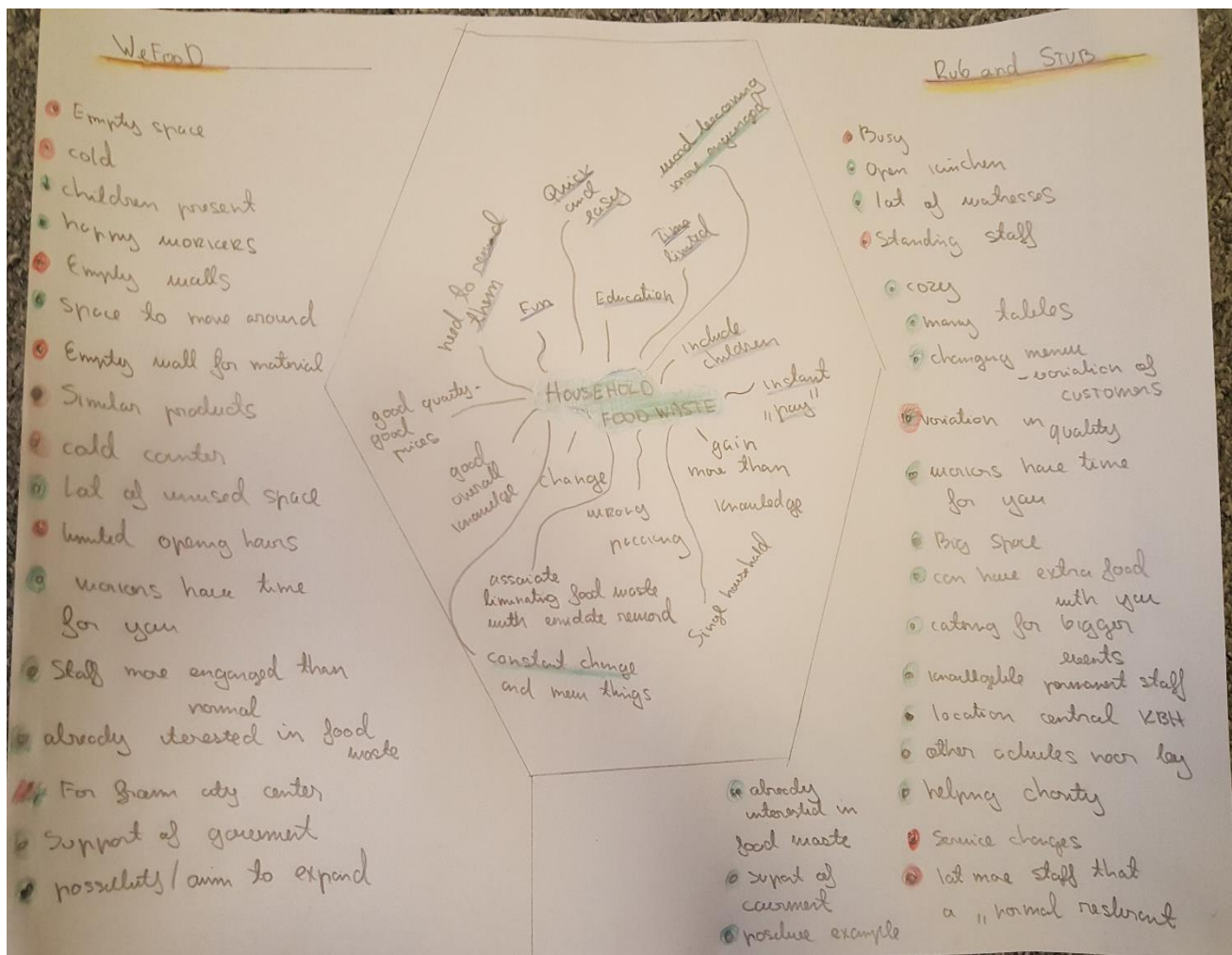


Figure 18 Idea generation process

the observations and comments collected by netnography. This process made it easier for the author to understand what works well and what does not in both locations, and to keep in focus the wishes and views of the target groups.

After this process, the author picked out some keywords that were the most relevant to the new design solution. The new design solution was to incorporate all these words:

- Education
- Fun
- Simple
- Quick
- Rewarding
- Unique
- Memorable
- Easily translatable
- Adaptable

Bearing all these aspects in mind, the author started to elaborate on the initial quiz idea. There are a great deal of tips, ideas, tools etc. available for the Danish population to help them to reduce food waste. Nevertheless, it is unlikely that by solely raising awareness and providing information it is possible to bring about changes in one's behaviour, especially if there is no personal contact involved. Therefore, the author feels that other methods of engaging the target group are more likely to succeed and will have an effect on household food waste.

The author feels that humans should not only be persuaded or influenced by fear, prospective economic gain and environmental disasters. Therefore it was important to incorporate an element of fun into the new design solution. It is also hoped that when people are having fun they are also more likely to remember the facts presented in the quiz.

The interview results show that saving money is one of the top motivating factors in limiting food waste. Environmental considerations come long after money, which means that people are motivated largely by self-interest. Therefore, the quiz had to give something back to the consumers, besides knowledge. Since money is a factor that motivates people to change their habits, the author thought that economical gain might be a persuasive argument to get people to participate. This means that the more correct answers the participants get on their quiz, the more money they will save on their purchases at either Rub & Stub or WeFood. However,

in both cases the consumers have the option of donating the amount they would save to a charity.

The interviews also showed that wasting food makes people feel guilty. One of the aims of this project is also to make people happier and healthier. Experiencing the feeling of guilt does not in any way help people to lead joyful and happy lives. Therefore the quiz is titled: “Guilt Free Quiz”. The title also indicates that participation in the quiz might guide the participants towards a more guilt-free future. In addition, as demonstrated in literature and corroborated by the interviews, planning one’s meals and cooking the right amount of food are positive steps that contribute towards the formation of healthier eating habits. Therefore, it is hoped that the quiz will also help to make the population healthier, both physically and mentally.

The key topics that should be incorporated within the quiz are: shopping, planning skills and the skill of reusing leftovers. In addition to the quiz, there is an information stand that provides extra material on food waste. This means that if the quiz raises any questions, the participants can turn to the information stand and obtain further knowledge on how to reduce their household food waste. Tips that would be easy to implement are provided. According to the literature in the State of The Art section, the more closely together temporally the individual’s behavioural acts and their consequences are, the more likely the chance that the individual will change his or her current habits. What this means is that if people can feel a positive impact of their actions right away, they are more likely to perform this action again. E.g. making a shopping list to save money. Thus a person draws up a list at home and ten minutes later, he or she is at the shop and can see right away that he or she has saved money compared to the last time at the shop. Here, the consequences of an action are almost immediate. It is for this reason that often, environmental factors do not affect the consumers that much: they cannot feel their immediate effect on them. The new design idea intends to bring closer the individuals’ behaviour and the consequences of behavioural acts.

Children have also been included in the quiz, as they are the future generation, and they acquire their habits from their parents. However, the author thought that the Quiz might be too boring for young participants and might not attract their attention the way it is. Therefore, the children’s quiz is titled: “Treasure hunt”. After completing the quiz, children will not receive discounts at the store, but they will be given presents in form of healthy snacks.

All in all, the aim of the quiz is not simply to provide tools and knowledge for the consumers that would result in a change of their household routines, but also to attempt to change their attitudes towards food waste.

7.2 Conceptual design proposal

The quiz is structured in the same way as the children's treasure hunt and it follows the same "game path". In this quiz, the idea of a treasure hunt is presented simultaneously with the Guilt Free Quiz. The Guilt Free Quiz and the treasure hunt are essentially the same. They carry different names to appeal to two different target groups and include a different set of questions, but both of them are played in the same way.

As mentioned previously, it is possible to carry out the treasure hunt idea (quiz) in both of the chosen locations. The treasure hunt itself is a game, which can be played by children and adults. The goal of the game is to find hidden objects by following a trail of clues. At the end, there is usually a big treasure. Usually this is candy if the players are children (Daisy 2016). In this hunt, there are no hidden objects, but rather stacks of small pieces of paper with questions. The duration of the treasure hunt can be anything from a couple of minutes to a few hours. At the Rub & Stub restaurant, the duration of the game will depend on how long the players are staying for dinner. In the WeFood supermarket, the hunt should take around 10 minutes. There are no standard rules about how to organize and perform a treasure hunt.

The first thing to consider when organizing a treasure hunt is the necessary spatial boundaries. The boundaries will be conveyed to the participants in the form of a small map. This ensures that participants will not enter spaces where they are not allowed. For example in both the store and the restaurant there are areas where customers are not allowed. During the hunt some participants might get carried away and enter areas that they would not otherwise. In order to prevent this, the map will highlight the areas where the participants are allowed to go.

The WeFood supermarket has seven clue locations, whereas the Rub &Stub supermarket has six. The reason for the restaurant having less is because it is not advisable to allow people to move around as their movement might disturb the other customers while they are trying to enjoy their meal, whereas at the supermarket, movement is more natural. The locations for the clues and questions are seen in Appendix 2.

The location of the first clue is right near the entrance of both of the locations. This will lead to the next clue and the next location. The clues are written in a humorous manner, for example: “You will find your first question where darkness shines on freshness”. This is one of the clues for the WeFood shop. It is a reference to the place where the fruit and vegetables are displayed, as this is the only area that has completely dark walls. For the younger treasure hunters there will be drawings instead of written clues indicating where the next clue will be located.

At each of the locations the next is not hidden, but is visible to the customers. This is done to avoid chaos at the supermarket and in the restaurant. This way the customers will not start to look through all the food products or start to move things around. At the Rub & Stub restaurant, a waiter will bring two of the clues to the customer. This is done to avoid excessive movement within the restaurant and allows the game participants to enjoy their meal.

The clues in the shop are placed in a box, where the participant can pick them out easily and continue their treasure hunt. The same method will be used at the restaurant, except that two of the clues will be presented by a waiter.

As mentioned previously, before starting the game the players will receive a map of the area where the game will be played and their first clue. They will also be given a piece of paper where the answers to the questions can be written down. A small pencil, like the size they have at Ikea will be provided. Instead of having Ikea written on them, there will be a tip on how to reduce food waste. Participants are encouraged to take the pen home as a souvenir, as are people who do not wish to participate.

The quiz is multiple-choice, and each question is numbered. The participant only needs to colour the right answer bubble, which is shown on the mood board (presented further on). This makes it easier for the participant and is less time consuming. Also in this way, it will be easier to check the answers once the game is done.

At the Wefood supermarket, the questions will be checked at the last checkpoint, which will be at the cash register. The participants are also encouraged to do their shopping while they are playing. The more correct answers the participant receives, the bigger percentage of the discount will be. Customers can choose not to take the discount and to donate the sum to a charity. The charity will be the same one that the profit of the store goes to. At the Rub &Stub restaurant the last stop is not at the cashier, because the ordering of food at the bar occurs in the start. The waiter will be responsible for checking the answers and offering a discount as well as the possibility of donating the sum to the charity that they already support.

The questions will be changed every week at the supermarket, and there will be four different sets. At the food waste restaurant, they will rotate every month, and there will also be four different sets. There will be several other folders about food waste at first point where the first clue can be found. In addition to the material, there will also be a complimentary shopping list guide. It will contain a checklist to use prior to next shopping tour. The checklist would include features such as a template that can be used to check your food levels prior to shopping, a folder with correct portion sizes and recipes for leftovers. These will be presented together with a sheet with the correct answers. The questions are based on the issues that were derived from the data analysis.

The mood board can be seen in Figure 19. The author has used it to formulate the key elements of the Guilt Free Quiz. The mood, actions, values and ambience of the food waste initiative organizations are conceptualized. These are done through photos that show an uplifting fun environment. Following this, on pages 98 and 99, examples of questions that would appear on the adults' quiz are displayed as well as a set of questions for the children's quiz. The correct answers are written in green. On the next two pages (100 & 101), there are examples of the posters that would be displayed near the food waste initiative brochures to get people to come in and participate. The first one is aimed for adults and second one is for children.



Figure 19 Mood Board, New design solution-Guilt Free Quiz

Quilt Free Quiz

1. Making a shopping list will help me to (Please select all answers that you think are correct or apply to your situation)
 - a. Reduce my grocery bills
 - b. Save time
 - c. Enjoy health benefits
 - d. Reduce waste at home
2. Is it safe to eat a banana with brown spots?
 - a. No, because it poses a health risk
 - b. Yes, because the more brown spots it has, the more sugar it contains
 - c. Only if the banana has not passed the best before date
3. How long, and where can you store ground meat?
 - a. In the fridge, for 2 days and in the freezer, for 4 months
 - b. In the pantry, for 2 days and in the fridge, for 3 days
 - c. In the fridge, for 1 day and in the freezer, for 2 months
 - d. In the fridge, for 5 days and in the freezer, for 8 months
4. What is the optimal temperature for your fridge?
 - a. 0°-1° C
 - b. 0°-4° C
 - c. + 6° C
5. Some of the food in your fridge has expired. What should you throw out? Select all the answers that you think are correct
 - a. Raw prawns that have been open in the fridge for 4 days
 - b. A mouldy tomato
 - c. Green peas with an overdue date
 - d. Cold ham that has been opened and that expired 5 days ago
 - e. Milk with the yesterday's expiration date
6. Why is it not a good idea to keep milk in the door of the fridge?
 - a. It will not be easily accessible for children
 - b. It will decrease its shelf life, due to the fact that the temperature of items in the door can get as high as 15 degrees.
 - c. It is the best option, because that is their designated place
 - d. It will make it too easy for robbers who can steal your milk while they eat your cookies
 - e. Milk can be contaminated by the items next to it
7. An average Danish family with 2 adults and 2 children throws food out the monetary equivalent of...?
 - a. 1000 Danish Kroner per year
 - b. 5000 Danish Kroner per year
 - c. 15,000 Danish Kroner per year
 - d. 10,000 Danish Kroner per year

Treasure Hunt Questions

1. Can you eat a carrot that looks like this?
 - a. No
 - b. Yes



2. Should mommy or daddy check the fridge before buying more food ?
 - a. No, because they always remember everything!
 - b. Yes, we might buy something we already have, and it will get old before we can eat it



3. What should you do when your banana gets a brown spot?
 - a. Throw it in the garbage
 - b. Put it back where you found it
 - c. Eat it, because brown spots will not harm you



4. When you cannot finish your plate, is it safe to put the leftovers in the fridge and eat them later?
 - a. No, they are poisonous, you have to throw them out
 - b. It is perfectly safe to store food in the fridge and eat it the next day, maybe for lunch



5. Is it true that you can eat potatoes without peeling them?
 - a. No, the potato peel is not edible
 - b. Yes, the potato skin just needs a good wash, and it is the most nutritious part of the potato
6. When you go out to eat and cannot finish your plate, what should you do?
 - a. Nothing
 - b. Ask the waiter to pack it up for you to take home
 - c. Ask other people around the table if they would like to finish your plate
7. Is it good for the planet when we throw out food?
 - a. No
 - b. Yes



Reduce - household food waste!

Guilt Free-

Quiz

More you know- more you save

LEARN ABOUT FOOD WASTE

Come eat at Ryb & Stub
Participate in our house quiz
Prices: discount on your meal or
donation to charity

Ryb & Stub-Rådhusstræde 13, 1466
København

Figure 20 Poster (Adults, Guilt Free Quiz)

ARGH... YOU'RE INVITED



AAARGH!



Come treasure hunt at
Rub & Stub

Learn about food

Join fun
Find clues
Answer questions
Win prizes



Rub & Stub
Rådhusstræde 13, 1466 København

Figure 21 Poster (Children, Treasure Hunt)

8 DISCUSSION

The inspiration for this Master's thesis grew out of a wish to explore how the author's interdisciplinary food related background could help to create efficacious changes for the population of a municipality in Copenhagen. The aim was to use the Rub & Stub restaurant and the WeFood store as platforms for educating people on household food waste.

The design thinking perspective helped the author to gain a deeper insight into the thoughts, experiences and views of the target groups by means of design tools and interviews. The design thinking method assisted the author in making sense of the complicated nature of food waste. It also allowed her to empathize with the end users of the design solution. Likewise, this approach, in combination with the social practise theory, enabled the author to make sense of the gathered data and then to implement this understanding while constructing new design solutions for the case studies. The design thinking process calls for an iterative method, whereby possible solutions to the problem at hand would be prototyped and tested within a real-life context and in relation to the end users. If time had allowed, this process would have been included in the thesis. The focus of this thesis is only the first, inspirational phase and the second phase of ideation. The implementation phase was not included in the scope of this thesis. The use of this strategy, on the other hand, made it possible to suggest a conceptual design idea that is applicable for both of the study cases.

Mapping allowed to open up the potential of the two study cases and made it easier for the author to analyse it and to create new solutions. The Persona helped to visualise the target groups' complex problems when dealing with practises related to food waste. It gave a better insight into the minds of the target groups. The Persona helped to keep the focus on the end user while designing a new solution. The Storyboard helped to further clarify the new design concept. The storyboard likewise helped to identify confusing and problematic areas of the new design solution. Overall, the Persona and Storyboard enabled the author to communicate scientific research in an understandable way.

The analyses allow the author to conclude that the case studies have the potential to be used as platforms to reach out to the population. The analyses and results show that a person's

skill level in dealing with food has a direct correlation with their leftover reuse, planning, and shopping routines. The main attributes affecting household food waste are: shopping routines, planning skills, leftover reuse, packaging sizes, income, household size and composition, feelings of guilt, waste management, and knowledge of food labels. People are also influenced by cultural mores such as hospitality, the wish to be a good provider for their children, and a desire for abundance.

The interview participants seemed to know how to cook and their abilities in the kitchen were quite good. However, one of the main reasons for people wasting food was ascribed to their lack of planning. From a survey of the gathered literature in the State of the Art section, it is evident that shopping practises and leftover-reuse was the most dominant factor and was only complimented by planning skills. All of the interview participants had advanced cooking skills and acknowledged possible shortcomings in their shopping routines. A planned shopping routine could result in less overbuying, as consumers would not miscalculate what they already have at home and therefore the food items would not deteriorate because the person could not consume them in time. When people plan meals before they go shopping they tend to make healthier choices and have better control over the portion sizes.

The context in which individuals live plays an important role. From the interviews it was evident that people who lived alone often had difficulties finishing food, because the packing sizes are too big for their needs. This is also a problem for families. In a family if one member is the only one who eats a certain type of food product, it is highly likely that the food product will not be consumed before it has become outdated. Children also play an important role. The younger ones can often be particular about what they eat. They may refuse to eat something, or request new fresher things. The older children of the interview participants had different views on expiration dates and when to throw out food than their parents did and would often therefore discard perfectly edible food. Some of the parents were also afraid that their children would get food poisoning and were much more careful about what they give to their children. The fact that throwing away food might be more expensive for consumers was offset by the desire to avoid health risks. For these reasons it was vital to incorporate children into the new design solution.

Composting and recycling could potentially reduce household food waste, especially if people would have to pay for the amount they throw out. Recycling would make people think twice on what they are actually throwing away.

Consumers like to have freedom of choice, even if it might result in higher food budget. Nowadays people are used to the fact that food is easily accessible and abundant. Even though money was one of the main incentives for changing food waste habits, people are not willing to compromise on variety and abundance.

From the interviews, it did appear that the interview participants were not fully aware of the consequences that discarded food has for them and for the environment. This however is not uncommon, as people find it difficult to equate the effect of household food waste with a negative impact on the environment.

From the interviews it was evident that food waste is perceived as morally wrong that makes people feel guilty. This however can be seen as something positive. It means that people are more willing to change their current habits. If they did not associate wasting food with negative feelings, they would be more reluctant to change. Feeling guilty is a motivator.

Consumers should realize that the food waste problem is an everyday problem that originates from their daily routines. It is easy for consumers to see food waste as someone else's problem, or as something that is the domain of retailers, government etc.

There seems to be a great deal of awareness among Danish consumers, which is a positive step towards changing the behaviour. Awareness, however, should be further augmented with practical tools to support the pre-existing acknowledgment of the issue. The new design solution described in this Master's thesis provides a way of raising further awareness of food waste, while enhancing education and providing practical tools that consumers can easily implement.

There are many initiatives seeking to increase people's awareness that have already been implemented in Denmark, but this latest solution is different in that in addition to promoting food waste initiatives to the general population, it also tries to get people to be more actively involved in the process. In this way, if the general population hears the words "food waste" more often, it could result in them thinking more about it and acknowledging their own part in it. Analysing the food waste initiatives showed that there is space for implementation of a

variety of techniques to get people to waste less food. As urban areas generate more food waste than rural areas this design solution was designed to specially target people living in the city, although it should be noted that the two case studies, the WeFood market and the Rub & Stub restaurant, get visitors from all over Denmark and abroad.

The new conceptual design solution envisions an innovative way for these establishments to interact with their clients. This new design solution integrates the values of the organizations into their overall business strategies. It also allows them to differentiate their organizations from the mass-market retailers and gain wider recognition. The new design solution will also help the organization to engage more with their customers. Finally it would even help educate the staff of the case study establishments on food waste.

More research should be done on the determinants of household food waste, in order to better understand the practises that generate food waste.

8.1 Limitation of the study

Qualitative researches methods are mainly used to study people's attitudes, opinions and feelings. The outcome is affected by the selected methods, the study design and the researcher's own interpretation skills. The current study analysed the views of a group of consumers and their habits related to food waste. The selected approach enabled the author to obtain a more holistic view of the investigated topic of food waste.

The main technique for this study was a semi-structured interview with the consumers. However, some researchers have expressed doubts about the validity and outcomes of interviews. Interviews can be unreliable and are subjective. An interview could possibly lead to personal bias, which would affect the outcome and reliability of the study (Saunders 2009 p. 345). This could have been a factor in this study because one of the interview participants was the author's schoolmate. This allowed the interview to progress more efficiently because there was no need for further introduction and clarification because the participant was already aware of the study. The rest of the interview subjects may have been more objective,

since the author did not know them personally and they had no background in food related education.

The number of consumers (n=4) who participated in the semi-structured interviews was not sufficient enough to make broad conclusions about the determinants of household food waste, although they did give enough insight into the problem to allow the author to construct a conceptual design proposal. It is possible that if the author was more fluent in Danish, the interview participants could have divulged more as it would have been easier for them to express their views.

The scope of this study was rather broad and this prohibited the author from investigating in great detail. The findings from the interviews were sufficient enough to make conclusions that would aid in the idea development process. There are several dimensions of this topic that could be investigated further, such as: behavioural changes, factors affecting children's perception of food waste, children's overall knowledge of food waste, existing consumer knowledge of other food waste initiatives, the efficacy of other Danish initiatives seeking to reduce food waste, and investigating how consumers develop their food related skills.

9 CONCLUSION

The aim of this paper was to study the determinants of household food waste and to analyse the findings in order to conceive a solution and apply it towards the creation of an educational design solution for the Rub & Stub restaurant and the WeFood supermarket.

Semi-structured interviews with consumers were carried out in order to gain an understanding of the consumer's practises, routines and views regarding their own food waste. Based on the interviews it was possible to develop an educational design solution and to answer the research question. In addition to conducting the semi-structured interviews, the author also created a Persona, developed a storyboard, and constructed mood boards. Several food waste initiatives were mapped, observational touchstone tours were undertaken and netnographic research was conducted.

The causes of the behaviours and practises connected to household food waste are complex. However, the interviews showed that lack of planning routines was the predominant factor in generating high amounts of household food waste. The other relevant aspects included: shopping routines, leftover reuse, packaging sizes, income, household size and composition, feelings of guilt, waste management and knowledge on food labels.

The new conceptual design solution takes the form of a game/quiz for the adults and a treasure hunt for children. This interactive game will educate the consumers on food waste and will also provide practical tools and additional information.

The main objectives of this research were achieved. It is hoped that the author's analysis of the results, together with the new design solution will provide a perspective and a set of tools to organizations seeking to further educate their customers.

It can be concluded that consumers in Copenhagen metropolitan area can benefit from the new design solution, as it is a unique and creative way to communicate with the consumers on the topic of food waste.

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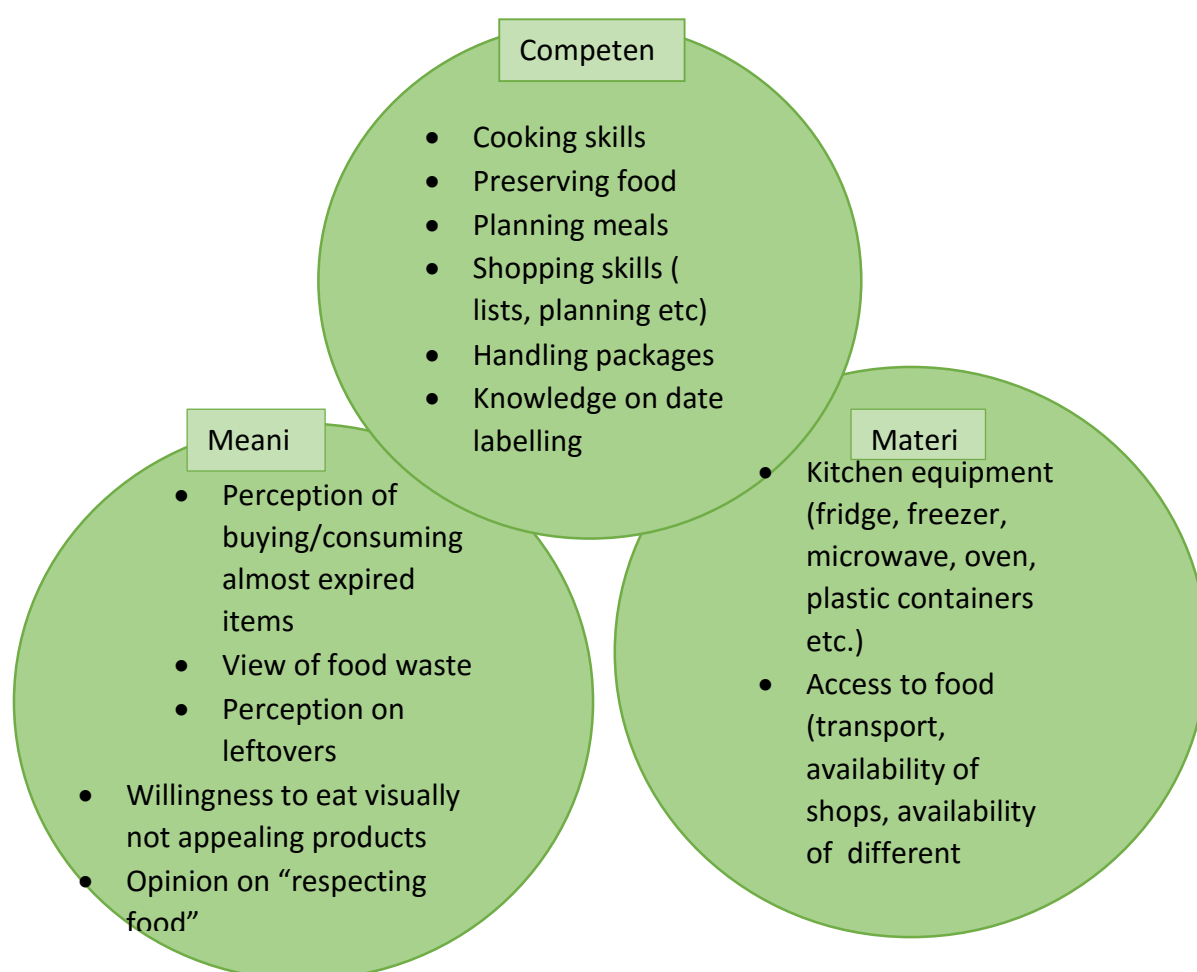
11 APPENDIXES

Appendix 1. Questions for the Semi-structured interviews

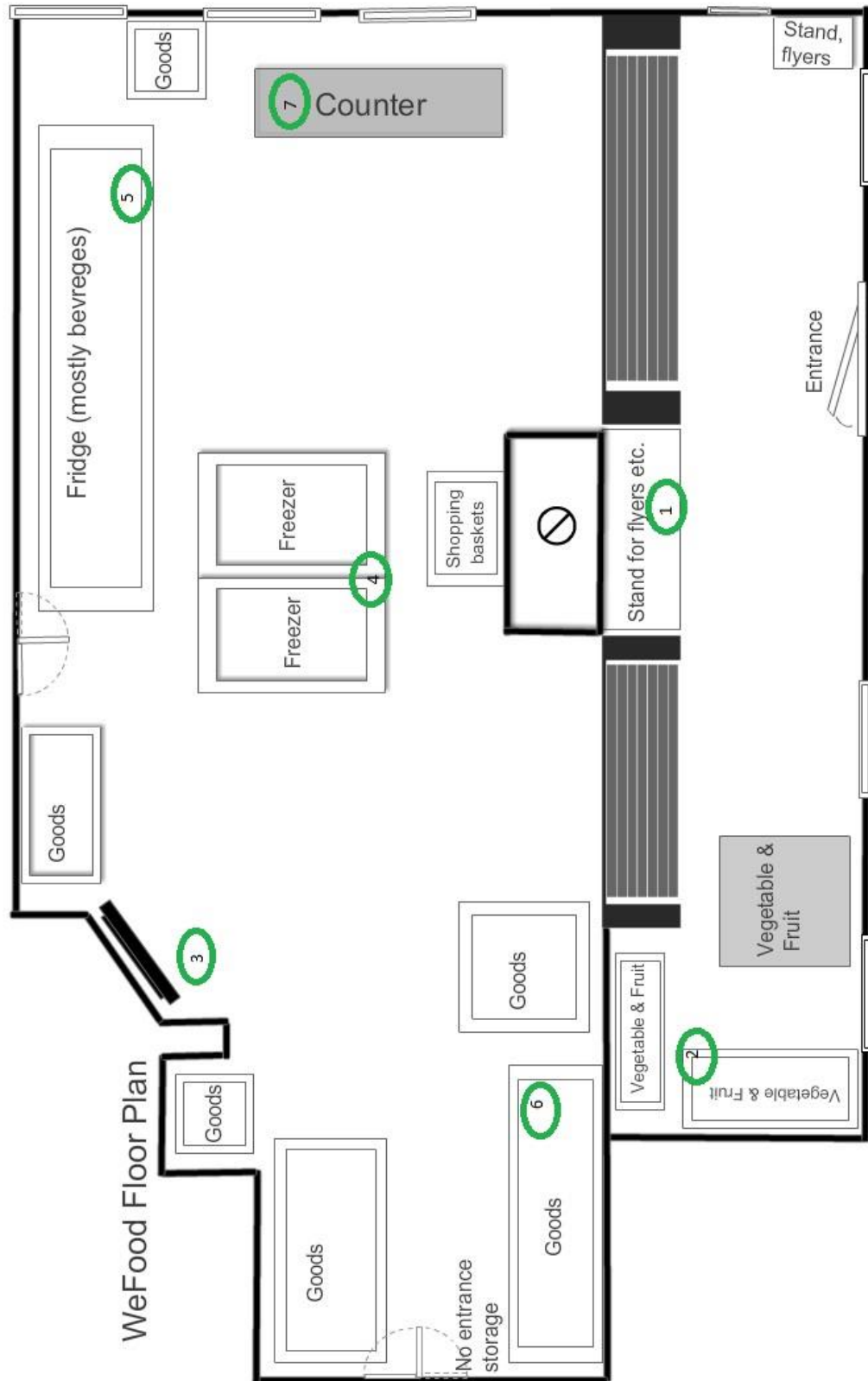
1. Can you define food waste in your own words? - What food waste means to you ?
2. How much edible food do you throw out per week? – *by edible I mean food and drink thrown away that was, at some point prior to disposal fit to consume, If you can put this in kilos, half a kilo, kilo etc..*
3. What measures do you take to avoid food waste? What precautions do you take to limit food waste ?
4. How far is the primary grocery store you shop at, do you feel it's easy for you to get there? - *Are there any other choices near you? - How many times per week you go there?*
5. Do you check your levels of food in cupboards and fridge prior to shopping?
6. How do you plan for what you going to buy at a grocery store? (shopping lists, look at the flyers, spontaneous)
7. Do you go after on food that is on offer (tilbud) at the store, do these offers make you sometimes buy more than you can consume?
8. How do you feel about buying food, which is close to its expiration date?
9. Do you look at expiring date on food items and if you do then why?
10. What are the main features you consider when buying food? (Price, organic, brand etc.) ?
11. *Are the food packages size suitable for your needs and are they comfortable to handle?*
12. What do you feel about cooking?
13. What dishes do you prepare/ eat typically for dinner and how do you measure portions sizes?
14. Do you always finish your plate?
15. Do you plan your meals ahead of time? When planning meals, do you ever think what could be made with the leftover food?
16. If you cook too much food, do you save the leftovers, If yes do the leftovers end up eaten?
17. Are you aware how to store different food items for example: meat fruit , bread etc. (temperature, packing wrapping) ?-
18. Does the food need to be visually appealing to you? For example spots on fruit, does it hinder you on consuming the fruit?

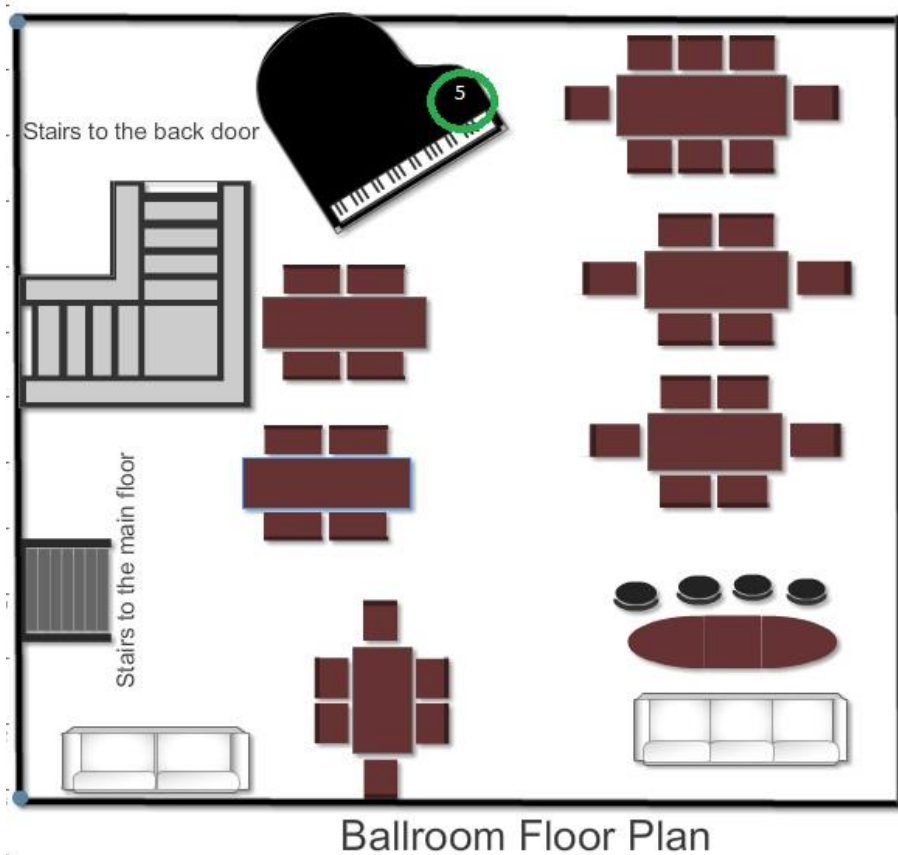
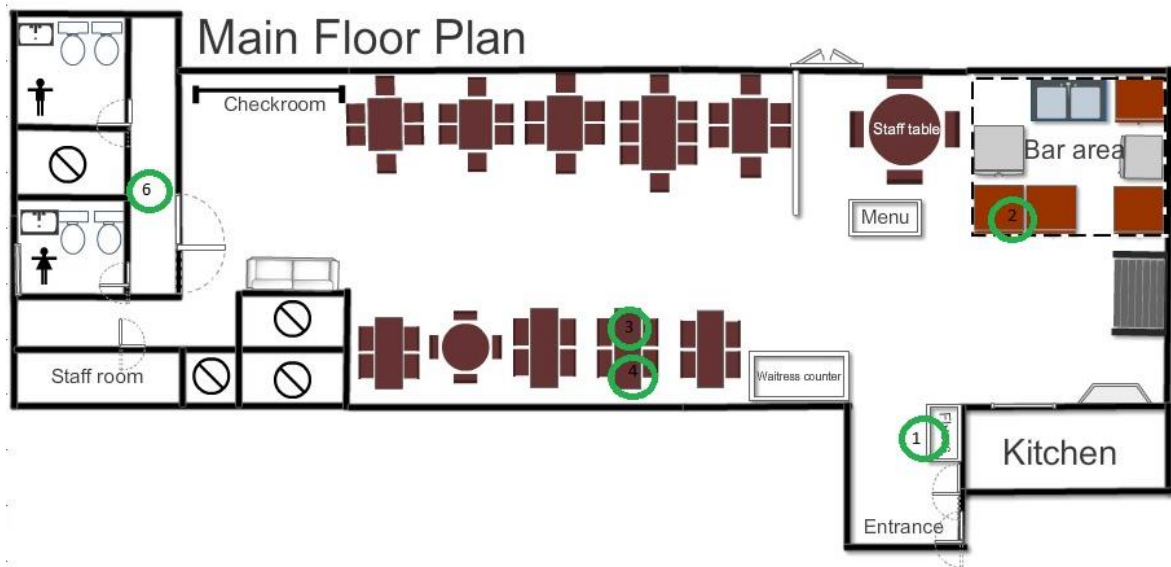
19. Do you research and follow the recommended storage information on packaged goods?
20. Do you throw out food that has reached its expiration date on the package or do you depend on your other senses?
21. If you notice that an item of food is coming close to its best before date, what do you do?
22. How do you pay for your garbage
23. Do you compost, if not what is your knowledge on composting?
24. What do you think there could be done to change people's habits on food waste?
25. *How do you feel about throwing out food?*
26. Would you change your purchasing and preparation habits if this saved you money on your grocery bills?
27. Would you like that there would be more recipes/tips for public on how to minimize food waste at your home?

Elements of household food waste based on **the dynamics of social practice** by Elisabeth Shove, used to plan the interviews:



Appendix 2. Clues for the Floor plans





Appendix 3 Sample of Interview transcription

Agnes: What does food waste mean to you?

Sara: The word?

Agnes: Yes, can you define it in your own words.

Sara: For me food waste is when either industry producers more than there is a need for us so that, due to consumers demanding that there is always fresh produced whenever they need it which means that there will always be something that needs to be thrown out at stores when they close and night. And then its the waste that happens at home. Where we sometimes cook too much, and then we kind of get tired of the leftover and then suddenly we forget them in the refrigerator and then we throw it out or the kids like open five different five types of sausages or liver patty or whatever. Then it grows old and I have to throw it out because they demand great variations. Who thought them that? I did!

Agnes: Next one can be a bit difficult. How much edible food do you throw out per week? If you can put this in kilo or half a kilo?

Sara: That is difficult. I think it's more actually because sometimes we throw out lot of bread because some bread only last two or three days and then it kind of turns green. So I think what I throw out are fruits, that get too old and it is bread and it is kind of heavy right. Because I really don't throw that many leftovers out but I would say a few kilos a week at least. Yes two, three due to the bread. But I actually feed it to the rabbits.

Agnes: So you have rabbits that you take leftover food too?

Sara: Yes, I use to have three but two of them escaped last week. Now I have one. Well my kids have, but yes we feed them green leftovers and also bread if it is not too rotten.

Agnes: What precautions do you take to limit food waste at your own home?

Sara: We try to make a food plan. That does not always stick. We get Aarstiderne, do you know what it is ? Aarstiderne is the very first huge farm that started to produce organic. Then they put it into basket and then you can order like one meal or three meals for X amount of persons. Then they bring to your door with recopies and everything. So you only have too, so you cook it all from scratch. Aarstiderne it means seasons. And we order that every second week because then they give us exact amount we need for the meals. They tell us what to do, so we don't need to shop. The problem is that sometimes week before we forget that we they bring food on Sunday. Then we shop for the weekend, and then suddenly we have a lot of vegetables or salad or load of. And then I treat my rabbits very well, and that is kind of of

food waste to me. Because we were supposed to turn down our own shopping because they do it for us.

Agnes: But you don't do it every week?

Sara: No every second week. Because we have four kids at home, most of the second week the other week, they are at the other parents. So that is not a problem. That is not such a big problem to cook.

Agnes: How far the primary grocery store is from you?

Sara: My primary is 3 kilometers away and then my tiny local brugsen is 800 meters away. But they don't, there is not big variation, they provide me what I forget, like potatoes, milk just you know oo I forgot to buy, then I go up there.

Agnes: Is it easy for you to get to the one, the one 3 km away?

Sara: No, I always have to been in a car. Because we also are such a big family, I cannot have it on the bike.

Agnes: Are there any other choices near by you ?

Sara: Yeah I have a, you want them ? Irma, Netto, Kwickly and then I have the small brugsen and then on other end of town there is like biggest Netto in Denmark, its huge. And then we have a lot of small bakeries and two fish stores so we got it all.

Agnes: How many times per week do you buy your groceries?

Sara: Two, three times, without whatever I forgot to buy. Sometimes we use online shopping. Nemlig.com or Irma. Because then again it is easy. But since we started with Aarstiderne, they actually provide enough for a whole week. Its meats its fruits vegetables.

Agnes: So it is everything.

Sara: It is everything.

Agnes: Do you check your how much food you have prior you go shopping?

Sara: I do but my husband does not. So we often double supply. And then is where the food waste problem comes in.

Agnes: I think you already mentioned before with the milk but how do you plan your shopping at a grocery store? Do you have shopping lists, look at the flyers or is it spontaneous?

Sara: It's a mix. Because I always make a list based on what I do not have and what I really going to need. And then we always buy like three times of the amount of everything else, when I'm at the store. I get very what you call that, tempted! So I actually, we it is so much easier for us if we have a budget. It is so much easier for us to keep the budget if I shop

online. I do not get tempted. And when I send the kids to shop for me. Because they do not like to shop, so they only shop what is on the list.

Agnes: And they don't pick candy? Sara: No. I always get the receipt.