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Shouldn't We Cry Over Spilt Milk?

Food waste behaviours, attitudes and solutions among households with children in Norway

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Master of Science
International Environmental Studies

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A mixed-methods study of food waste habits, attitudes and solutions among households with children in Norway

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Declaration

I, Frida-Marie Andestad Elstad, declare that this thesis is a result of my research and findings. Sources of information other than my own have been cited and a reference list has been appended. This work has not previously been submitted to any other university for award of any type of academic degree.

Date……..01/06/2021…….

Signature……Frida-Marie Andestad Elstad……..

Acknowledgements

The basis of this research originally stemmed from my passion for food waste and sustainable development. As the world moves further, the issue of climate change becomes more prominent. How will we face these challenges? It is my passion to not only find out, but to develop and promote sustainable solutions to break down barriers for future generations.

In truth, I would not have been able to achieve my current level of success without a strong support group. First of all, I would like to express my sincerest gratitude to my supervisor Arild Vatn for his continuous support and encouragement, both during my internship at CICERO and throughout the thesis process. I also want to give the deepest thanks to my internship- and co-thesis-supervisor Marianne Aasen at CICERO for all support and guidance. Also, a big thanks to all the professors and lecturers at Noragric for the great inspiration and motivation during my time here.

Furthermore, I want to express my gratitude to my friends and family for their love and endless encouragement. The deepest thanks also goes to all those who have read through this thesis and provided insightful feedback throughout this process. Lastly, I would like to thank my amazing partner who has been caring, curious and critical throughout the whole thesis-process. Had it not been for our disagreement on household food waste and difference of opinion on what is still edible after its expiration date, this thesis would not have been written.

Abstract

The main objective of this thesis is to document research conducted at The Norwegian University of Life Sciences, on the behaviours, attitudes, and solutions regarding food waste deriving from households with children in Norway. The background and issues motivating this thesis include the high amounts of greenhouse gas emissions generated by food waste, the deprivation of valuable resources as a consequence, and private households standing for most of the waste. In Norway, the goal is to reduce the quantity of food waste 50% by 2030. As 60% of the total food waste in Norway derives from households, mostly households with children, this thesis aims to shed light on the habits, attitudes, and solutions that are beneficial in the reduction process. This objective was specified into the following research questions: *(i) how much food waste is created from households with children; (ii) why are households with children wasting food; (iii) are the respondents from these households interested in reducing food waste;* and *(iv) what kind of measures do the respondents from these households believe should be implemented to reduce household food waste?*

Being a part of the ACT-project at the Centre for International Climate Research (CICERO), an adapted theoretical framework from this project is employed, built mainly on theories from social psychology, institutional theory, and practice theory. Through quantitative data and 20 semi-structured interviews, the framework is used to identify archetypes and themes of analysis. Findings denote that several factors (e.g., personal norms, social norms, habits) influence food-wasting behaviours and attitudes. In general, respondents that reported a higher interest in food waste, also reported to be wasting less food. Moreover, the respondents who wasted the largest quantities of food were also the ones with the least interest in changing their food-wasting habits. Their suggested solutions depended on their attitudes and beliefs. For instance, respondents interested in health and nature suggested initiatives to influence norms, whereas respondents not interested in food waste proposed financial incentives. Two solutions are suggested for decreasing household food waste: (i) policies that target the individuals who waste the most, for instance through monetary bonuses; and (ii) individuals with different set of habits, norms, and attitudes should be gathered to spark reflections and changes in the food culture and how one views food-wasting practices.

Keywords: food waste, matsvinn, household food waste, food waste behaviours, households with children, attitudes, holdninger, norms, climate change, ACT, CICERO.

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Chapter 1: Introduction

As global consumption of goods and the greenhouse gas (GHGs) emissions are on the rise, it is essential that countries, governments, and citizens across the world establish a culture of less waste and decreased emissions. Global trends in emissions sources reveal that sectors such as industry, oil and gas extraction, and road traffic account for most of the CO_2 emissions (SSB, 2019a). However, 8% of the global GHGs emissions are generated by food waste (European Environment Agency, 2016). This is worrisome as the global food production uses valuable resources, such as freshwater supply and land area.

Norway is among the developed nations that have a pattern of wasteful consumption and of being top emitters of GHGs (SSB, 2019b). The per capita emissions in Norway are more than double the global average, and when looking at individual consumption, the consumption level in Norway is 27% above the European Union (EU) average (ibid.). Corresponding with global trends in emissions sources, similar sectors account for most of the CO_2 in Norway as well. However, corresponding to 25% of the emissions deriving from the road traffic emissions in Norway, 5% of the total emissions are generated by food waste (Stensgård et al., 2019; NHO, 2020). In Norway, an average of 385,000 tonnes of edible food is wasted yearly, accounting for produce worth more than 22 billion NOK on the market, and a climate footprint of 1.3 million CO_2 equivalents per year (ibid.).

In 2017, the Norwegian government pledged that by 2030 the national overall quantity of food waste should be reduced by 50% (NHO, 2020). The food industry in Norway joined the initiative, and some of the largest food producers have already reduced their food waste by more than 50% (ibid.). However, the food production industry in Norway only accounts for about 24% of the overall food waste, and in order to achieve the reduction desired by the Government by 2030, reduction must be facilitated in the most wasteful sectors. Consumers in private households account for 60% of the food wasted in Norway, equalling approximately 73kg of edible food wasted each year per citizen (Stensgård et al., 2019; NHO, 2020). Thus, finding ways to reduce waste in private households is key. In the 2019 annual survey for the ACT-project, conducted by the Centre for International Climate and Environmental Research (CICERO), 57% of the respondents stated that they were willing to reduce food waste as their prominent change in order to decrease GHGs emissions (Aasen et al, 2019). Moreover, research conducted by Østfoldforskningen (2019) on food waste habits among households in Norway found that most food waste derives from families with children under the age of 18 (Stensgård et al., 2019). While the research conducted by CICERO shows that there is willingness among the general population in Norway to decrease their food waste, there is a need for further research on how to facilitate such reduction, particularly in families with children as they account for a large fraction of food waste in Norway (Stensgård et al., 2019).

The main goal of this thesis is therefore to increase our understanding of the behaviours and attitudes regarding household food waste in Norway, and to investigate what measures could be implemented to decrease the waste stemming from private households. Through a mixed-methods approach, this thesis will focus on researching the behaviours, attitudes and solutions regarding food waste from families with children under the age of 18. This will be done by analysing national quantitative data collected by CICERO, through the ACT-project, and in-depth interviews collected in the municipality of Ringerike.

The following research questions have been formulated to respond to the defined aim:
(i) how much food waste is created from households with children?
(ii) why are households with children wasting food?

(iii) are the respondents from these households interested in reducing food waste?;
(iv) what kind of measures do the respondents from these households believe should be implemented to reduce household food waste?

This thesis is divided into seven chapters: chapter two lays out the topical background, whereas chapter three presents relevant theories and the theoretical framework applied for analysing and discussing the attitudes and behaviours among these households. Chapter four is concerned with the methodology, data collection, and data analysis tools. Chapter five lays out the analysis, whilst chapter six discusses the findings. The final section draws the conclusion of the analyses and discussion, and provides recommendations.

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Chapter 2: Topical Background

The history of food waste

This section will provide general insights about the research topic. The literature on food waste is extensive, but this chapter will focus on the themes from the literature relevant for this thesis. Firstly, I will give an account of how food production and food waste affect the environment and food security globally. Next, I will present the research on household food waste, and lastly, I will give a description of literature on approaches to combating household food waste.

2.1 The Environment and Food Security

In the last decade, there has been growing awareness of the impact of food waste on the environment, from national and international policymakers, international organisations, as well as academics from various disciplines (Schanes et al., 2018). Food waste has a detrimental effect on the environment through the whole value chain, from production, to distribution, sales and waste treatment (Gustavsson et al., 2011). According to the Food and Agriculture Organisation (FAO), 1.3 billion tonnes of food produced for human consumption is lost or wasted annually (FAO, 2020). Food loss refers to losses during the harvesting stage, whereas food waste refers to waste occurring during the consumer stage (ibid.). There are major geographical differences on food loss and -waste: in developing regions most food is

lost in the production stages, whereas in developed regions most waste occurs in the consumption stage (WRI, 2011). In North America and Europe, between 50% and 65% of the total food loss/waste can be attributed to consumers (ibid.).

As the production of food is resource intensive, food loss and waste are thus accompanied by several environmental issues, such as deforestation, soil erosion, and increased GHGs emissions (Schanes et al., 2018). The livestock industry, for instance, is responsible for 14.5% of human-induced GHG emissions (Gerber et al., 2013). Additionally, agriculture uses more than one-third of the global land area, and accounts for 70% of the freshwater usage (FAO, 2018). Together, agriculture and land use represents about 25% of the total GHG emissions in the world, and its emissions are expected to rise if the current practice is not altered (ibid.). A concerning amount of agricultural products are wasted and lost, including, 45% of all fruits and vegetables, 20% of all dairy products, and 20% of all meat produced are lost or wasted (FAO, 2015). Hence, "*food production systems are a major source of resource waste in a world of finite resources [...], the waste are themselves important drivers of anthropogenic global warming, whether from the waste of fuel oil used to transport food straight into the landfills [...], or from the millions of tons of greenhouse gases created by that waste*" (Cloke, 2016:101).

The food production systems are not only detrimental to the environment, but also to global development and food security. As noted, consumers in North America and Europe account for a large fraction of food waste, and one third of this waste has the potential to feed the 842 million people who are starving globally everyday (Gjerris & Gaiani, 2013; Helgesen, 2015). Thus food waste and food production have a major impact on global food security (Porter et al., 2014). There is no direct link between decreasing food waste in developed countries and improving food security in developing nations, however, reducing the overall food waste "*may have a positive impact on long-term food security through the efficient use of resources and environmental impacts" (Tielens & Canel, 2014).* In addition, according to the *UNEP, "reducing food lost or wasted means more food for all, less greenhouse gas emissions, less pressure on the environment, and increased productivity and economic growth"* (UNEP, 2020).

The complete eradication of food loss and food waste is impossible due to unintended consequences that may occur in the early stages of the supply chain, such as crop damage, postharvest losses, or contamination in the food processing (Papargyropoulou et al., 2014). However, several studies suggest that it is possible to immensely decrease food waste from the last stages in the supply chain, and in North America and Europe, private households have been identified as key actors in this solution (Schanes et al., 2018).

2.2 Research on Household Food Waste

This section will present research on household food waste. This will be done through discussing the definitions of food waste, how much food is wasted annually, what kind of products are wasted, and why food waste occurs.

2.2.1 Definitions

There are several definitions of food waste in the literature. This differs from country to country due to cultural differences of 'what' parts of food are edible (Gjeeris & Gaiani, 2013). However, most literature on food waste deriving from North America and Europe utilises the definition created by the FAO, which is: *food waste refers to the discard of edible foods at the retail and consumer phase* (FAO, 2020). FAO (2020) further divides food waste into three categories: unavoidable waste; possibly avoidable waste; and avoidable waste (Fig. 1).

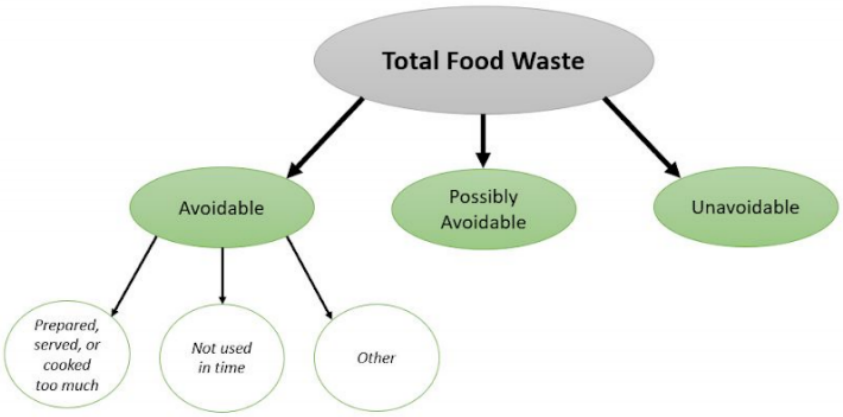

Figure 1. Classifications of Food Waste

Source: Adapted from FAO (2020)

Avoidable waste refers to food that prior to its disposal was edible, such as leftovers. Possibly avoidable waste is food that some people eat and others do not, such as bread crusts and potato peels. Whether this is possibly avoidable waste often depends on cultural context and habit (Gjeeris & Gaiani, 2013). Lastly, unavoidable waste refers to waste that is not edible under normal circumstances, such as eggshells, bones, banana peels.

2.2.2 Food Waste Amounts

Several studies on food waste have found that between 55% and 70% of food waste deriving from private households annually in Europe and the U.S. is avoidable waste (Helgesen, 2015; Aschemann-Witzel et al.; 2018, Conrad et al., 2018; Stensgård et al., 2019). However, there are disparities in the literature regarding the overall food waste coming from private households, which seems to stem from differences in how food waste is measured and the organisation of a public waste management system. In Norway, a study found that people living in municipalities with a separate food waste disposal system throw away around 10 kg more than people living in municipalities without a separate food waste disposal system (Helgesen, 2015). Another study from the U.S. found that the amount did not differ between the households with and without a separate food waste disposal system (Conrad et al., 2018). The reason for these differences in measurement seem to arise from that some studies only measure trash from the food waste disposal system, and do not include other ways food waste can be disposed, such as being poured down the drain (i.e. milk, yoghurt, gravy) or being composted (WRAP, 2009; Stensgård et al., 2019; Conrad et al., 2018). Some researchers have found that the per capita food waste annually in Europe is around 72kg (Helgesen, 2015; Stengård et al., 2019), while others show findings of 172kg (Aschemann-Witzel et al., 2018). In the U.S., the average per capita food waste is approximately 270kg (Conrad et al., 2018).

2.2.3 Most Wasted Products

Fresh vegetables and fruit, baked goods, and meat and fish appear to account for most of the food waste from private households (WRAP, 2009; Helgesen, 2015; Conrad et al., 2018; Stensgård et al., 2019). Furthermore, there seems to be a consensus among the literature that most of the food waste occurs due to leftovers (WRAP, 2009; Helgesen, 2015; Conrad et al., 2018; Stensgård et al., 2019). This includes leftovers from, in particular, lunch and dinner, and occurs often due to households cooking more than they consume (ibid.). Table 1 below

illustrates what leftovers are wasted most, with cooked grains (i.e. rice, pasta), vegetables, and baked goods on top.

Table 1. Most wasted leftovers

Leftover Product	Amount
Rice/Pasta	25%
Vegetables	19%
Baked goods	18%
Potatoes	16%
Meat	11%
Unsure	6%
Fish	5%

Source: Adapted from Stensgård et al. (2019)

2.2.4 Why Food Waste Occurs

The literature on the occurrence of food waste in households is limited, and the findings are divergent depending on the methodology and theoretical background of the studies. Stensgård et al. (2019), found that most food waste deriving from private households occurred due to the food being neglected. Another study concluded that food waste occurs because households often buy groceries they are already in possession of, often causing these products to spoil before being able to use them (Schanes et al., 2018). Conrad et al. (2018) state that this is due to the consumers lacking knowledge on how to properly prepare and store fresh produce, causing them to spoil prior to intended usage.

Aschemann-Witzel et al. (2018) found that expiration date and visual imperfections (i.e. odd shape or colour) were the main reasons for food waste. Their study also found that socioeconomic characteristics, values and attitudes of the household influence the amount of food wastage. Schanes et al. (2018), on the other hand, found that socioeconomic factors do not play as a predictive role in amounts of food waste as expected. According to Quested et al. (2013), consumers are often not aware of how their behaviours and practices generate food waste, as these practices are so deeply integrated into everyday routines. They found that food

waste occurs due to cultural, social and temporal aspects which determine whether an individual perceives the food as edible or not (Quested et al., 2013).

2.3 Approaches to combating food waste

In the literature reviewed, the commonly suggested solutions to food waste cover three themes: public policies; technological- and marketing approaches; and individual measures. Due to the limitations of this background section, only a few approaches from a small portion of the literature on the topic will be discussed.

2.3.1 Public Policies

Public policies can be a great tool towards decreasing food waste, for instance, through implementing laws on waste and financial incentives towards decreasing waste. According to Aschemann-Witzel et al. (2018) and Katare et al. (2017), financial incentives and monetary bonuses could cause people who are price conscious to decrease their food waste. Schanes et al. (2018) had similar findings, as their study found that their respondents felt guilt regarding the financial loss tied to their waste. Moreover, a proper waste management framework, such as having a separate bin for food waste, has been found to be a feasible solution for decreasing food waste, but only for locations that do not have proper waste management already. One study from the U.K. found that after introducing a separate food waste bin, about 8% of the respondents expressed that their food waste behaviour had changed their food waste behaviour completely, and 24% claimed they wasted less than before (Foley & Hilton, 2011).

Papargyropoulou et al. (2014) found that in order to reduce food waste from households, a waste management system must be introduced parallel to a prevention, re-use, and recycle programme, by preventing avoidable food waste through redistribution networks and food banks. Several studies suggest that implementing a sharing economy, building on the idea of reuse, could help decrease food waste (Falcone & Impert, 2017; Richards & Hamilton, 2018). A sharing economy is the idea of moving from a traditional linear economy towards a "consumers shar[ing] access to assets" (Falcone & Impert, 2017:201). These studies suggest that through a sharing economy, all surplus food, from manufacturers, grocery stores, and

consumers, could be donated or recycled towards animal feed or energy creation. However, they also conclude that despite the potentials of a sharing economy, the correlation between the two cannot be taken for granted, and the implementation of a sharing economy through food sharing practices do not automatically lead to food waste reduction (Morone et al., 2016; Falcone & Impert, 2017; Richards & Hamilton, 2018).

2.3.2 Technological- and Marketing Approaches

Technological advancements can help people reduce their food waste, through mobile apps, smart-home assistance, and websites designed to assist people with planning. One study found that a fridge-camera keeping an overview of food items, their expirations dates and quantity, working as a smart-home assistant, could help the participants decrease their waste as it reminded them of the products they were in possession of (Ganglbauer et al., 2013). Another study found that a mobile app, where one can track their food-wasting patterns by logging what kind of items they throw away, the context and occurrence connected with the wastage, can help reduce household food waste (Ganglbauer et al., 2015). However, this study concluded that it was not directly the app that caused the participants to reduce their food waste, but rather, that the app sparked reflections among the participants regarding their waste- habits and intentions, causing them to over time change their waste behaviours. Similar findings were reported by the study of 'fridge-cameras' by Ganglbauer et al (2015). Moreover, Aschemann-Witzel et al. (2018) suggests that utilising an app could help the people who were cooking-involved and spontaneous to reduce their food waste, as it would help them keep track of their habits and give an overview of their groceries.

Marketing is an important instrument that is mentioned frequently in the literature on approaches towards decreasing food waste. It was found that utilising marketing tools, through macro- and micro-marketing interventions, could be a feasible measure towards reducing consumer waste, such as food waste (Ganglbauer et al., 2015; Calvo-Porral et al., 2017; Aschemann-Witzel et al., 2018; Schanes et al., 2018). Through campaigns reminding consumers of the cost of consumer waste, both financial and environmental, could nudge consumers towards 'better' behaviour. Aschemann-Witzel et al. (2018) found that through such campaigns, many of their respondents reported being reminded of their feelings of guilt and anxiety in relation to food waste, causing them to change their in-store behaviours (i.e.

buying less products, less spontaneous purchases). Other marketing approaches that were deemed feasible were to remove sales promotions as “pay for two, get three” and remove date labelling on non-perishable foods (Calvo-Porral et al., 2017). Schanes et al. (2018) also concluded on the importance of removing expiration dates and prohibiting sales promotions such as the aforementioned one, in addition to running food waste awareness campaigns aimed at consumers. They found that despite most food waste coming from private households, much of the waste occurs due to provocations by upstream actors (grocery stores, distributors, etc) through poor manufacturing (i.e. non-resealable packaging, imprecise date labelling), and many of the solutions must therefore be put in place by these actors.

2.3.3 Individual Measures

As most of the food waste occurs at the level of private households, it is natural that there must be individual measures implemented as well. However, studies have found that integrating personal changes or individual measures are more difficult than the above approaches, as it mostly requires the households to be interested in reducing their food waste (Aschemann-Witzel et al., 2018; Schanes et al., 2018). These studies found that the households that were environment-conscious or involved with reducing their food waste, were more likely to implement personal changes, such as freezing fresh produce prior to its expiration, utilising expired dairy products in baking, or using leftovers to make new meals. Evans (2012) discussed similar approaches, however, found difficulty in inspiring non-food-waste-interested individuals to reduce their waste.

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Chapter 3: Theory

Relevant theories and the theoretical framework

This chapter outlines relevant theories and concepts and presents a framework used in the analysis. They are tools used to comprehend the different dimensions of household food waste and the attributing factors and help answer the research questions outlined in the introduction chapter. The framework presented here is developed by CICERO through the ACT-project. It integrates several theories of human action, such as institutional theory and social psychology. In addition to these theories, I expand by including concepts and ideas from practice theory. However, only parts of the original ACT-framework and practice theory are relevant for this thesis, and therefore, only the elements that are applicable will be discussed in this chapter. Moreover, in order to be as coherent and organised as possible, I will begin with discussing the pertinent concepts derived from social psychology, institutional theory, and practice theory. Lastly, I will present the theoretical framework and its concepts.

However, it must be noted that when examining why food waste occurs, it is not enough to only look at the wasting in itself, but how the theories explain such behaviour. The below presented theories have been chosen in order to understand food-wasting attitudes and behaviours. Also, the studies on household food waste presented in the previous chapter all used the theory of planned behaviour (TPB) when examining food-wasting behaviours. The

ACT-project and my research are to a greater extent based on the combination of three theories and another social psychology focus than TPB. In order to contribute to the studies on household food waste, my research is analysed differently than the previously mentioned studies on this phenomena.

3.1 Social Psychology

In social psychology, there are different ideas surrounding how to understand individual choices, and what affects human behaviour. In essence, social psychology looks at how the individual acts out towards society, and how society influences the individual. The focus lies mainly on the kind of processes that influence and are a part of individual decision making. When trying to explain behaviour and attitude related to an individual's decision-making process regarding environmental issues and climate change, the work of Schwartz (1977) has often been employed. Schwartz proposed the Norm Activation Model (NAM) in order to explain altruistic, prosocial-, and 'environmentally friendly' behaviour. In the NAM, where values and norms are emphasised as the main driver of human behaviour, 'environmentally friendly' behaviour is perceived to follow from personal norms reflecting "*feelings of moral obligation to perform or refrain from specific actions*" (Schwartz & Howard, 1981:191). Schwartz found that moral considerations are the basis of pro-environmental behaviour, and that altruistic behaviour is affected by feelings of moral obligation to act on one's personally held norms. He established that an individual's personal norms form the core of the model, as illustrated in Figure 2.

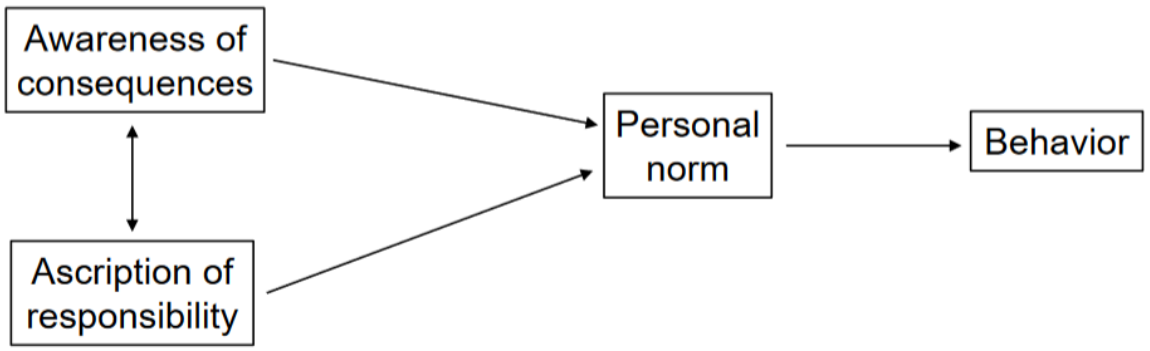

Figure 2. The Norm Activation Model

Source: Schwartz (1977)

According to the model, the variables activating the personal norms of an individual are: awareness of consequences and ascription of responsibility (Steg & de Groot, 2010). Awareness of consequences (AC) refers to what extent the individual is aware that their behaviour will hurt others (i.e. not prosocial or 'environmentally friendly'). The ascription of responsibility (AR) refers to the individual's "*reflecting feelings of responsibility for negative consequences of not acting prosocially*" (Steg & de Groot, 2010:725). Later models have also added the variable of efficacy and ability, such as the adjustment made by Steg and de Groot (2010).

Schwartz highlights the importance of personal norms as the model predicts individual behaviours based on these norms. He also highlights two processes that occur during an individual's altruistic or prosocial behaviour: i) activation of social expectations; and ii) activation of personal norm. Among these two processes, the second process, activation of personal norm (self-expectations), is the one with the pure altruistic motivation. Moreover, if personal norms are activated one can assume that the individual is aware of the consequences, and, either an already established personal norm, or moral obligation leads to the individual's behaviour. Thus, the behaviour occurs based on the assessment of cost and likely outcome. Overall, in his work, Schwartz explains that our individual values play an immense role in decision-making that deals with collective problems or moral implications. Values can refer to something an individual finds important, useful to life, or basic principles of behaviour or judgement which one follows. It affects how we assess different situations, consequences and choices in our everyday lives. Values also impact our choices, beliefs, and desires, and they often differ from individual to individual (Steg, 2016).

Several authors within the field of social psychology were influenced by the work of Schwartz. The value-belief-norm (VBN) framework by Stern et al. (1999) builds on Schwartz' work (such as the NAM) and the 'New Ecological Paradigm' (NEP) developed by Dunlap and van Liere (1978). The latter was created to predict environmental activism. The VBN framework states that a person's actions, in addition to their understanding of the consequences of their actions, will activate personal norms, which further influence future behaviour. The model assumes that the relationship between values, beliefs, norms and behaviours are elements of a casual chain. The VBN framework was created not only due to

the inspiration from NAM and NEP, but also to increase explanatory power (Stern et al. 1999). As illustrated in Figure 3, the casual chain towards pro-environmental behaviour, such as activism or policy support, consists of five variables: values (self-transcendence; self-enhancement; tradition; and openness to change); the NEP; awareness of consequences (AC) ; ascription of responsibility to self-beliefs (AR); and personal norms.

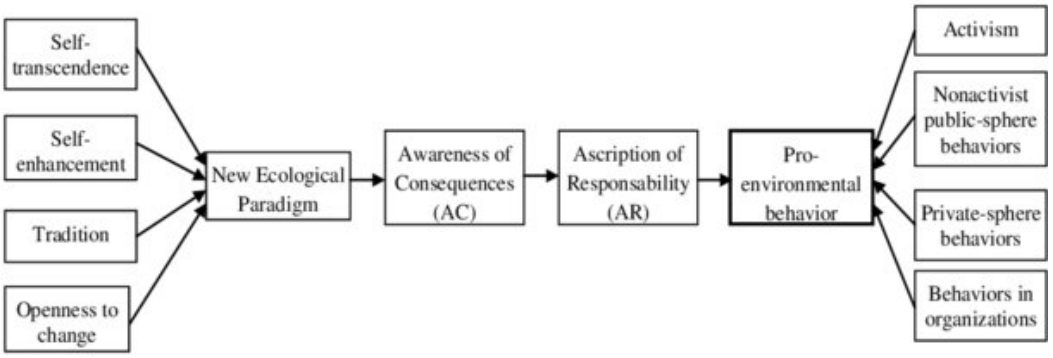

Figure 3. The Value-Belief-Norms Framework

Source: Stern et al. (1999)

In the VBN framework, values are looked upon as outcomes that directly influence how individuals act, formulate, and structure environmental beliefs (Schwartz, 1992; Stern et al., 1999; Stern, 2000). The framework explains that our values are followed by beliefs regarding human dependencies on nature, as defined by the NEP. These beliefs and values can then lead to AC, followed by AR and activation of 'environmentally friendly' behaviour. The framework explains that these beliefs and values can result in different forms of behaviour like activism, non activist publish-sphere behaviours, private-sphere behaviours, and behaviours in organisation.

3.2 Institutional Theory

In institutional theory, the emphasis is largely on social processes and how these form the individual and influence action. Institutions are understood differently in different fields, where the political science disciplines tend to include organisations into the concept of an institution. In sociology, anthropology, and economics, institutions are more typically understood as rules (Vatn, 2006). In the latter case, there is a difference between those adhering to an individualist or social constructivist approach. The difference between the two is that social constructivists believe that human behaviour is also based on social rationality,

while individualists believe that behaviour is based only on individual rationality (Vatn, 2006). In addition, there are differences in opinion whether social processes also affect individual preferences (Vatn, 2015).

It is furthermore beneficial to clarify the institutional context by defining institutions. According to Arild Vatn (2015), institutions are "*the conventions, norms, and formally sanctioned rules of a society*" (Vatn, 2015:78). Institutions form us, are socially constructed, and "*provide expectations, stability, and meaning essential to human existence and coordination*" (Vatn, 2015:78). Institutions both influence us and are influenced by us. Within institutions we have: conventions, which simplify behaviour by establishing specific acts to different situations (i.e. way of greeting); norms, which tells us how we should act (i.e. it is normal to greet); and formally sanctioned rules, which are the legal rules that make up society (i.e. stealing is illegal). Institutions can emerge from a personal or social level, but usually these behaviours appear from social context, and individuals are often unaware of the origin of these institutions. They can appear through the social construct that we learn during our upbringing, and are structured through human interaction, which forms us and teaches us what is meaningful or expected to do. However, due to the globalised world, we often interact with different cultures and subcultures that have norms which we do not internalise. It can therefore not be assumed that we internalise all norms we interact with (Vatn, 2015). In institutional theory, norms are therefore divided into internalised and non-internalised norms. This is similar to what social psychology refers to as social- (non-internalised) and personal (internalised) norms. We internalise norms which are a part of the society we grew up in or are living in, and we begin accepting and acting according to the societal rules.

Institutionalists seek to understand individual decision-making by looking at an individual's values, internalised- and non-internalised-norms and habits, and trying to understand how social processes can influence these individual factors (Berger and Luckmann, 1967; March and Olsen, 1989; Scott, 2014). However, how individual behaviour originates, and whether it is fixed is debated. It can be argued that human behaviour originates from our 'class habitus' and that the society one lives in influences human behaviour (Bourdieu, 1995; Giddens, 1991). According to Vatn (2015), it is essential to view human behaviour as something which moves between being reasoned and being automated.

3.3 Practice Theory

There is no "unified approach" for practice theory, and the theory in itself is often referred to as a "loose thought" rather than a structured theory (Schatzki et al, 2001:2 and 13). In essence, practice theory looks at the extension of what a behaviour is a part of - a behaviour is not an individual action, but rather part of a set of actions. There are different factors and concepts that different theorists within practice theory focus on. Authors such as Shove and Pantzar (2005) focus on the different elements that constitute a practice, while authors such as Warde (2005) and Schatzki (2002) rather focus on the connections between these factors. In spite of this, most of the authors believe that individuals themselves do not play an immense role in affecting practices, but that individuals rather just act on already developed practices (Hargreaves, 2011; Røpke, 2009; Shove, 2005). Social theorists are therefore more concerned about the underlying elements, such as traditions, artefacts needed and people's skills, which cause different practices.

The theory is traced back to Anthony Giddens' theory of structuration (1984). In contrast to the belief of current practice theorists, this theory discusses the reciprocal impact individuals have on social structures - where individual actions are shaped by social structures, and the actions are also shaping the structures. However, most of the theorists are concerned about the elements, or factors, that are subconsciously affecting practices (Schatzki et al., 2001; Warde, 2005, Hargreaves, 2011). Practices are usually analysed as single entities in themselves, or collections of performances (Neuman, 2018). As an entity they are viewed as something which exists and in relation to other practices, and as a collection of performances it is viewed as practices individuals participate in (ibid.). Reckwitz defines a practice as "*a way of cooking, of consuming, of working [...], which cannot be reduced to any one of these single elements. Likewise, a practice represents a pattern which can be filled out by a multitude of single and often unique actions reproducing the practice*" (2002:249). A practice cannot "live" by itself and is interdependent on other practices involved (Neuman, 2018). Practices can change by time through elements such as individual resistance, creativity, and new technologies (ibid.).

Moreover, it was Warde (2005) that began applying the practice theory to the study of consumption, by stating that consumption is caused by socially meaningful practices. In

terms of applying the practice theory to studies on consumption and food waste, it was mostly utilised as a critique of the theories of individualism heavily utilised in the studies on consumer behaviour. This critique occurred from many authors in the field having a cynical view of consumption, and in essence reducing the consumer to a pawn who has no individual preferences or choice (Neuman, 2018).

3.4 Theoretical Framework

After having discussed the relevant theories and concepts, the theoretical framework can be presented. The framework, which is illustrated in Figure 4**,** is an adapted version of the original ACT-Framework. The adapted framework integrates social psychological, institutionalist, and practice theory perspectives. I have omitted some variables that were in the original framework, and in turn, added other variables of interest instead. For instance, I have excluded the variable of 'individual values' in level 1 and will rather use the 'norm' variables when examining personal values through a different approach. Moreover, the original ACT-Framework does not include concepts deriving from practice theory, however, I have chosen to include it as behaviour (the act of wasting food) in this thesis is looked upon as a practice. I will look at a set of behaviours through a practice theory scope, by examining the food-wasting behaviour as a part of a series of habits. All the above-mentioned theories refer to the concept of habit, and to understand food-wasting, we must examine the behaviour as a set of habits and practices - not just one individual habit.

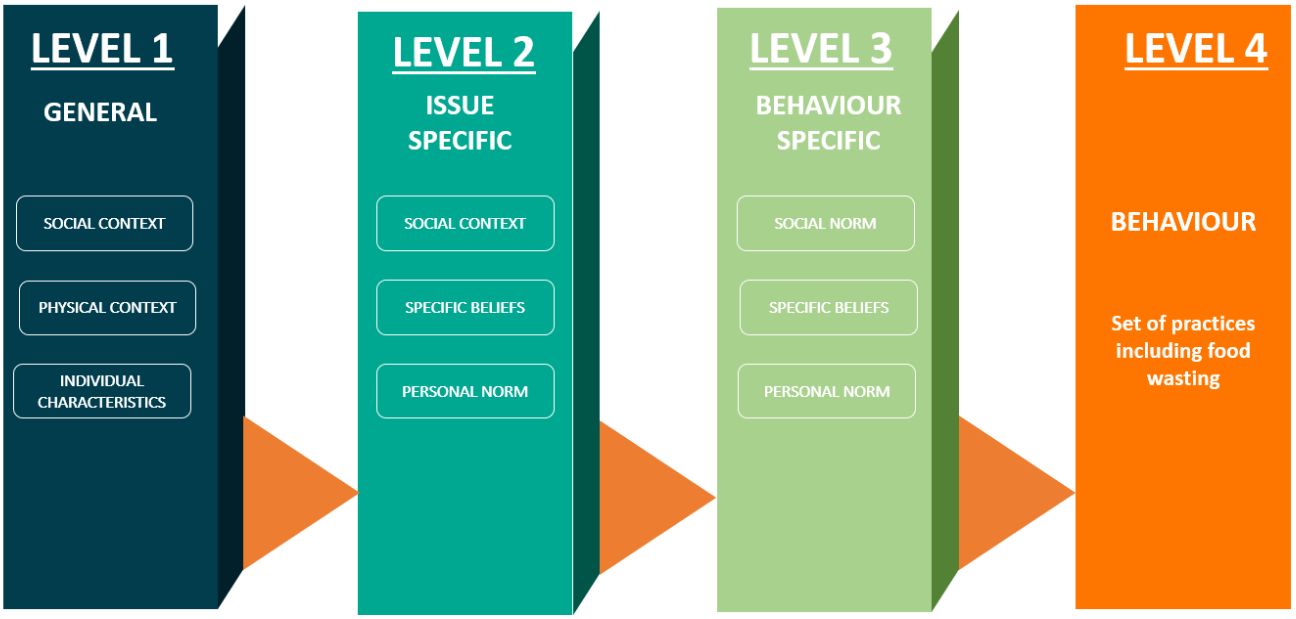

Figure 4. The Adapted Theoretical Framework

Source: Based on the ACT-project framework

The framework consists of the four levels that are believed to influence behaviour, moving from the general to the more specific factors. Regardless of the arrow's direction in the framework, it is important to note that there can be feed-back between the levels - for instance that an individual's food waste beliefs can influence their climate change beliefs (Schwanen et al., 2012). This is essential for the data analysis later on in this thesis, as feedback loops and differences in influential factors can occur.

The first level consists of general factors that are believed to influence an individual's behaviour. These factors include social context, such as place of living; physical context, such as distance to grocery store; and individual characteristics, such as age and occupation. Assumingly, factors in level 1 will influence an individual's behaviour, however, mostly indirectly. The second level consists of more in-depth issue-specific factors regarding, in this case, the individual's ideas about climate change and its effects. These factors are: social context (whether climate change is discussed among friends and family); specific beliefs (whether the individual believes in climate change and its consequences); and personal norm (the feeling of individual responsibility when it comes to reducing emissions and voting for pro-climate parties). It is also assumed that the factors in level 2 are indirectly affecting behaviour.

The third level consists of behaviour specific factors, meaning factors that deal directly with the individual's food waste habits and norms. In consists of these factors: social norm (whether food waste is discussed among family and friends and how the individual's social network approaches food waste); specific beliefs (whether food waste affects the climate); and personal norms (whether the individual feels responsible for reducing their own food waste and if this is important for them). The third level is assumed to be directly tied to the behaviour of an individual, meaning what an individual thinks about food waste should reflect their food waste behaviour. The fourth level - the 'dependent variable' - consists of the individual behaviour, such as how much food the individual wastes and what kind of products they tend to waste.

The original ACT-framework was initially created to study climate relevant behaviours like choice of transport mode or red meat consumption, and how behaviours might change over time. In addition, the framework was created based on the assumption that in order to reduce climate change, societal engagement fostering changes in norms for climate relevant practice is key. Food also has effects on climate change and therefore, I find the framework useful for analysing the research questions of this thesis. In terms of food waste - the framework may be useful when trying to explain why private households waste food, as it explains the same phenomena through different perspectives - thus being able to further research how to change these behaviours. The integration of theories allows for a widening of aspects included in the analysis, and opens the opportunity for discussing the different interpretations of behaviour.

However, the integration of the different theories is not a straightforward process. The theories understand different concepts differently, such as norms and habits, and this has implications for my research as the findings can be interpreted differently based on contracting perspectives. Both social psychology and institutional theory, understands norms as being influenced by a form of external pressure from a community of people regarding what is expected or seen as normal behaviour. However, there are some differences. Social psychologists are not concerned with how norms occur, but are rather interested in how norms function, and tend to view norms as being affected by social pressure. Whereas institutionalists are interested in how norms both occur and how they function.

Institutionalists also tend to separate two kinds of norms, non-internalised and internalised. Institutionalists emphasize internationalisation of norms as a process where the social process affects the individual, while social psychology views internalisation of norms as a personal process influenced by individual characteristics.

Practice theory focuses on the interconnections that are internalised, which is similar to the concept of habit found in both social psychology and institutional theory. While institutionalists and practice theorists view habit as part of a process of identity formation through social constructs, social psychologists view habits as a construct fabricated by individuals (Schatzki et al., 2001; Schwanen et al., 2012). Practice theory rather emphasizes these processes as a part of practices that make up different sets of behaviors.

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Photo//freepik

Chapter 4: Methodology

Methods, Data Collection, and Limitations

This chapter describes the techniques for collecting and analysing data, as well as the methodological choices made prior to- and throughout the research process. This includes my choice of research strategy, design, and selection of research areas. In addition, the chapter encompasses the decisions connected to the interview and sampling approach, data analysis, ethical considerations, and further limitations and challenges.

4.1 Research Questions and Data Requirements

Prior to the research process, the research questions (*outlined in chapter 1)* were assessed in order to define what data was required to answer the respective objective. Four questions were outlined:

I. How much food waste is created from households with children?
II. Why are households with children wasting food?
III. Are the respondents from these households interested in reducing food waste?
IV. What kind of measures do the respondents from these households believe should be implemented to reduce household food waste?

Given the different kinds of research questions, a mixed-methods approach was needed. For the first RQ, quantitative data was needed to calculate the amounts of food waste. Qualitative data was also used to enrich the results regarding waste frequency. Both quantitative and qualitative data was required for the second RQ, which concerned people' attitudes and ideas regarding food waste. For the third and fourth RQs, qualitative data was deemed the most appropriate.

There is little mixed-methods research about the topic of household food waste in Norway, and the findings can hence be of interest to others who are engaged in this topic. Throughout the research process, I was also part of a project at CICERO, called ACT, which was relevant to this research topic. Through this project I was able to access primary raw quantitative data on household food waste habits in Norway, and the aim of this thesis was combining these results with qualitative data to answer said research questions. Additionally, comparing the different methods, also, in turn, improved the transferability of the research through data-triangulation.

4.2 Design and Methods

Following the initial definition of data requirements it was necessary to formulate a research design and choose methods for the data collection and analysis. According to Bryman (2012), a research design is how you will implement the research strategy, and how you will collect and analyse data. Research methods refer to what technique will be applied for collecting data (ibid.).

4.2.1 Design

To frame the data collection, a research design was needed. The design had to consider several elements, such as scope and strategy. According to Bryman (2016), there are four method designs that can be utilised when undertaking a mixed-methods research: exploratory sequential design; explanatory sequential design; embedded design; and convergent parallel design. The quantitative data collected by CICERO (from here on out referred to as the ACT-data) already followed a predefined methodology, and therefore the design and methods for the qualitative data were affected by this. Since I was already in possession of the quantitative data and had this data affect the formulation of research questions, an embedded

design was the most feasible for this research. This design refers to having one form of data, quantitative or qualitative, play a supporting role to the other form of data. In this case, the qualitative research draws on a smaller element of the quantitative method.

For the quantitative data, I analysed the ACT-data. The ACT-project is the first in Norway to track Norwegian's attitudes and actions in response to climate policy instruments through scientifically based survey tracking. The project receives funding from the Norwegian Research Council and the respondents are recruited through Kantar population panel. Since 2018, the project has surveyed and tracked 4000 respondents annually on their beliefs, values, and actions regarding climate change and contributing factors (Aasen et al., 2019). In this thesis, the data collected in 2018 will be utilised. Moreover, I found it useful with in-depth semi-structured interviews in order to examine the respondent's attitudes and behaviours regarding food waste and climate change. In-depth interviews were deemed the best approach for exploring the diversity of perception, behaviour and beliefs on food waste as well as it complemented the findings of the ACT-data. Thus, along with the quantitative data, the design includes interviews through an in-depth study which I chose to have in a defined geographical area (see section 4.3).

4.2.2 Methods

Following the decision of an appropriate research design, the choice of methods for collecting the data came next. The ACT-data was collected through a web-based survey, by Kantar, a market research company. Kantar has an ISO certified standing panel which they contact to participate in surveys, such as for the ACT-project.

For the qualitative data, I aimed at interviewing several individuals simultaneously through semi-structured interviews. In semi-structured interviews, the researcher follows an interview guide with questions or specific topics one should cover (Bryman, 2012). This kind of interview form allows researchers to ask relevant follow up questions, as well as collect all data needed to answer the research questions (ibid.). In addition, I predefined concepts and questions in the interview guide which allowed for a structured and efficient coding, which was necessary due to the time constraints and scope of this thesis.

4.3 Choice of Study Area

The chosen study site was the municipality of Ringerike[1], which is located about an hour north-west of Oslo (Fig. 6). Ringerike was chosen due to prior knowledge about the area, in addition to a good network. I was born and raised in this municipality, and therefore have thorough knowledge on the local culture and society. The city of Hønefoss functions as the center of the municipality and the town gained city status in 1852. According to SSB, the city of Hønefoss has approximately 16,000 inhabitants, while there are about 30,000 inhabitants in all of Ringerike municipality (SSB, 2021a). About 22% of the households in the municipality have children under the age of 18 (SSB, 2021a).

Figure 5: Map of Ringerike municipality within Viken county.

Source: Google Maps (2021)

The municipality is a medium-sized urban municipality, and is an important traffic hub for cars, trains and busses. Europavei 16 (main road to Bergen), Bergensbanen, Randsfjordbanen, and Roalinjen meet here. The agriculture and forestry sectors account for 24% of the jobs in the municipality (SSB, 2021b). Ringerike is the largest agricultural and forestry municipality of the former county Buskerud (which was merged together with other counties to create Viken on 1 January 2020). Ringerike is especially known for producing potato and peas which are distributed and sold all over the eastern part of Norway. The most important industries have traditionally been wood processing and concrete production.

[1] See Appendix 2 for more information about Ringerike

4.4 Sampling Approach

In this section I will discuss the sampling approach by describing the sampling criteria, the approaches utilised, and the final sample. I will do so by first presenting the sampling approach for the quantitative data, and second, by presenting the approach for the qualitative data.

4.4.1 Quantitative Data

Kantar sampled participants through their standing panel. The panel is a pre-recruited sample of people over the age of 18 who are willing to participate in surveys. The panel amounts to approximately 38,000 people, and participants are randomly recruited through telephone and postal surveys. For the ACT-project in 2018, Kantar contacted around 10,000 residents of Norway during May and June of 2018 regarding the survey, where 4339 responded. The respondents were selected and sampled through an interactive procedure, in order to secure a representative sample of the Norwegian population, 18 years and older, in terms of age, gender, education, and geographical distribution (Aasen et al., 2019). A random half (N = 2073) were asked questions about behaviour-specific habits regarding food waste.

4.4.2 Qualitative Data

The sampling criteria for the qualitative data were predefined during the delimitation of the scope of this thesis and when starting the sampling process, I had three criteria: (i) the respondent must have one or more child(ren) under the age of 18; (ii) the respondent must be the one fully or partially responsible for the grocery shopping and cooking in the household; and (iii) the respondent must live in Ringerike.

The sampling of respondents began in the beginning of December 2020 and ended mid-January 2021. The respondents were selected through convenience sampling, and I collected the respondents through the internet. I created a survey on Nettskjema with information regarding the project, where respondents who wanted to join could sign-up. In this survey[2], I added control-questions in order to assure that those signing up fit the sampling criteria. Next, I contacted high schools, elementary schools and kindergartens in the

[2] See Appendix 3 for survey [In Norwegian]

municipality. I sent them all an email[3] with a small summary of the project, a link to the survey, and asked whether they would be interested in helping by forwarding the information to their employees and/or parents. 10 out of 40 schools and kindergartens responded and about 8 individuals signed up through the survey. Next, I published a post[4] regarding the project with a link to the survey on the Facebook page 'For sale Hønefoss and Ringerike' [kjøp og salg Hønefoss og Ringerike], a group with 28,000 members. Simultaneously, I had an interview[5] with the local newspaper 'Ringerikes Blad' regarding the project and how those interested in joining could contact me. In the end, I had 18 individuals signed up through the survey and 5 individuals who had emailed or called stating their interest in joining.

The final sample consists of 20 individuals - 12 women and 8 men. Table 2 (see next page) gives an overview of the respondent's individual characteristics with regards to gender, age, relationship status, amount of children under the age of 18, and occupation.

[3] See Appendix 4 for email [In Norwegian]
[4] See Appendix 5 for Facebook-post [In Norwegian]
[5] See Appendix 6 for NewsPaper Article [In Norwegian]

Table 2. Overview of the respondent's individual characteristics

Respondent number	Gender	Age	Relationship status	Amount of children under the age of 18	Occupation
1	Female	49	Married	2	HR-specialist
2	Female	26	Single	1	Unemployed
3	Female	49	Single	2	Police officer
4	Female	47	Married	2	Accountant
5	Female	37	Married	2	Social worker
6	Female	31	Married	2	Teacher
7	Female	43	Married	3	Scientist
8	Female	36	Married	2	Therapist
9	Female	47	Partner	2	Unemployed
10	Female	48	Married	2	Teacher
11	Female	47	Married	2	Senior advisor
12	Male	41	Seperated	2	Nurse
13	Male	50	Single	2	HR-specialist
14	Male	39	Partner	3	Investment banker
15	Female	47	Married	4	Senior advisor
16	Male	50	Partner	1	Social worker
17	Male	36	Partner	1	Police officer
18	Male	42	Partner	2	Railroad conductor
19	Male	30	Partner	2	Teacher
20	Male	28	Partner	1	Teacher

4.5 Data Collection

In this section, I will present the process of data collection for both the quantitative data, and the qualitative data respectively.

4.5.1 Quantitative Data

The ACT-data survey addressed behaviours, perceptions, attitudes, and norms that are relevant towards the transition of a low-emission society. The survey consists of questions on the following, but not limited to, topics: the population's perception of climate change; their attitudes to policies to reduce GHG emissions; their behaviours, attitudes, and norms, and how they perceive it; and what are the respondents willing to change.

Initially, the plan was to utilise data from the three years the survey has been conducted, however, I was only able to utilise the data collected in 2018 due to missing variables regarding households with children in the datasets from 2019 and 2020. In the 2018-survey, respondents were asked various questions about their life, individual characteristics, and activities from the previous year (2017). From the data collected, I used data regarding individual characteristics and data regarding food waste frequency. The question regarding food waste frequency was worded "approximately how often do you waste (more than 100grams) of these food items? (for instance, due to leftovers, expiration date, reduced quality)". The respondents were asked to rank how often (answer alternatives: daily; every-other-day; 1-2 times a week; a few times a month; seldom; and never) they wasted these food items: drinks (milk, juice, etc.); baked goods; dinner/warm meals; and fruit/vegetables.

4.5.2 Qualitative Data

For the interviews I followed an interview-guide. The guide contained questions regarding the topic, in addition to follow-up questions. It was created based on the concepts of the adjusted ACT-framework and the factors within the four levels of the theoretical framework. The interview-guide was reviewed by my supervisor and tested on three different occasions before it was used. The questions followed a specific structure and the respondents were asked the questions in the same order. The complete interview-guide can be found in Appendix 1. The

fieldwork was in January and February 2021. During these weeks, I conducted, transcribed and coded all interviews simultaneously. The initial plan was to conduct them all in person, which I did with the first four respondents. However, due to the outbreak of the mutation virus in Nordre Follo and Ås in the beginning of February 2021, the rest of the interviews were conducted through phone calls/Skype/Zoom/Teams.

Twenty interviews were conducted with an average duration of 58 minutes. The interviews began with questions about general individual characteristics, such as age, occupation, and amount of children under the age of 18[6]. Following, I asked questions regarding their current and future food waste behaviour, including questions on the usage of a shopping list, the kinds of food they usually throw away, how much food they waste, and what would motivate them to reduce their personal food waste[7]. They were further asked questions regarding their behaviour specific social- and personal norms, such as if the topic of food waste is discussed at home, how people in their network deals with expired food, and whether they feel a personal responsibility to decrease their food waste[8]. Next, I asked questions regarding behaviour-specific- and issue-specific-beliefs, such as whether they believe food waste is affecting the climate and if they believe in climate change[9]. In order to find out whether food waste and climate change were important topics to the respondents, they were asked about their personal values - such as whether it is important to them to protect the environment, and if climate change is an important topic for them[10]. Lastly, to get a sense of their issue-specific personal norm and social context, they were questioned on their feeling of personal responsibility to support reduction of GHGs and whether they discuss climate with friends, family or colleagues[11]. It is important to note that the respondents were asked again, at the end of the interviews, regarding their food-wasting behaviours and whether they wanted to adjust the quantity they had initially given. Three of the first respondents mentioned an adjustment in frequency naturally at the end of their interviews, and to not have any inconsistencies in the data, I chose to ask all the respondents about this.

[6] Question 1, 3, and 6.
[7] Question 30, 38, 39, and 44.
[8] Question 26, 28, and 29.
[9] Question 25 and 21.
[10] Question 14 and 17.
[11] Question 24 and 18.

The first four interviews took place at the public library in Hønefoss. It is recommended that interviews are conducted in a place where the respondent feels comfortable (Bryman, 2012), and I selected this location as I wanted to create a neutral, comfortable environment. As 16 of the interviews were conducted through digital means, I was not able to ensure the comfortableness of the location for all the respondents. Most of the respondents were at home during the time of the interview, and they mostly took place after the children had gone to bed. Thus, one can assume that they were comfortable.

The respondents were allowed to decide what kind of platform they wanted to use during the interview. I did so in order to remove something which could have become a stress factor for the respondent. Most of those working in public institutions (such as the teachers, senior advisors, and social workers) were familiar with the use of Microsoft Teams, therefore this was the preferred platform for these respondents. For the other respondents, Skype and Zoom were used equally. Three of the respondents did not want to talk over video chat and preferred having the interview by phone call. All the sessions were recorded. Prior to the interviews, I asked the respondents permission to record the session. I only recorded the voice of the respondents, not the faces, and used the recordings to transcribe and code the sessions. This was all in line with the guidelines provided by the Norwegian Centre for Research Data (NSD), which will be discussed more thoroughly in section 4.7.

4.6 Data Analysis

In order to analyse and interpret the data collected, through both quantitative and qualitative measures, the amount of data must be reduced and summarised into figures, tables, and textual material (Bryman, 2012). I will in this section present the way I analysed both types of data, starting with the quantitative data and ending with the qualitative.

4.6.1 Quantitative Data

The 2018 ACT-data consisted of 4081 observations from a representative sample of Norwegian households, as discussed in 4.4.1. However, as the focus of this thesis is on households with children under the age of 18, only 864 observations were relevant. I also excluded all the ‘do not know’ responses, as they were not relevant for answering the posed

RQs. As only 2% of the respondents answered 'do not know', removing them did not cause a statistical difference.

For RQ1, I used Excel to calculate the percentages of total amount of food waste for the four answer categories (drinks; baked goods; dinner/warm meals; and fruit/vegetables). Further, I created figures utilised in the analysis-chapter for this research question to give a better understanding through visualisation of the data. For RQ2, I used ordinary least squares (OLS) regression to estimate how individual characteristics of the household impact food waste, assuming that the dependent variable is cardinal. The analyses were performed in Stata[12]. I formulated my multivariate model as follows:

$$\boldsymbol{y = a + b_i + x_i + e_i}$$

where **y** is the dependent variable, in this case food waste frequency, **a** is the intercept, $\boldsymbol{x}_i$ is a vector of explanatory variables with parameters $\boldsymbol{b}_i$ and $\boldsymbol{e}_i$ is the error term, explaining the residuals from the regression (Field et al., 2012). The variables are specified in Table 3. These analyses were applied to test for statistical significance using a 5% significance level.

Table 3. Quantitative Coding Table

Variable name	Coding
Food Waste Frequency (4 food-categories)	Daily = 1, Every-other-day = 2, 1-2 times a week = 3, A few times a month = 4, More seldom = 5, Never = 6
Income (NOK)	1 = 200k or less, 2 = 200-299k, 3 = 300-399k, 4 = 400-499k, 5 = 500-599k, 6 = 600-699k, 7 =700-799k, 8 = 800-999k, 9 = 1 million or more, 10 = do not want to answer
Education	1 = primary school, 2 = high school, 3 = vocational training, 4 = university (until 4 years), 5 = university (more than 4 years)
Amount of children	2 = 1 child, 3 = 2 children, 4 = 3 or more children
Gender	1 = man, 2 = woman
Age	Numeric (just their age)

[12] The statistical programme utilised for the quantitative data

4.6.2 Qualitative Data

After conducting the interviews, I transcribed, coded and analysed the results. The process of transcribing involved listening to each interview-recording and writing down the replies of the informants. The transcriptions were further coded through a two-step-process, using both predefined and data-acquired codes. I used a thematic analysis to organise the data into key themes. These themes were chosen based on the theoretical framework, including themes such as behaviour, attitudes, and norms. These codes were further categorised with relevant quotations from the interviews.

For RQ1, the answers regarding the amount of food waste were transferred to Excel to create percentages and figures. For the first part of RQ2, I used the findings of the thematic analysis and relevant quotations. For the second part of RQ2, RQ3 and RQ4, I used the findings derived from NVivo[13]. I used this software to compare the different interviews, and analyse for similarities and differences. I was also able to note down different non-verbal expressions that I noticed while transcribing, as well as connect similarities between answers of the respondents. The non-verbal expressions I noted down were: tone of voice; how the interviewees responded and reacted to the questions (negative or positive comments); and any inconsistency in their answers. NVivo was helpful in the creation of archetypes (see below) and analysing the data in detail.

An archetype analysis was found to be a well-suited and efficient data analysis technique. Archetypes are recurrent patterns of attributes in social-ecological systems that often reappear in multiple cases (Oberlack & Eisenack, 2018). They are usually described as building blocks as it is unusual that every individual fits perfectly in one single archetype, and there are typically some (small) individual differences (ibid.). According to Eisenack (2017), an archetype analysis is beneficial as it helps you avoid being stuck between trying to analyse the data through "overgeneralization" or "every-case-being different". It is beneficial when analysing and discussing social or environmental issues, such as reducing household food waste, as it allows for the understanding of individual-archetype factors and solutions. Moreover, according to the theoretical framework, there are different underlying factors that lead to an individual's behaviour, and the archetype analysis makes it possible to look for

[13] A qualitative data analysis computer software

similarities between the different respondents. I used NVivo and thematic coding to create the archetypes. The archetypes were based on characteristics, answers and interest of the respondents. This analysis technique was utilised as it allowed for the development of archetype-specific solutions, as these became evident while interviewing the different respondents. The analysis of both the quantitative and qualitative data will be presented in its entirety in the next chapter, however prior to this, a remark regarding ethical considerations (4.7) and limitations and assessment (4.8) will be presented.

4.7 Ethical Considerations

To protect the respondents from any harm associated with the study, and to ensure integrity of the research, some ethical considerations had to be made. The research proposal, interview guide, and research summary was submitted to the NSD in autumn 2020 to ensure that the research would be within ethical standards. The project was approved by NSD with no alterations needed. During the sampling of respondents, all potential respondents were informed that data collected would be treated confidentially, that their information would only be utilised for this project, and that the project followed all data protection guidelines. I provided every respondent with an information form prior to the interviews regarding the project, what it means to take part of the project, and their rights as a respondent (Appendix 7). They were also informed that they could withdraw their consent at any time during the project, and that if they wanted, I would give them access to all the data I had saved regarding their participation. Before I began recording each interview, I asked the respondents whether they had read this document, if they had any questions, and whether they agreed to be recorded. When beginning the recordings, I asked them once more whether they agreed to participate and to be recorded, in order to also have their consent recorded. NSD states that the respondents can give their consent both in written form and orally, and since I wanted to keep the respondents anonymous I only recorded their consent.

To ensure further anonymity of the respondents while writing the thesis, I chose to not reveal any information connected to the respondents name, address, or specific work-place. The interviews were recorded using a recording device, and all recordings were saved on a separate password-protected harddrive that only I had access to. While transcribing, I emitted all personal data from the transcriptions, and transcripts were saved on a separate

password-protected memory stick. Each respondent was also given a personal code and number.

4.8 Limitations and Assessment

There are a few limitations and implications that must be considered, despite the justified methodological choices. According to Bryman (2012), limitations can be evaluated using validity and reliability through looking at four criterias: credibility; transferability; dependability; and confirmability. In order to evaluate the validity and reliability of this research, the following implications and limitations will be discussed: the case selection and sample size; the data collection; the analysis and translation; and possible research biases. As the ACT-data collected by Kantar on behalf of CICERO and I had no interference with the data other than analysing it, this section will refer to the qualitative data which I sampled, collected and translated.

4.8.1 Delimitations and Scope - Case and Sample Size

As this is a 30-credit thesis and set within the timeframe of one semester, there were delimitations made with regards to the scope of this research. The time-aspect brought forward a few limitations that must be taken into consideration, as it may have impacted the transferability of the research. The sample size of the qualitative data is relatively small and only from one municipality. The results can therefore not be generalised to the general population of Ringerike, nor to the general population of Norway. Nevertheless, the findings are relevant for the respective actors involved and the community of Ringerike. The results can also contribute to a better understanding of the food waste behaviour and attitudes of individuals in areas similar to Ringerike, despite not being able to draw a generalised conclusion.

4.8.2 Implication of the Qualitative Data Collection Method

There were also implications regarding the method of collecting the qualitative data, specifically regarding the usage of both physical- and digital interviews, and the use of predefined concepts. Firstly, with regards to the method of conducting interviews, there are some concerns regarding the observation. The initial plan was to conduct them all in person

and as mentioned, the first four interviews took place in person. However, given the circumstance of the covid-19 mutation outbreak, I had no other option but to conduct the rest of the interviews digitally. In turn, this was more time-efficient, and since the respondents chose the digital-platform , there was also less stress connected to the interviewing-process.

Secondly, I defined concepts, theories and a theoretical framework prior to the interviews, which provided a sense of direction to the interview guide and type of questions to ask. On the contrary, predefined concepts can alter the credibility of the research by linking the theory and results at an early stage. To combat this, I gave as little information as possible (and allowed by the NSD) regarding the theory and asked questions in an order that made it seem random. This, so the respondents would not alter their answers based on what they thought would be the "*right*" thing to say. However, the respondents did know the research was about food waste, and it can therefore be expected that some of the respondents tried to justify their answers or answered that they wasted less than what they in reality do. This is often referred to as social-desirability bias (see section 4.8.4).

4.8.3 Issues regarding the Analysis and Translation of the Qualitative Data

The analysis and translation of data can also have limitations which impact the results. First, all the interviews were conducted in Norwegian and following the interviews, I transcribed everything in Norwegian before I translated it to English. Thus, valuable information or insights may have been lost in translation. Secondly, I coded based on the English-versions of the transcriptions, which may result in similar limitations, especially in terms of both dependability and transferability. To ensure dependability, I kept the complete Norwegian transcriptions and cross-referenced the coding with the original transcriptions and recordings. To ensure confirmability, I frequently utilised quotes and provided context to the answers. Providing context proved important in this process, to ensure that the respondents' reality comes forward in the discussion.

4.8.4 Possible Biases

Although research should be free of biases and values, this is difficult to ensure, and proved a concern also in this research. Firstly, concerning the validity of the qualitative data was my relation to the case site. Since I am from Ringerike, I had to actively work to not sample

respondents from my own network and I was able to collect a sample that I deemed adequate for the research. Regardless, Ringerike is a small municipality, and several times the respondents did know '*of me'* for instance by having worked with one of my family-members. In turn, this did not appear to affect them much, based on the honesty of their answers throughout the interviews. Secondly, the issue of confirmation bias arised. As food waste is a topic that I am passionate about, I had to ensure that I did not favour or interpret data in a way that would support my own beliefs or values. Several considerations were made to ensure full objectivity, such as fully depending on the interview guide and randomisation of questions. I also had a few test-rounds of the interviews in order to gain feedback on my tone of voice and how to ask the questions as neutral as possible. Lastly, there may have been a possibility that respondents were subjected to 'social-desirability bias'. Meaning they would alter their answers to be viewed more favorably, or in a way that would "*please*" me or the research. This may have occurred when asking the respondents how much food they wasted, as many of them might have tried to over-report "good-behaviour" by saying they wasted a lot less than what they in reality might do. In order to limit the extent of this, I cross-checked many of the answers at the end of the interviews, when the respondents were usually a bit more open for sharing, and whether they wanted to add anything to their answers.

Photo//freepik

Chapter 5: Analysis

This chapter will present the analysis of the quantitative and qualitative data. The chapter is organised according to the research questions and is therefore divided following four parts: (i) the amount of food waste generated by households with children; (ii) why these households waste food; (iii) the interest for reducing food waste among these households; and (iv) measures the respondents believe should be implemented to facilitate reduced food waste from households.

5.1 How much food waste is created from households with children?

As emphasised in Chapter. 4 (method), both the ACT- and the interview-data will be used to answer RQ1. In order to calculate the food waste quantity, the respondents were asked to respond to the following statement: “approximately how often do you throw away (more than 100 grams) these types of food (e.g. due to leftovers, expiration date, reduced quality)?”. Response categories span from “daily” to “never”. The food-categories referred to drinks (soda, juice, dairy-products), baked goods (bread, pastries, etc), dinner/warm meals, and fruits/vegetables.

The ACT-respondents were only able to choose based on the options given. The interview-respondents were given the same option, but most of the respondents also gave several justifications and other comments regarding the amount of waste. I will in this section present in parallel the findings from the ACT-data and the interviews, through graphs, percentages, and direct quotations from the respondents. The analysis is presented in order of the four food-item categories: drinks; baked goods; dinner/warm meals; and fruit/vegetables.

5.1.1 Waste of Drinks

The figure (Figure 6) below depicts the distribution of waste frequency of drinks among the ACT-respondents. The X-axis shows the waste frequency options for each respondent, while the Y-axis depicts the percentage of respondents for each category (N=856). A majority of the respondents estimated themselves to waste drink-products more seldom than monthly or never. 25% of the respondents reported to waste drinks monthly, whereas 11% estimated themselves to do so at least weekly.

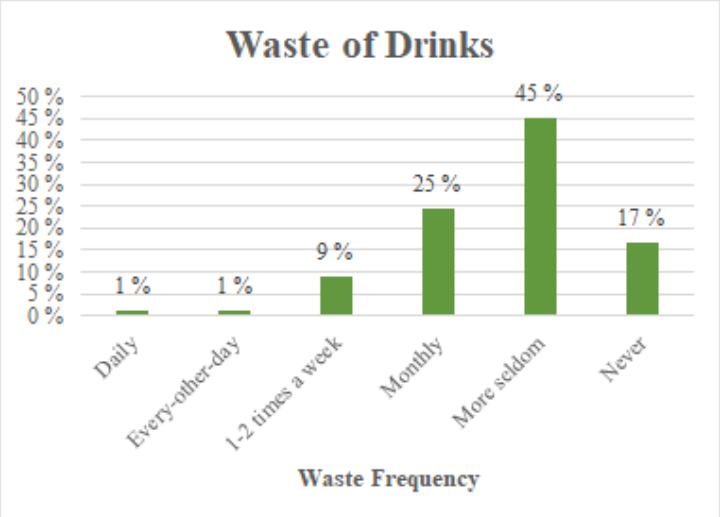

Figure 6. Waste of Drinks - In percentage per category.

Source: Based on ACT-data (N=856)

Figure 7, below, illustrates the waste frequency of drinks among the interview-respondents (N=20). None of the respondents reported to throw away drinks (soda, juice, milk, etc.) more often than monthly. 25% reported to do so monthly, while the rest responded that they did so more seldom or never. *"We are five people living in this household and we drink a lot of milk, so we never throw away any of that. But juice I would say we throw away a few times a*

month" (Respondent #7). Respondent #15 mentioned that they never throw away milk because "*it says on the carton 'best before but not bad after' so why would I throw it away"*.

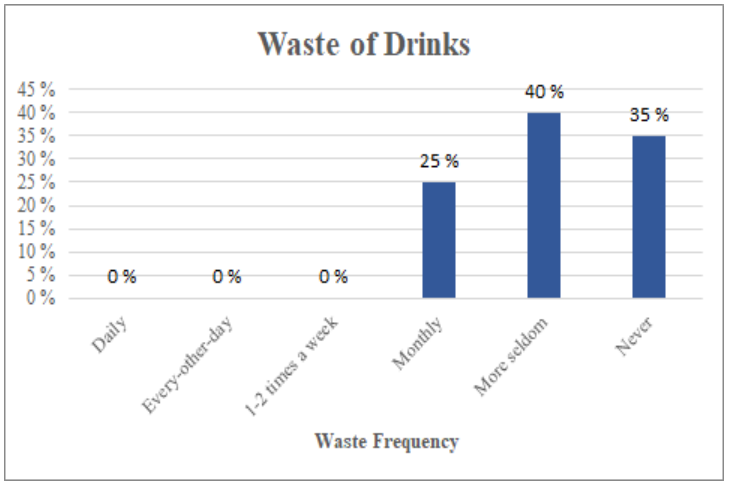

Figure 7. Waste of Drinks - In percentage per category.

Source: Based on Interview-data (N=20)

5.1.2 Waste of Baked Goods

Figure 8 illustrates the frequency of wasting baked goods among the ACT-data-respondents. About one-third of the respondents reported themselves to waste baked goods more seldom than monthly, whereas 6% said they never wasted baked goods. 35% answered monthly, while one-fourth of the respondents estimated to waste baked goods more often than weekly.

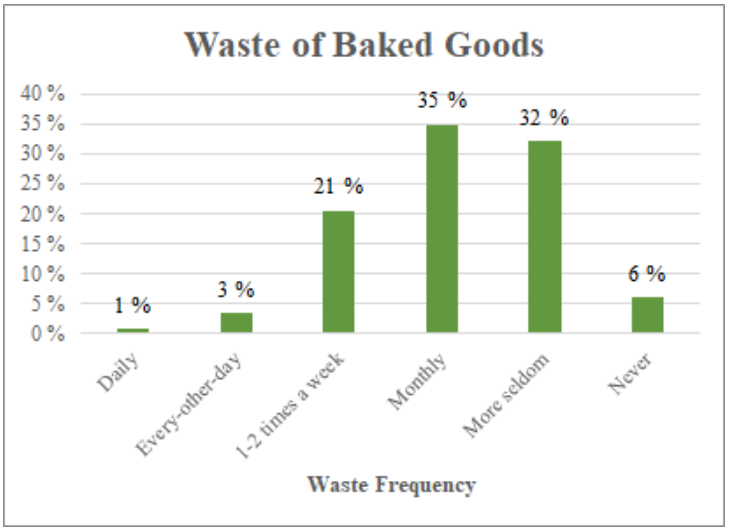

Figure 8. Waste of Baked Goods - In percentage per category.

Source: Based on ACT-data (N=837)

In the interview-data, 10% answered that they wasted baked goods daily, whereas 30% answered every-other-day or 1-2 times a week. Overall, the interview-respondents commented that bread was the item they threw away the most. "*We go grocery shopping a couple of times a week and then we buy new bread. So we usually throw away the bread that was already opened at home, especially if it is dry or there are only a few slices left"* (Respondent #14). This did not only occur for those respondents who used store-bought bread, but also for those who would bake themselves: "*I always bake my own bread and when I have freshly baked bread I will rather eat that than the old one. So yeah, the old one I throw away*." (Respondent #13). Nevertheless, 35% of the respondents reported that they wasted baked goods more seldom than monthly.

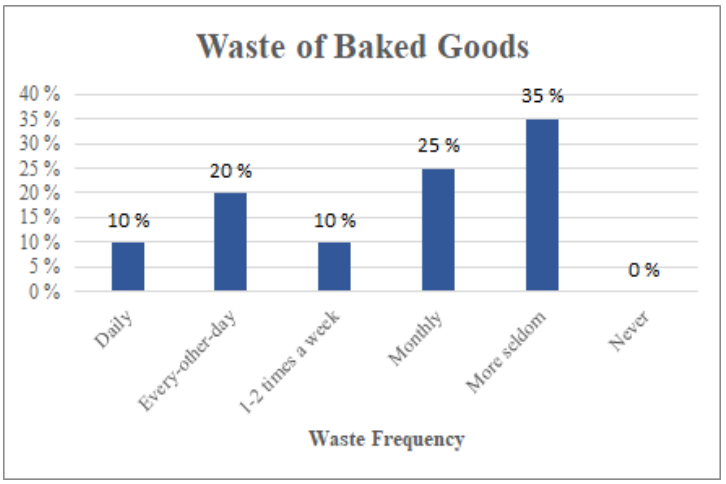

Figure 9. Waste of Baked Goods - In percentage per category.

Source: Based on Interview-data (N=20)

5.1.3 Waste of Dinner/Warm Meals

Figure 10 shows the distribution of dinner/warm meals-waste frequency among the ACT-respondents. The median waste frequency was monthly, while 39% of the respondents wasted weekly or more (1-2 times a week; every-other-day; or daily). Additionally, about 21% of the respondents reported to seldomly waste dinner or warm meals, whereas 7% reported to never do so.

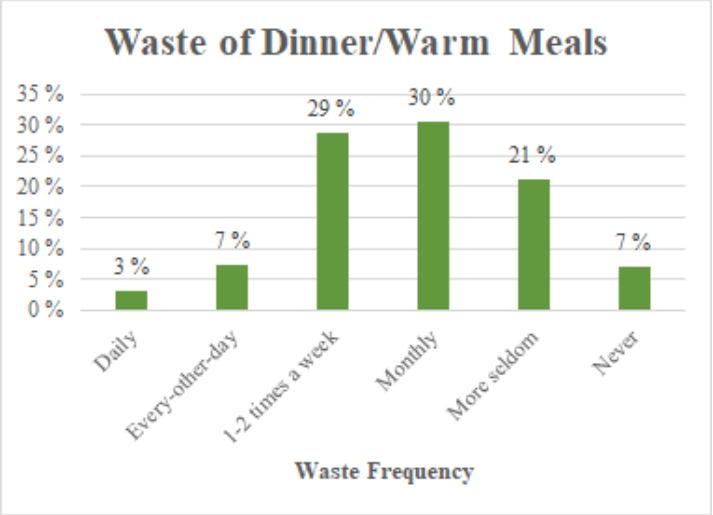

Figure 10. Waste of Dinner/Warm Meals - In percentage per category.

Source: Based on ACT-data (N=836)

About 30% of the interview respondents answered that they wasted dinner/warm meals daily, whereas 15% said every-other-day and 5% answered 1-2 times a week (see Figure 11). Dinner-leftovers were most frequently disposed, especially if there were small amounts left: "*If there is 2dl of toro-tomato soup left then I don't care to save it"* (Respondent #13) and "*If there are left boiled carrots and a potato after dinner then I will easily throw it away*" (Respondent #15). Leftovers which were saved and intended to be used later, were often forgotten: *"Every Friday we have taco and we always use tortilla-wraps. After dinner there are always wraps left that we just put in a plastic bag and put in the fridge. After a few days they have gone bad and we have to throw them away. When Friday comes we buy everything new, and this happens every time*" (Respondent #8)

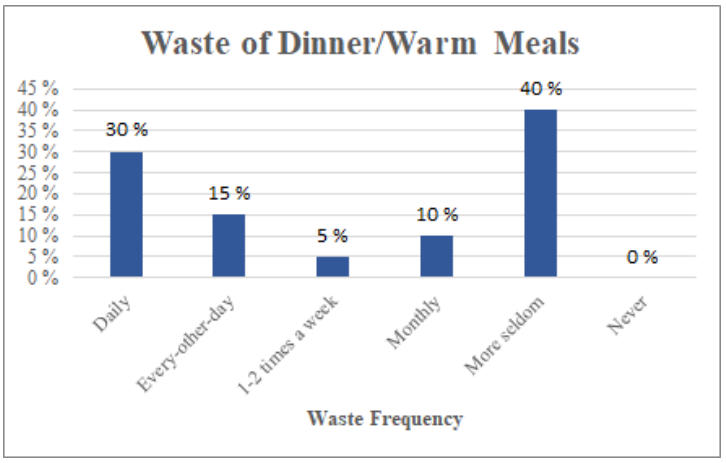

Figure 11. Waste of Dinner/Warm Meals - In percentage per category.

Source: Based on Interview-data (N=20)

Moreover, 10% estimated to waste dinner/warm meals monthly, whereas 40% answered that they wasted these items more seldom than monthly. One of the respondents who answered that they wasted dinner/warm meals more seldom than monthly commented that this was because the children were allowed to serve themselves: "*We don't throw away any leftovers from dinner or anything. The kids take what they want on their plate, and they usually finish it"* (Respondent #11).

5.1.4 Waste of Fruit/Vegetables

The last category is fruit/vegetables. Figure 12 shows the waste frequency among the respondents from the ACT-data (N=834). Almost half of the respondents answered that they wasted fruit/vegetables on a monthly basis, whereas 28% answered that they did so more seldom than monthly or never. 20% reported that they wasted fruit/vegetables a couple of times a week, 3% answered every-other-day, and only 1% answered to do so daily.

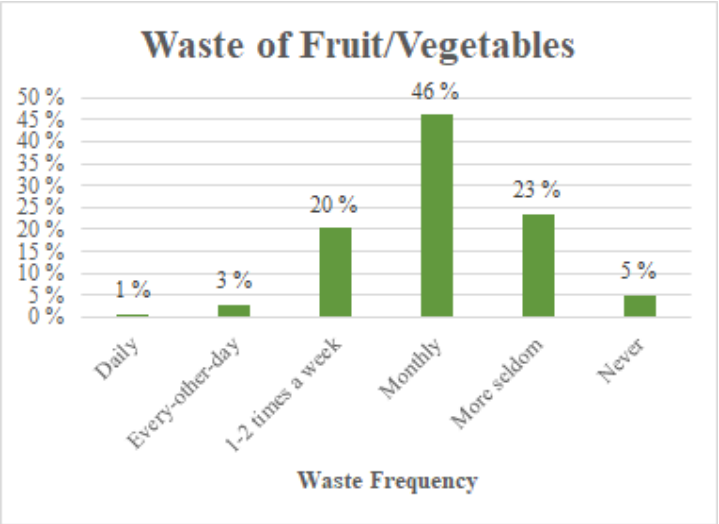

Figure 12. Waste of Fruit/Vegetables - In percentage per category.

Source: Based on ACT-data (N=834)

Furthermore, the interview-respondents answered that fruit and vegetables are the items that they waste the most of (see Figure 13). 5% of the respondents answered that they wasted these items daily, whereas half of the respondents answered that they wasted fruit/vegetables every-other-day or 1-2 times a week. Many of the respondents commented that they often threw away fruit: "*Often I buy too many bananas. I know [name of child] likes bananas. But then I suddenly buy four or five bananas and I think I will have time to use them in a few days. Suddenly it is the third day, I have forgotten about them, and they have become brown.*

So I throw away bananas every week" (Respondent #2). Other respondents reported that they often had vegetables that they intended to use for specific meals, that went bad or were forgotten prior to being able to use them: "*I don't think I waste that many fruits and vegetables, but if there is left carrots or veggies that I was supposed to use for dinner or other meals, I do not care to save them. So, I guess I throw away vegetables at least a few times a week*" (Respondent #13).

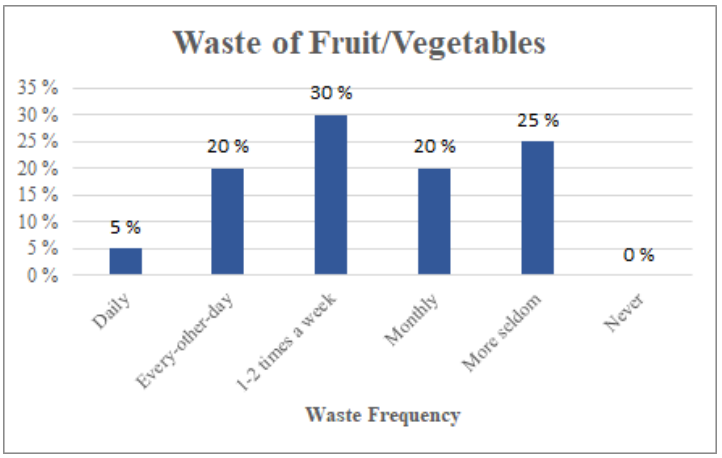

Figure 13. Waste of Fruit/Vegetables - In percentage per category.

Source: Based on Interview-data (N=20)

20% of the interview-respondent answered that they only threw away fruit/vegetables monthly, whereas one-fourth answered that they wasted these items more seldom than monthly. Respondent #5 reported that her household used to throw away a lot of vegetables, but that it now only happens seldomly: "*Before we only used fresh vegetables and we threw away so much. Like carrots, cauliflower. Now we use only frozen vegetables and we almost never throw anything away"*. Another respondent, #11, reported to also seldomly throw away veggies but that it still sometimes happens: "*Like yesterday I found a broccoli in the back of the fridge that had gone bad… Like really bad. I totally forgot we even had it"*.

5.2 Why are households with children wasting food?

In order to answer RQ2, "why are households with children wasting food?" I will examine both the quantitative and the qualitative data. I will do so by first looking at the ACT-data and how individual characteristics affect the amount of food waste. Following this, I will examine the findings from the interviews.

5.2.1 ACT-Data

Through four multivariate regression analyses, I will in this section examine the ACT-data and how individual characteristics affect the amount of food waste. The four models correspond to the four food-item categories (drinks; baked goods; dinner/warm meals; and fruit/vegetables), and will look at the dependent variable of food waste frequency and right-hand variables of individual characteristics of the respondents. The characteristics analysed are: income; gender; education; amount of children; and age.

Before running regressions, I tested for multicollinearity by assessing the variance inflation factor (VIF) to assure exclusion of any proxies. There are different guidelines used to determine an 'acceptable' VIF. According to Field et al. (2012), a VIF above 8 indicates high correlation which is problematic, as a high correlation can cause problems when interpreting the results. In this case, all the values are around 1 (mean VIF 1.13) meaning a low multicollinearity and that there is no correlation between the independent variables. After ensuring there was no multicollinearity, I ran regressions as explained. Table 4 (see next page) shows the regressions analyses.

The table consists of four models:

Model 1: Multivariate regression analysis of drinks
Model 2: Multivariate regression analysis of baked goods
Model 3: Multivariate regression analysis of dinner/warm meals
Model 4: Multivariate regression analysis of fruit/vegetables

Table 4. Multivariate Regressions of the 4 Models

Dependent Variable: Food Waste Amount		Model 1: Drinks	Model 2: Baked Goods	Model 3: Dinner/Warm Meals	Model 4: Fruit/Vegetables
		Coef (Std. error)	*Coef (Std. error)*	*Coef (Std. error)*	*Coef (Std. error)*
VARIABLES	Income	-0.047*** (0.017)	-0.073*** (0.017)	-0.093*** (0.0209)	-0.053*** (0.015)
	Education	0.051 (0.030)	0.027 (0.030)	0.095*** (0.035)	0.005 (0.027)
	Amount of children	0.099 (0.048)	-0.051 (0.048)	-0.130 (0.056)	0.006 (0.044)
	Gender	0.010 (0.073)	-0.036 (0.073)	-0.033 (0.085)	0.066 (0.067)
	Age	0.010** (0.004)	0.008 (0.004)	0.020*** (0.005)	0.017*** (0.004)
Intercept		4.031	4.261	3.523	3.464
Number of observations		836	833	832	830
Adjusted R^2		0.0145	0.0214	0.0456	0.0326
(F-test) P-value		0.0042	0.0004	0.0000	0.0000

Level of significance *** = 1%, ** = 5%,

Table 4. illustrates the data obtained from the regression of the four Models (One model for each food-category).

Before analysing the models in detail, I want to add a comment regarding the R^2. The more variables that are added to a model, the more explanatory power the model can have. To adjust for the strength of each added variable, I have used the adjusted R^2. As shown above, the R^2s for all the models are very low, meaning that the models do not explain much of the variation in food waste. However, they are still of value to identify how standard individual characteristics impact food waste.

5.2.1.1 Waste of Drinks - Model 1

In the first model, the variable of income was found to be significant in explaining variation in waste of drinks, significant at the 1% level. The coefficient of the variable of income is -0.047, meaning that when the independent variable increases, the dependent variable decreases. In this case, indicating that the more a respondent reported to be earning, the more frequent they waste drinks. The age-variable was significant at a 5% level. The coefficient of 0.010 suggests that the older the respondents were, the less frequent they waste drinks. The variables of education, amount of children, and gender have corresponding coefficients that are not statistically significant. The R^2 of Model 1 is 0.0145, meaning that the explanatory variables in the regression explain only 1.45% of the variance in drinks wasted.

5.2.1.2 Waste of Baked Goods - Model 2

The second model illustrates the correlation between the variables and the frequency of wasting baked goods. As in Model 1, the coefficient corresponding to income was statistically significant at the 1% level. Again, higher income corresponds to more waste. Outside of income, none of the individual characteristics proved to be statistically significant in Model 2. The corresponding R^2 is 0.0214, meaning that the model explains 2.14% of the variance in baked goods wasted.

5.2.1.3 Waste of Dinner/Warm Meals - Model 3

There were three variables significant (at the 1% level) in Model 3: income; education; and age. The coefficient of the income-variable is -0.093, indicating similar waste-tendencies as in the previous models, that the more a respondent reported to be earning, the more frequently they waste (dinner/warm meals). Furthermore, the coefficient of the education-variable is 0.095, suggesting that the higher level of education corresponds with less dinner/warm meals waste. The coefficient of the age-variable suggests that the older the respondents were, the less frequent they waste dinner/warm meals. The R^2 suggests that the model explains 4.56% of the variance in dinner/warm meals wasted. This implies that individual characteristics explain more of the variation in wasted warm meals than other categories of food in the data, though the R^2 is still very low. Still, the p-value for Model 3 is 0.0000, which means that the model has significant explanatory capacity of waste frequency of dinner/warm meals.

5.2.1.4 Waste of Fruit/Vegetables - Model 4

The last model, Model 4, illustrates the correlation between the variables and the waste frequency of fruit/vegetables. Following the pattern of previous analyses, income was yet again significant at the 1% level. With a coefficient of -0.053, it implies that higher income corresponds with more waste of fruit/vegetables. Age was also significant at the 1% level, with a coefficient of 0.017. Outside of income and age, none of the individual characteristics proved to be statistically significant in Model 4. The p-value for Model 4 is 0.0000, implying that the model has significance in explaining the waste of fruit/vegetables. The corresponding R^2 is 0.0326 which states that this model only explains 3.26% of the variance in fruit/vegetables wasted.

5.2.2 Interview Data

I will now change the focus from the ACT-data, towards the interview-respondents from Ringerike. As illustrated above, the individual characteristics explain only a minor fraction of the variance in food waste frequency, and therefore there is a need to examine other factors that may affect food waste. This section will analyse the qualitative data regarding this phenomenon by looking at the surface factors and underlying factors. The surface factors refer to what the respondents think are the reasons for them wasting food, whereas the underlying factors refer to the factors that the theoretical framework implies are the reasons for their food-wasting behaviours. I will explore these two factors by: first, analyse the reasons given by the respondents of why they waste food; and second, present and analyse the archetypes that have derived from the data.

5.2.2.1 Surface Factors

During the interviews, the respondents were asked to discuss the most common reasons for why their households were wasting food. There was specifically one reason which all the respondents mentioned: insufficient planning. Three specific factors were mentioned with regards to planning: (i) the process of grocery shopping and planning meals; (ii) predicting food amounts; and (iii) products expiring prior to usage. These will further be examined in the sub-sections below:

Factor 1: The process of Grocery Shopping and Planning Meals

Many of the respondents stated that the process of wasting food began when going grocery shopping, where insufficient usage of a shopping list was often the ultimate culprit. Respondent #7 explained "*I try to write and use a shopping list, but I also like to have everything I need available at home, it's just one thing I like to treat myself with. But again, I buy too many products, often things I already have at home, I have no proper overview because of it. And then so many things go bad before we are able to use them"*. Half of the respondents said that they would write a shopping list prior to going grocery shopping, but it would mostly be for basic food staples, such as rice, spices, flour, etc. The other half of respondents stated that they did not use a shopping list and would decide while being in the store what to buy, and that they would often buy items that they always ate and new items to try out. Respondent #3 said that she does not "*care to use a shopping list",* and further elaborated *"I go grocery shopping once a week, in the same store, and always take the same route between the aisles. Then I buy the products I know I need, and also maybe find something new to try"*.

Respondent #12, who did not use a shopping list, also mentioned that the process of grocery shopping was one of the culprits of him wasting food. He explained that he would "*buy too much on impulse"* and further elaborated on the issue of meal planning, "*even if I try to plan our meals, things can change and I am not able to make what I had thought"*. The topic of meal planning was something which most of the respondents discussed when explaining why their household wasted food. Respondent #13 explained that he tried to decrease the amount of food waste from his household through deciding in advance what they would eat on different days. He said that this did not help due to unpredictable circumstances or spontaneous pastime activities. "*Suddenly the kids have some activity or they go home with friends, and suddenly we don't have time for dinner. Then that day's dinner is wasted and expires"* (Respondent #13). Respondent #1, who would usually plan dinners in advance, also explained that spontaneous activities could cause her household to waste food. "*It happened that I picked up the kids from soccer with some of their friends and we drove past burger king. And the kids want milkshakes, and we end up stopping there just to buy that. Suddenly we end up buying burgers, fries, all that stuff. The dinner I was planning to make that day then just doesn't happen."* (Respondent #1). Many of the respondents discussed that it was not only due to their kids that they would waste food in these situations, but some also referred to them wasting their own lunches due to poor planning. Respondent #20 elaborated further on

this topic: "*Since I have a background in economics I always think about opportunity cost. If I brought lunch to work, a lousy sandwich or something, and I got offered something delicious for free then I would rather eat that than my sandwich. It's easy math for me, I am not wasting any money even if it means I have to throw the sandwich away".*

Factor 2: Predicting Amounts

The next factor influencing food waste behaviours was not properly predicting food amounts. Most of the respondents stated that it was difficult to predict the amounts of food which they and their children would eat. This occurred on two occasions specifically, when making lunch boxes for their kids and when cooking dinner. Respondent #8 explained that "*it varies from day to day whether they* [their kids] *have finished their lunch box. Depends if they had time to finish it, if they were hungry, all that stuff".* Most of the respondents answered that they think their kids finish most of the food they make for them for lunch, but that it is difficult to predict exactly how much they want. "*Some days [*name of child] *eats all the fruit, yoghurt and the two slices of bread. And then I think, okay I will make the same for the next day, but then suddenly she only eats the yoghurt"* (Respondent #3). When it came to dinner, respondents mentioned the difficulty with predicting amounts of pasta, rice or potatoes that the household wants. Respondent # 19 elaborated "*we're a family of 4, and I never know exactly how hungry everyone is. I just cook the whole pasta pack because it says that that's around five portions. Well we don't finish it all, but I have already cooked it. And I have heard it's not so good to heat it up again after it has cooled down. But I put it in the fridge anyways, and usually throw it away".*

When asked about what they usually do with leftovers from dinners, most of the respondents stated that they would refrigerate it regardless of them planning to eat it or not. Respondent #16 mentioned "*I usually eat the leftovers we have, like for lunch or dinner the next day. Or not always actually, like noodles and pasta I feel like I throw away so much of".* However, most of the respondents stated that if there was enough leftovers from dinner for one meal, it would be eaten by them or their partner in the evening or for lunch the day after. Respondent #10, for instance, stated that she would usually eat the leftovers the day after, or "*if it is not that much left we have two lucky dogs that get to eat it".* Respondent #8 added that after being asked about leftovers and residues, she came to the realisation that her household wasted more food than what she initially thought: "*I have always thought we are good at not*

wasting food, but now while talking about leftovers and stuff I've realised that we are not as good at it as what I thought".

Factor 3: Products Expiring

The last aspect that was mentioned frequently was the issue of food-products expiring before they were able to use them. This was also brought up as the consequence of them not planning well enough and not being able to predict how much to make, but also occurred just from forgetting the products. However, most of the respondents stated that the issue was not that products had expired, but that they forgot about the expired products for a long time so that they became bad and had to be thrown away. An example being dairy products, such as milk, which most were quite positive towards utilising even after it had expired. "*If we use expired milk? Of course! But sometimes we open a new milk that we just bought, before using the old one. And then it can happen that we forget to use the older one and it gets sour and clumpy, then we throw it away"* (Respondent #12). Another respondent mentioned that they "*try to think of the expiration date on the milk cartons as a guidance"* (Respondent #7), whereas another respondent said that *"I don't use the expired milk, but my husband does"* (Respondent#9).

Overall, most of the respondents reported to not mind using products that had expired, such as dairy-, frozen- or canned-products. However, fresh produce, such as meats, fish, bread, fruits, and vegetables, the respondents were a bit more sceptical about. Respondent #2 elaborated on the issue of meat and fish specifically, saying that "*I know you can get really sick from eating expired meats, or fish. I don't want to take that risk"*. When asked whether they used brown bananas or soft tomatoes, most of the respondents were positive. However, many of them commented similar to Respondent #3 "*I try to use expired items, but I would never eat tomatoes or cheese that have mold, or other things that have gone bad".*

5.2.2.2 Underlying Factors

I will now move on to the underlying factors of why these households waste food. In order to look at the underlying factors of food-wasting, I will in this section present the underlying factors found in the interview-data that may influence the individual behaviour. According to the theoretical framework, there are three levels that are believed to influence human behaviour: general, issue specific, and behaviour specific factors. The levels move from

general to more specific factors. In this section I will look at the factors from all levels, and the casual relationship between these that might cause food waste behaviour.

This part of the analysis was based on constructing archetypes. The organisation and categorisation through NVivo was used for creating the archetypes. The respondents of the interviews were sorted based on the different individual factors with respect to the levels of the framework. The archetypes have been developed based on reappearing patterns and similarities of the different respondents. They were sorted specifically based on their behaviours, issue- and behaviour specific beliefs and norms, and social context. Out of the twenty respondents, three archetypes became evident: *The Health and Nature Concerned (representing* 6 individuals*); The Food Interested (representing* 5 individuals); *The Maintaining Status Quo* (representing 6 individuals). It is however, important to note that not all respondents will fit into the three archetypes observed, as there will always be some deviation. In this case, only 3 of the respondents did not 'fit' any of the archetypes.

The archetypes presented have been developed as an approach to not only answer why some individuals waste a lot while others do not, but were also developed as it will make it easier to analyse the two last research questions as well. On the next page, the three main archetypes and their main attributes ordered according to the theoretical framework and levels are illustrated. Following the illustration, there are descriptions regarding the traits and similarities of the respondents within the archetypes.

Table 5. Archetype Illustration

		
The Health and Nature Concerned	**The Food Interested**	**The Maintaining Status Quo**
Level 1: **-** Mostly female **Level 2:** **-**Want to eat healthy and balanced -Do not necessarily like the cooking but do it for the health -Care for nature -Believe climate change is caused by anthropogenic activities -Believe in change among the general public **Level 3:** -See themselves as environmentally friendly and want to decrease their food waste **Level 4:** **-**Uses a shopping-list 80% of the time -Do most of the cooking in the household -Reports wasting small amounts – if any, mostly bread and fruit/vegetables	**Level 1**: **-**Both female and male -Interested in cooking new things – not interested in leftovers **Level 2:** **-** Believe in climate change but that it should be combated through systemic changes **-**Are interested in doing other things for the environment than decreasing food waste **Level 3:** - Do not believe that they waste much food **Level 4:** -Uses a shopping-list 50% of the time -Do most of the cooking in the household -Reports wasting high amounts – mostly leftovers and expired items	**Level 1:** **-**Mostly male - Not interested in cooking **Level 2:** **-**Believe in climate change, but not very interested in nature or the environment - Think bigger countries should change to combat climate change **Level 3:** -Most do not see how climate change is related to food waste -State that they do not think about how much they waste – it is just habit **Level 4:** -Almost never use a shopping-list -Reports wasting an average amount to high amounts – mostly leftovers, bread, deli meats etc.

The first archetype, 'The Health and Nature Concerned', consists of women who care for nature and the environment. They cook healthy and "balanced" meals for their households, and report wasting small amounts of food. Many reported that they would often buy products in the grocery store that were about to expire, especially products that were discounted because of their expiration date. Many of them grew up with stay-at-home mums and were included in household chores, such as cooking, from a young age. "*I grew up on a farm and my mum stayed at home and always cooked the food. I admire her because she never wasted anything"* (Respondent #1). Many of them feel connected to nature, some are frequently in the forest or in their cabin on the mountain. They all have strong opinions about climate change and many of them believe "*we have to do something to combat it"* (Respondent #4). Most of the respondents would also discuss topics as nutrition, consumer waste and nature with their friends and family. "*Most of my friends think the same as me, so it's a big echo chamber to be honest"* (Respondent #6).

The second archetype is ‘The Food Interested’. The respondents that fit into this archetype all have different individual characteristics, such as occupation, relationship status, and the kind of house they live in. However, in common, they are all quite interested in cooking and food. They use a shopping list for basic food staples, but like to walk around grocery stores to find new products and gain inspiration for new things they can make. They all expressed that they enjoyed cooking, and that they wanted to make something new every day. Most of them had either studied nutrition or worked previously in restaurants or cafes. One of the respondents in this category, Respondent #2, elaborated that she was interested in cooking meals that both her and her child enjoyed, and said “*I ate such boring food during* my *childhood and I’m really not interested in that anymore”*. When these respondents go grocery shopping they were interested in picking fresh produce and items that had the longest expiration date: “*I don’t care to buy a milk on Monday that expires on Wednesday when I can buy one that expires on Friday”* (Respondent #9). They all believed in climate change, but most commented that they did not have enough knowledge regarding the topic to discuss it. Respondent #8 elaborated on this: “*Well of course I believe in climate change, but I'm not really interested in this topic. But you can see it on the news, the ice is melting, how the weather changes. Also scary what is happening here in Norway with landslides and stuff. But maybe these things have happened before, I’m not sure. But yeah, I believe it’s happening”*. Most individuals fitting to this category believe that there should be systemic change to combat climate change, and are not sure what individuals can do to help. “*The best thing would be to get an agreement with the EU or something. Like what can Norway do? We can try our best and drive electric cars, stop producing oil and stuff like that, but we probably emit around 2% of the entire EU’s climate emission. We also have to think about the economy”*(Respondent #12). Some of these respondents would discuss climate change with their friends and family, but most stated that this was not a big topic of conversation among their network.

The third archetype, 'The Maintaining Status Quo', consists of individuals who were not interested in decreasing their food waste, and in this sample, consisted of only men. Overall, most of them were not interested in cooking and often served semi-finished[14] or already-cooked meals. They would use a shopping list if they had to remember something specific. Most of them would usually decide on a day-to-day basis what to cook, and preferred to not eat leftovers. Especially two respondents elaborated on this preference, Respondent #14 said "*I mean, I don't mind leftovers, I just don't like to eat it. Usually my wife will eat it",* and Respondent #18 said that he would only eat the leftovers if "*I can bring it to work, like pizza, that I like. But fish and potatoes, dishes like that, those I don't bother with".* Overall, the respondents believed in climate change, but there were differences in the levels of interest among the respondents. Respondent #14 said that for him it was not so important to protect the environment, but elaborated "*of course I don't throw away trash in nature or let the engine on my car stay on unnecessary, but the environment and climate change is not really something I am interested in".* Another respondent (#16), when asked about whether he believed there were any consequences of climate change said "*I don't know enough about this, but maybe by looking at the weather? This is a big discussion. We have warmer winters and more rain, so I guess the situation is not great. But then again, some people say this is normal and that this has happened before. I'm not sure".* Moreover, climate change, the environment, or food waste were not topics discussed by friends or family. Three of the respondents in this category did comment that they had a partner who was interested in the environment and climate change, but that it was not an interest they had in common. Respondent #20 said *"I leave that stuff up to her[*wife]. *She can eat all the expired food she wants, recycle, and bring her own tote bag to the grocery store. But that is her thing, not mine ".*

[14] Norwegian: Halvfabrikat

5.3 Are the respondents from these households interested in reducing food waste?

The third research question is concerned whether the households with children, previously discussed, are interested in reducing food waste. I will, in this section, examine the interest by utilising the archetypes developed by the interview-data to present the results of whether the households interviewed are interested in reducing their food waste.

The Health and Nature Concerned

The respondents belonging to the 'health and nature concerned' archetype expressed the most interest in reducing food waste among all the respondents. These respondents believe that food waste is directly linked with climate change and want to decrease their waste-habits because of it. Respondent #11 elaborated on this: "*Of course it* [food waste] *affects the environment and climate. There is a lot of* CO_2 *that emits because of it, like through production. But also transport and ploughing the field. Especially lots of* CO_2 *from meat production"*. Respondent #6 also elaborated on this: *"people waste too much because they don't know the resources that are needed to produce it. Like an avocado, for example, is an excotic product that has a huge climate emission because many are transported here and go bad and have to be thrown away"*. However, many of these respondents also stated that they did not waste much to begin with, and that it was difficult for them to know how they could decrease their waste further. "*Of course I want to decrease food waste. But I feel like I waste so little, I am good with leftovers and all that stuff. I am not sure how I could decrease the small waste I have*" (Respondent #4).

Yet, many of these respondents expressed it to be easy to reduce food waste, and did not understand how others could waste so much. Many of them had already implemented different measures in their households, such as having specific days in the week they would eat all the leftovers, freezing fresh produce before it expires, and being conscious of their grocery shopping. "*Food waste is something that is easy for me to do something with. I know how much it costs to produce food and the whole process around it. Everyone can do something to reduce their waste*" (Respondent #11). One of the respondents, #5, stated that

she had already decreased so much of her household's waste due to environmental reasons that she had now run out of ideas. However, if any of the members in her household were to waste food she would do her best to ensure it did not happen: "*it's important for me to reduce my food waste, but this is also due to financial reasons. We shouldn't waste our resources*" (Respondent #5).

The Food Interested

The individuals fitting in the 'food interested' archetype had scattered answers when it came to interest in reducing food waste. Some were interested in reducing their food waste, whereas others believed they did not waste much and were not so interested in deliberately going out of their way to further reduce their waste. The individuals in the 'food interested' archetype who were interested in reducing their food waste mentioned the problem with overall overconsumption, and that they were interested in reducing their consumer waste overall, not just their food waste. "*I think the thing nowadays is that we can afford too many things, people stock up on food and buy whatever they want. They do not check at home what they already have and just buy new things. We are so spoiled nowadays*" (Respondent #9).

The respondents who were interested in reducing their waste were also mostly the ones who reported the least amount of waste among the respondents in this archetype. The respondents who were not interested in reducing their waste, and believed that they did not waste much, reported a higher waste than the ones who wanted to decrease their waste. Despite the amount of waste, most of the individuals fitting in this archetype did discuss the overall problem with food waste, and that it indeed should be reduced - but that they did not see how it could be done by their household. "*I think other people throw away a lot, but I think we are quite below the average. I think we are incredibly good with food waste. Of course, we also throw away food but not as much as others*" (Respondent #9)

The Maintaining Status Quo

The respondents within this archetype were particularly characterized by being uninterested in changing their food-wasting behaviours, hence the name of the archetype. Many of the respondents said that they knew their household wasted a lot of food, but that these are items they always throw away and are not interested in decreasing. Respondent #18 said "*I know I waste a lot of food, but that's just the way it is. [...] I don't waste food just for the sake of doing so, mostly because it's a habit*".

Most of the 'Maintaining Status Quo' respondents believed that something should be done to combat climate change, but did not believe that much could be done by them personally, nor did they want to change their food-wasting behaviours to combat it. Many of them also stated that there are other important aspects to life than protecting the environment, and did not see how decreasing their food waste would help climate change nor the environment. Many of the 'Maintaining Status Quo' respondents were overall aware of the consequences of food waste and stated "*I don't waste food just for fun*" (respondent #17), however, these respondents had low-levels of self-fulfillment deriving from decreasing their food waste and therefore, were not particularly interested in this. Some of the respondents who mentioned they had a partner interested in climate change issues and food waste did however mention that they were more aware of their food waste behaviours now than before. "*It has become more important now to think about food waste because of my wife and son, so I do think about it. But it is just not something that I care much about" (*Respondent #20).

5.4 What kind of measures do the respondents from these households believe should be implemented to reduce household food waste?

I will in this section answer RQ4 in regards to what measures the households with children believe should be implemented to reduce household food waste. To answer this RQ, I will use the interview-data and examine both the most common answers given by individuals fitting within the archetypes, and the individuals not characterised by an archetype. The respondents

were asked to specify measures that could both be implemented by the household itself, and measures that could be implemented by external actors. I will first present household-specific measures and then present the measures beyond the household.

5.4.1 Household-specific measures

Beginning with the household-specific measures that could facilitate a reduction. In Table 6, the suggestions brought forward by the interview respondents are presented. The measures are sorted based on archetype characterising the individual suggesting said measure. As previously explained, not all the individuals fit into the archetypes, therefore, a fourth section, called 'other', presents the suggestions brought forward by the individuals who did not fit into an archetype.

Table 6. Suggested measures that could facilitate a reduction in household food-waste

Household-Specific Measures	
Archetype	**Measure Suggestion**
 **The Health and Nature Concerned**	• Better planning and predictability of household activities • Prepare meals a few days in advance • Involve the children in the planning and cooking process - teach about the value of food • Do not go grocery shopping before most of the fresh produce have been used - to limit the chance of them being forgotten
 **The Food Interested**	• Plan meals that need the same kind of groceries • Write down what they already have at home prior to going grocery shopping • Cut back on impulse-purchases • Only buy exactly what they need for specific meals and smaller packages - even if it is more expensive
 **The Maintaining Status Quo**	• Calculate the financial loss of their household's food waste • Freeze fresh produce prior to their expiration so they will last longer • Only cook meals they know that their household likes - to reduce the chance of meals being wasted due to not liking them
Other suggestions	• Composting the leftovers • Give leftovers to animals - such as community chickens or pigs

The measure suggestions illustrated in table 6. shows that there are significant differences in proposed measures. The difference will be discussed later (Chapter 6). As examined in 5.2.2.1, insufficient planning was one of the main culprits of why the households interviewed wasted food. Thus, many of the suggestions noted *better planning* as the main approach towards decreasing their food waste.

Most of the individuals fitting the 'health and nature concerned' and the 'food interested' archetypes said that planning their meals better would help reduce their waste. The six respondents characterised as 'health and nature concerned', mentioned that planning meals would allow them to decrease their waste, as they would have a better overview of the meals and products in their possession. Three of these individuals suggested meal-prepping, as the surplus meals could be freezed and therefore not deteriorate. A few of these respondents also mentioned that they wanted to include their children in the planning and cooking process, as they believed that teaching the children about the value of food would cause them to continue the '*good habits*' of not wasting when becoming adults.

Four of the five individuals fitting in the 'food interested' archetype also wanted to plan better as an approach for wasting less food. Contrary to the individuals of the 'health and nature concerned' archetype, these respondents were interested in other ways of planning. These individuals were more interested in planning meals with similar groceries, rather than meal-prepping, as they believed this would encourage them to waste less surplus products. Another suggested measure was cutting-back on impulse purchases, such as discounted products that were not planned for. Three of the 'food interested' individuals also wanted to purchase smaller packages with products (such as milk, deli meats, vegetables) even if it was at a higher cost, as they mostly wasted the surplus products anyways.

As for the 'maintaining status quo' individuals, most did not mention planning as a measure that could be implemented by the household. These respondents (five individuals) were particularly interested in calculating the financial loss their food waste had on their household, and using this as an encouragement towards reducing the waste. Many of them also mentioned becoming better at freezing products that are about to expire, particiruarily meats, as they were more inclined to consume these products after having been in the freezer than when they were about to expire after laying in the refrigerator. Furthermore, for the individuals who were not characterised by an archetype (three individuals), there were two

suggestions that were discussed: composting leftovers, as a way of reusing the leftovers and using it as soil for cultivating own vegetables; and giving leftovers to their household animals (or farm animals if living on a farm), also as a way of reusing.

5.4.2 Measures beyond the households

I will in this section present the measures beyond the household that the interview-respondents found important to facilitate reduced waste of food. In Table 7, the suggestions are organised by archetypes. Also in this table there is a section called 'other', which depicts the suggestions discussed by the three respondents not characterised by an archetype.

Table 7. Suggested measures that could facilitate a reduction in household food-waste

Measures beyond the household	
Archetype	**Measure Suggestion**
 **The Health and Nature Concerned**	• Food-waste campaigns to influence attitudes and values • Reduce prices of all food close to the expiration date or which have become suboptimal - and market it • Children should learn about food waste in school
 **The Food Interested**	• Grocery stores should facilitate that consumers can buy non-packed products - allowing the consumers to only buy as much as they actually need • Public campaigns regarding expiration dates and what they mean
 **The Maintaining Status Quo**	• Campaigns regarding household financial loss of food waste • Increase prices of groceries • Grocery stores should donate all food close to the expiration date to food banks or alternative retail[15] • National law on food waste [16] • National and international cooperation for innovation in the supply chain and energy reduction of global food production
Other suggestions	• Prohibit marketing techniques that enable overconsumption - such as 3 for the price of 2 • Local municipality should incentivise composting

[15] Alternative retailers such as Holdbart, Havaristen, etc.
[16] In Norway: 'Matkasteloven'

Similarly to household-specific measures, the suggestions regarding measures beyond the household were also different depending on the characterisation of the respondents. Starting with the 'health and nature concerned' individuals: all of these respondents suggested food-wasting campaigns to alter attitudes and values. They commented that these kinds of campaigns could cause guilt which would in turn influence people to become more aware of their waste and consumption patterns. Further, five out of six of the respondents characterized by this archetype also suggested that grocery stores should be better at marketing the products that are about to expire and sell them at a discounted price - as a solution towards decreasing food waste at other stages of the food system. Another proposal was to teach children about the value of food and food waste in schools, as a means to shape their values regarding waste from an early age.

The suggestions brought forward by the individuals fitting the 'food interested' archetype were mostly external measures that could be implemented by grocery stores and through public policies. Such as grocery stores facilitating for the consumers to only buy the exact amount of product that they were in need of, for instance, through providing non-packaged items and allowing customers to fill up personal bulk containers with dried grains, meats, vegetables, etc. Most of these respondents also commented that they did not have enough knowledge regarding the expiration date of items, and were not comfortable with consuming expired items. To solve this, three of these individuals suggested that the government or local authorities should run public campaigns on expiration dates, regarding what is safe to consume after it has expired and general knowledge on how to best preserve fresh produce.

Most of the 'maintaining status quo' individuals also suggested public campaigns, however, these were more interested in campaigns on the financial loss of food waste. Five of these respondents also mentioned increasing the price of groceries as the most beneficial measure towards reducing the waste, but mostly as a means to an end. They were not particularly interested in paying more for their groceries, but noted that if the groceries were more expensive, they would perhaps be more inclined to decrease their waste. Other popular measures suggested were encompassing laws on food waste early on in the supply chain, such as a national law regarding food loss in the production stage of products. Also, many

proposed international cooperation for bettering the global food production - but none specified exactly what kind of measures should be implemented on an international level.

Lastly, the suggestions proposed by individuals not characterised by an archetype were regarding marketing tools and incentives. Two of these individuals were negative towards marketing techniques that lead to overconsumption, such as ‘buy 3, pay for 2’, and wanted this to be prohibited. One respondent suggested that the local municipalities should incentivise composting at places it was feasible.

Photo//freepik

Chapter 6: Discussion

The main aim of this thesis is to increase our understanding of the behaviours and attitudes regarding food waste among households with children in Norway, and to investigate possible solutions to decreasing the waste. In this chapter, I will discuss the main findings, answer the posed research questions, and link back to relevant theories explained in Chapter. 3. The discussion will be structured around three parts: (i) food waste behaviours; (ii) food waste attitudes; and (iii) food waste solutions.

6.1 Food Waste Behaviours

The first research question was to identify how much food waste is created from households with children. Both the ACT-data and interview-data was used to answer this, and there were differences between the two datasets regarding how frequently the respondents wasted food. ACT-respondents reported to waste drinks more often than the interview-respondents, whereas the interview-respondents answered to waste baked goods, dinner/warm meals, and fruit/vegetables more frequently than the ACT-respondents. The difference is believed to be due to several factors. First of all, a potentially skewed sample. As the samples have been collected and sampled through different methods it may have caused it to be clustered towards one side of the scale, meaning comparing the two datasets might not allow us to draw a conclusion. However, the findings are nevertheless of interest.

Another factor that may have caused the interview-respondents to report a higher amount of waste than the ACT-respondents, is that it seems as the respondents greatly underestimate how much food they waste. The respondents of both of the datasets were asked to answer how frequently they wasted more than 100 grams of the different food categories (drinks, baked goods, dinner/warm meals, and fruit/vegetables). The interview-respondents were asked at the beginning of the interview how much they wasted foods in the different categories, but after discussing their waste and consumption behaviours throughout the interviews, they were asked again regarding their food waste behaviours. Many of the respondents then altered their answers and commented that they wasted more than what they initially were aware of. So, the differences may be due to the sample differences or respondents being more inclined to answer real estimations in the interviews. This may indicate that many of the respondents underreported how frequently they wasted food, however, not as a result of trying to 'hide' their behaviour - but simply, because they had not reflected on their waste patterns.

Finally, the wording of the question and baseline of '100 grams' may have affected the answers. This is difficult to say for the quantitative data, however, this misconception became evident throughout the interview-data. Initially, the respondents were asked to rank how frequently they wasted the different food-categories. Many of the respondents answered that they did not waste any of the categories that frequently, but later on in the interviews they described waste habits that were not reflected in their waste-frequency answers. When I cross-referenced the answers the respondents had given at the end of the interviews, it became evident that many of the respondents did not look at plate residues or leftovers from the lunchboxes as waste, such as a half-eaten potato, meats, vegetables, etc. In addition, much of their most frequent waste was under the 100 grams baseline, thus not being covered in their initial answers. This may also have affected the answers, as some of the respondents then changed their answers to wasting more frequently, after having reflected on the matter.

Moving on to the findings of the different food categories. The findings were similar to the findings of the studies presented in the background chapter - that fruit/vegetables, baked goods, and leftovers were the most wasted products. More respondents from the ACT-data answered that they wasted drinks more frequently than the interview-respondents, however

the median answer for drinks wastage for both the ACT- and interview-data indicates that the frequency of waste is more seldom than monthly. Furthermore, many reported wasting baked goods often. This was more frequent among the interview respondents, where many stated that bread was the main food being wasted. Many of these respondents said that they often wasted bread as it became dry or moldy prior to being finished. This was often due to inadequate storage, the bread was kept on the kitchen counter, in a warm place, or often not packaged well after its usage. Some of the respondents also noted that when they would buy or bake a new bread prior to the "old" being finished, they would rather eat the new one as it was fresh. Many also stated that the kids did not like the crusts or dry bread, and they would therefore throw away the leftovers.

Waste of dinner/warm meals was the category that respondents from both the ACT- and interview-data reported to waste second most frequently. Half of the interview respondents answered that they wasted this at least weekly, whereas 39% of the ACT-respondents reported the same. According to the interview respondents, they would frequently waste leftovers and plate residues, especially if there was little left. This corresponds with the findings of other food-wasting studies presented in the background chapter - that leftovers cover between 55% and 70% of the avoidable food waste. Some of the respondents noted that they would save the leftovers, in hope of finishing them later, but that often it was forgotten or nobody would eat it - thus being thrown away in the end anyway. This two-stage process was also found by Evans (2012) as referred to in the background chapter. Households would, in hope of using the leftovers, save surplus food instead of immediately disposing of it, even though they knew that it would not get used. In addition to wasting dinner/warm meals, half of the ACT-data respondents reported to waste fruit/vegetables on a monthly basis. The respondents from the interviews noted that fruit/vegetables was among the foods that they wasted the most, and over half of these respondents answered that they wasted fruit or vegetables at least monthly. Especially excotic fruits, such as bananas and avocados, were frequently wasted as they would deteriorate quickly after being purchased. This is often due to excotic fruits being imported from afar and by the time it reaches the consumer, has already started to become suboptimal. Next, vegetables intended to be used for dinners, such as carrots, broccoli, salad-items, were often disposed of due to being forgotten or not having enough time to cook the planned meals.

6.2 Food Waste Attitudes

In this section, I will discuss the food waste attitudes of households with children by discussing the second and the third research question: (ii) 'why households with children are wasting food?'; and (iii) 'are these households interested in reducing their food waste?'. The discussion in this section will be structured around the major findings regarding the different levels of the theoretical framework and the factors within these levels. The theoretical framework is included below for reference (including detailed explanations of the factors):

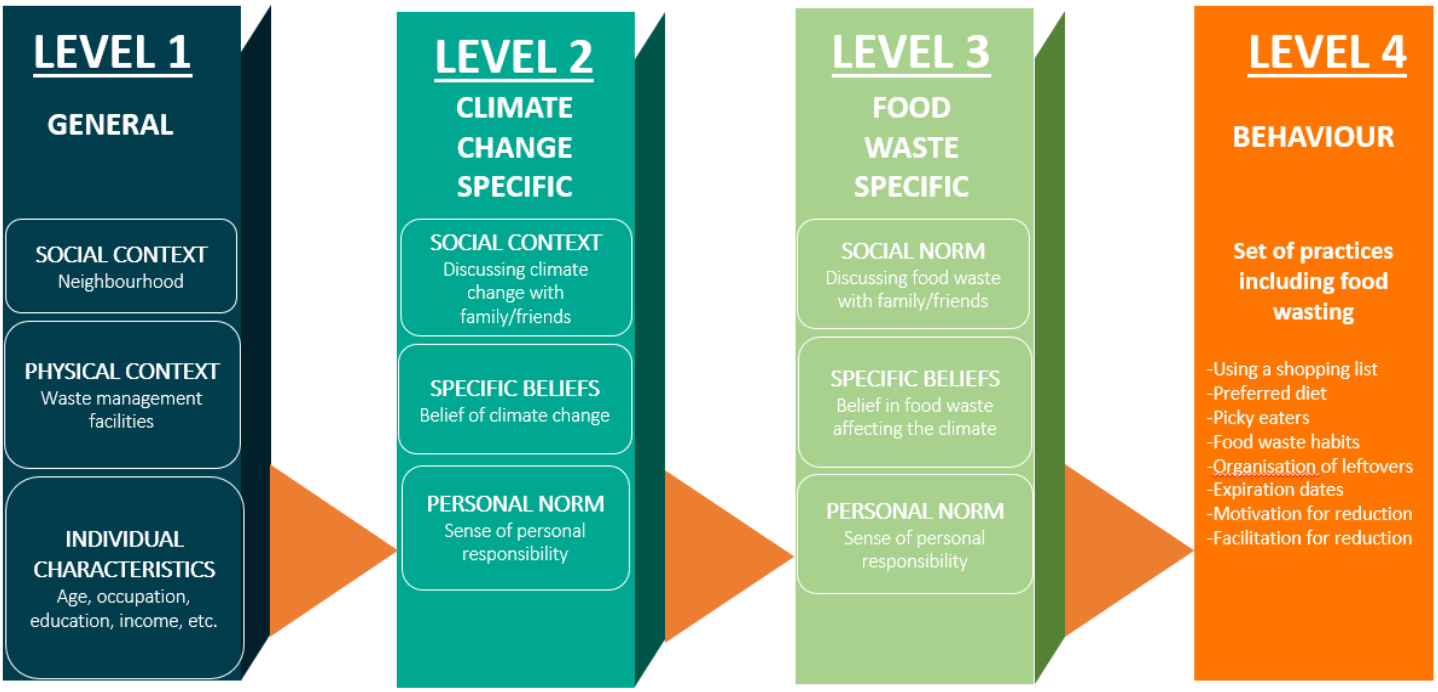

Figure 14. The Adapted Theoretical Framework with Descriptions

Source: Based on the ACT-project framework

Starting with level 1 and the factor of 'social context', which refers to features such as the kind of neighbourhood the respondent lived in. There were no specific findings in relation to social context, as most of the respondents lived in typical mixed suburban neighbourhoods. There were also no specific findings in regards to the second factor, 'physical context'. Enforced by the municipality, all households in Ringerike must sort their food waste in a separate bin. Thus, all of the interview-respondents answered that they separated their food waste from general waste, and most threw away 1-2 bags a week. The last factor in level 1 is the factor of 'individual characteristics' which includes features such as age, occupation,

education, and income. Out of the variables tested, income was the most important explanatory factor for all food waste categories analyzed. However, the models only explain between 1.45% and 4.56% (depending on the model) of the variance in food wasted. These findings were also predicted in the theory chapter, as the assumption was that factors in level 1, such as individual characteristics, mostly influence an individual's behaviour indirectly. Based on the findings, individual characteristics do not explain much of the variations in food-wasting. Other studies, presented in the background chapter, have also found that individual characteristics do not explain as much of the waste as what has been assumed previously. Rather, values, norms and the ability (as well as will) to plan, influence the waste attitudes the most.

Furthermore, I will now discuss level 2, starting with the factor of 'social context'. Climate change specific social context refers to whether climate change is something which is discussed in the household or with friends. The findings from the archetype analysis seem to confirm the influence of social context on conventions and norms (what we do and why we do it), as discussed in the theory chapter. For instance, the individuals characterised by the 'health and nature concerned' archetype spoke of ecco chambers within their social network, and that many of their friends and family had the same opinion on topics such as climate change and food waste as them. Whereas many of the respondents classified by the 'food interested' and 'maintaining status quo' archetypes stated that these were not topics they were interested in discussing, nor were they commonly talked about at home, with friends, or with their closest coworkers. However, some of the 'maintaining status quo' individuals did speak about having partners who were interested in the topics of climate change, environment, and food waste. Nevertheless, as institutional theory states, it cannot be assumed that we internalise all norms held by those we interact with. These respondents did, however, say that even if these topics had not become a common core value of the household, at least between the parents, their partner's interest in the topics had made them more aware of their own behaviour. The question is then whether this awareness will eventually lead to actual behaviour change or not. In addition, the findings do not reveal whether the respondents are surrounding themselves with like-minded individuals, or, whether they are affecting the individuals around them.

I will now move on to the level 2 factor 'specific beliefs', whether the respondent believed in climate change themselves. All of the interview-respondents did believe in climate change, but there was a difference in the level of interest among the respondents. Some believed individual measures could help, whereas others believed that systemic change should be the prominent solution. Thus, moving on to the last factor of level 2, 'personal norm', which refers to whether an individual feels personally responsible for decreasing GHGs emissions or supporting political parties that are advocating change for reducing GHGs emissions. For instance, the individuals who wasted the least food among all the respondents and were characterised by the 'health and nature concerned' archetype, mainly answered that they felt personally responsible and acted based on this notion. Whereas the individuals characterised by the 'food interested' and 'maintaining status quo' archetypes did mostly not feel personally responsible, and rather believed that change should happen through systemic resolutions - however, most of these respondents did not let this idea affect their voting behaviour, and most voted based on other political creed than pro-environmental convictions.

Next, I will discuss level 3, starting with the 'social norm' factor. Food waste specific social norms concern whether the behaviour of wasting food is discussed at home or with friends, and in general what is the food-wasting behaviour of an individual's social circle (e.g. friends, family, coworkers). The findings reveal that those interested in food waste would discuss it, whereas those not interested, would not discuss it as much. However, this may be because I interviewed respondents with dominating norms, meaning that they are the ones who tend to dictate conversations among friends and family depending on their interests. An interesting finding was how the 'nature and health concerned' archetype individuals spoke of their childhoods and what traditions they have kept - and perhaps behaviours that they may have internalised due to this. Conventions and norms are social constructs that we learn, for instance, through our upbringing. Many of the 'nature and health concerned' individuals said they grew up with stay-at-home mothers who were concerned with not wasting any food. This is especially interesting in terms of households with children being the group that wastes the most food in Norway. The findings of this thesis cannot indicate whether the children themselves are at fault for the household wasting a major amount of food (for instance through being picky eaters, not finishing what is on their plate, etc). However, the theory states and the findings indicate that as we are often affected by our upbringing, and that it

might be that the children of households who have parents who waste a lot of food are influenced by this, are in turn, expressing similar behaviours as their parents.

Moving on to the level 3 factors 'specific beliefs' and 'personal norm'. Food waste specific beliefs refer to whether an individual thinks food waste affects the climate, whereas the food waste specific personal norm refers to whether an individual feels personally responsible for decreasing their food waste. The findings from the archetype analysis suggest that specific beliefs and personal norms are important in predicting individual behaviours. This is also supported by the assumptions of the theoretical framework, as the factors within the third level are assumed to be directly tied to the behaviour of an individual. Moreover, Schwartz highlights in his 'Norm Activation Model' (1977) the importance of personal norms in the process of pro-environmental behaviour, in this case the behaviour of decreasing food waste. He found that this kind of behaviour is affected by the feeling of moral obligation to act on one's personally held norms. It is evident that the 'health and nature concerned' individuals, who also had the most environmentally friendly food-wasting behaviour, felt responsible for decreasing their food waste. While the other respondents, most of those who fit into the archetypes of 'food interested' and 'maintaining status quo', did not feel this responsibility nor thought food waste had a big impact on climate change. These findings to an extent confirm the assumptions of the theoretical framework, that what an individual thinks about food waste directly influences their behaviour.

Moving on, the case of the 'maintaining status quo' individuals with food waste concerned partners can be discussed again. As presented in the theory chapter, Schwartz highlights two processes that occur during an individual's environmentally friendly behaviour: activation of social expectations (awareness of consequence and ascription of responsibility) and activation of personal norm. This can mean that those individuals who had partners with conflicting views, were aware of the social expectations and the awareness of consequence. However, did not feel responsible for the negative consequences of not acting environmentally friendly (ascription of responsibility), thus there was no activation of self-expectations (personal norm) which led to a change in behaviour. Perhaps these respondents feel that the cost of changing their food-wasting behaviour is more than what they get out of it - for instance, the probability of their partner leaving them or giving an ultimatum because of this behaviour.

Lastly, I will discuss the fourth level, which encompasses the practices comprising food-wasting behaviour. The behaviour does not only involve the food-wasting behaviour in itself, but also includes several other practices that compose the behaviour as a practice. This includes, but is not limited to, practices such as using a shopping list, preferred diet, food-wasting habits, and motivation for reduction. According to practice theory, it is essential that we view behaviour as a part of a set of actions. The food-wasting behaviour in itself is not an alone-standing habit which just happens, it is affected by an individual's preferences, ideas and other subconscious thoughts. In this case, we can see that the respondents' food-wasting behaviour is affected by a whole set of factors, such as the process of grocery shopping, predicting amounts of food for meals, and relation to expiration dates. Despite the archetype simplification of the individuals, it is important to note that each respondent had a different set of preferences and practices affecting their current behaviour. All have different traditions, live within a different set of social structures, and all live according to a set of practices that relate to each other in individual ways. Nevertheless, this gives us an opportunity to further utilise these theories, the theoretical framework, and findings towards defining in what way one can influence the behaviours of individuals, for instance, towards becoming more environmentally friendly. As the findings state, the behaviours do not necessarily happen because an individual wants the specific behaviour to happen, but rather, is affected by a collection of factors and performances in which one acts.

6.3 Food Waste Solutions

In this last part of the discussion, I will discuss the solutions for decreasing food waste. RQ4 was to identify different measures towards decreasing food waste from households with children, both at household-level and beyond the household-level solutions. As illustrated in the tables in 5.4, my analysis of the solutions are structured based on what archetype the interview-respondents fit into.

I will start with discussing the household-level solutions. According to the studies presented in the background chapter, household-level solutions, or individual measures which they are also referred to, are the most difficult to implement. These studies found that implementing individual measures requires people to be interested in their food waste, and would most

likely only work for households that were already environment-conscious. However, through the interview-data of this thesis, there were several feasible household-level measures that appeared. Thus, I want to start with discussing the measures suggested by the respondents, and further implementation-ideas corresponding to these suggestions.

Starting with the measures at household-level, many of the 'health and nature concerned' individuals suggested better planning and preparing meals for the household a few days in advance, as a way of ensuring the usage of all products. However, these individuals had already implemented similar measures to decrease their household food waste, and along with being the respondents who were the most positive towards decreasing their waste, they were also the respondents with the least self-reported amount of waste. These findings suggest that these individuals are already 'as good as it gets' at avoiding food waste and are already in possession of a high behaviour control in terms of food waste. However, they do suggest measures including 'better planning' as a way to decrease their waste even further. A solution for these individuals could be to create an app that could help facilitate a better overview of household activities, what food-products one already has at home, and meal-suggestions based on these food-products, similar to the app discussed in the background chapter of Aschemann-Witzel et al. (2018). The app could also suggest meals in an order that would ensure that all products one already has at home would be used prior to its expiration or deterioration.

I will now move onto the individuals characterized by the 'food interested' and 'maintaining status quo' archetypes, which were also the respondents who reported the highest amounts of food waste among the respondents. The 'food interested' individuals had some of the highest amounts of self-reported waste among the respondents, yet believed they did not waste that much. They were aware and conscious of the issue of food waste, but their food waste specific personal norms indicated that they did not believe that decreasing it would make much of a difference. Often, these individuals would refer to systemic change and changes made by up-stream actors, before discussing how they could change their behaviour. Many of them were interested in decreasing their food waste, but did not see how it would be possible in terms of their lifestyle. However, many of them did mention insufficient planning being one of the main culprits of their food-wasting behaviour. Due to this, I would also suggest an app

for these individuals, but rather an app that could help them have an overview of their food-wasting habits and give meal-inspirations for their leftovers. As found by Aschemann-Witzel et al. (2018), discussed in the background chapter, it is not necessarily an app that will help cooking-involved individuals with decreasing their waste. Rather, these individuals just need some kind of aid that will spark a reflection regarding their food-wasting habits and intentions - could be an app, but also a website or a journal written by hand.

Next, I will discuss the respondents characterised by the 'maintaining status quo' archetype. These are individuals who are neither interested in food, cooking, or decreasing their food waste in general, and due to their disinterest, the findings indicate that these individuals are unlikely to be motivated by ethical motives to decrease their waste. These respondents suggested that they may be inspired to alter their waste behaviour if they were to calculate the personal financial loss of their wasting habits. These findings are similar to those by Schanes et al. (2018), who found that individuals tend to feel guilt regarding the financial loss tied to their waste. Thus, a solution could be to create a website where those interested could calculate the financial loss of their household's food waste. Nevertheless, most of the respondents belonging to the 'food interested' and 'maintaining status quo' archetypes stated that the ultimate solutions need to be the ones that spark a systemic change, either thought market actors or policy makers.

As most of the respondents commented that they are more likely to change their behaviour if influenced by external measures, I will now discuss the measures beyond the household, such as marketing techniques or public policies, suggested by the respondents. Other studies on household food waste have found that often the waste occurs due to provocations of upstream actors, and therefore, it is important to have systemic change in addition to individual measures, in order to decrease household food waste. Most of the 'health and nature concerned' individuals, suggested nudging and food-wasting campaigns to influence attitudes and beliefs. These kinds of campaigns could definitely be of value, as several studies, presented in the background chapter, have found that such campaigns can remind consumers of their food-wasting habits and make them feel guilty, which in turn can change their in-store behaviour. Also, many of these respondents commented that they had no problem with buying suboptimal or almost expired products in the grocery store and noted that these

products should be decreased in price and marketed for sale, as a way to reduce food waste. However, the respondents who do not have a major interest for the environment or food waste, and were not interested in buying suboptimal products commented that this kind of solution would not appeal to them. The majority of the 'food interested' individuals suggested non-packaging grocery stores, where consumers can buy just exactly as much as they need for their household, whereas the majority of the 'maintaining status quo' individuals suggested monetary incentives.

As the 'health and nature concerned' individuals had the lowest amount of self-reported waste and already had quite environmentally friendly behaviours, the findings indicate that they are deemed less of a priority for targeted policies. As they already wasted so little, it is difficult to establish whether their food-wasting behaviour would improve. The behaviours and attitudes of the 'food interested' individuals indicate that their food waste is related to a lack of planning. For these types of individuals, solutions must be in-line with upkeeping the enjoyment, such as the suggested non-packaging grocery stores. These individuals are already in the process towards environmentally friendly behaviour as they think decreasing food waste is important, and that the step towards real reduction would be via enacting new social norms. The 'maintaining status quo' individuals are unlikely to be motivated by the same type of approaches as the respondents different from them, such as food-wasting campaigns or guidance on expiration dates, as they are not interested in food. For this group, upstream solutions, technological innovations and alterations of food choices are the primary solutions that would work, rather than focusing on these consumers through targeted campaigns. Also, as many of these respondents did suggest financial campaigns as measures towards decreasing food waste, financial incentives and monetary bonuses could be beneficial.

The findings do not indicate clear measures that should be implemented to decrease waste - nor do they indicate that these measures would work. Habits and norms take time to change, yet focusing on changes in the food culture and on changing food waste habits of the young might be a feasible way to reduce food waste. What is interesting is that the respondents who reported the highest quantity or most frequent wasting of food, did not really have the desire to reduce their food waste. These respondents did not have the desire to reduce their food waste, as they believed their food-wasting behaviours were justified. In order to reduce food

waste from private households in Norway, the individuals accounting for the most waste, such as individuals similar to the 'food interested' or 'maintaining status quo' archetypes, should be targeted when implementing measures. The findings suggest that these kinds of individuals do not feel the necessary guilt and/or are in a state of cognitive dissonance, and therefore need external nudges to change their behaviour. An interesting solution could be that municipalities could facilitate a gathering of different individuals characterised by the different archetypes, in order for different kinds of individuals to share ideas, habits, and reflect on attitude. Not only for topics such as food waste, but other topics important for combating climate change as well, as a way to in the long-term alter behaviours and attitudes towards more environmentally friendly practices. Another solution is to introduce children to the consequences of food waste early on, for instance through school facilitated cooking-classes. By teaching them how to avoid food waste and the consequences of household food waste, could help to establish conventions and norms that become internalised, which in turn will presumingly affect their future adult food-wasting behaviours and attitudes.

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Chapter 7: Conclusion

The main aim of this thesis was to increase our understanding of the behaviours and attitudes from individuals with children under the age of 18 regarding household food waste in Norway, and to investigate what measures should be implemented to decrease the waste stemming from these households. To answer the main aim, I divided the research into four sub-questions: *i) how much food waste is created from households with children; ii) why are households with children wasting food; iii) are these households interested in reducing food waste;* and *iv) what kind of measures do the respondents from these households believe should be implemented to reduce household food waste?*

To answer the research questions and aim of this thesis, a mixed-methods approach was employed. The methods consisted of analysing data collected by CICERO, through the ACT-project, and twenty semi-structured interviews collected in the municipality of Ringerike. The research was based on an adapted version of a framework, with concepts deriving from social psychology, institutional theory, and practice theory, obtained from the ACT-project, led by CICERO.

Starting with RQ1, the qualitative-findings reveal that most respondents were not aware of their food-wasting behaviours and the specific frequency of their waste. Almost all the interview respondents adjusted the frequency of their food waste at the end of the interviews, mostly because they had not reflected on the matter. The quantitative-findings show that

households with children mostly waste fruit, vegetables, baked goods, and leftovers. The interview-respondents noted that especially excotic fruits, fresh vegetables, dry bread, and dinner-leftovers were most wasted. Fresh produce, such as fruits and vegetables, were wasted frequently due to the small time-frame from purchase to deterioration. Baked goods, such as bread, would often become dry and suboptimal due to inadequate storage, and leftovers would often get wasted due to insufficient planning.

Next, the findings of RQ2 suggest that several factors (e.g., norms, habits) influence the food-wasting behaviour of households with children, and that it is a complex issue. There are several factors, both surface and underlying factors, that influence food-wasting behaviours. For instance, as surface factors, most of the respondents mentioned insufficient planning as one of the main culprits, mostly in regards to not planning meals, not knowing how much to cook, and not planning enough time to use a product prior to its expiration. Next, by applying the archetype concept, I was able to identify patterns of attitudes and norms that explained the underlying factors of these households wasting food. In essence, some individuals wasted little food due to their interest in doing so, whereas other individuals wasted food often due to being interested in other aspects of life, or not being aware of their habits. Further, in regards to RQ3, the findings reveal that the respondents, mostly the individuals characterised by the 'health and nature concerned' archetype and some 'food interested' individuals, who reported a higher interest in decreasing food waste, also reported to be wasting the least amount of food among all the respondents. Moreover, the respondents who wasted the largest quantities of foods, mostly individuals characterised by the 'food interested' and 'maintaining status quo' archetypes, were also the ones with the least interest in changing their food-wasting habits and behaviours.

Lastly, the findings of RQ4 and what measures these respondents believe should be implemented to reduce household food waste. Starting with household-level solutions, which are the most difficult to implement, most respondents suggested better planning and having an overview of their food-wasting habits. For some of the respondents, such as individuals characterised by the 'health and nature concerned' and 'food interested' archetypes, an app or food-wasting journal would be beneficial. It would allow them to plan their meals better and keep an overview of groceries in their possession, but they would also be able to keep track of

their food-wasting behaviours, which in turn could spark reflections and make them waste less. A similar overview is also suggested for the individuals characterised by the 'maintaining status quo' archetype. For these respondents, a website, journal, or also an app, where they could calculate the financial loss tied to their food waste could be beneficial, as the guilt tied to the financial loss could spark changes in their habits. Next, in terms of external measures, there were several suggestions that are feasible to implement. The most feasible suggestions are: food-wasting campaigns to influence attitudes and beliefs; financial campaigns in regards to the financial loss of food-wasting; and creating arenas for individuals with different norms, attitudes, and habits to meet and discuss topics such as food waste - as reflection could lead to more environmentally friendly behaviours.

Overall, this thesis should be considered as a starting point in terms of designing adequate measures to decrease household food waste. I do recommend that factors from the theoretical framework should be consulted when designing these measures, in order to assure the feasibility and success of future policies. In conclusion, in order to decrease food waste deriving from not only households with children, but from all households, individuals must first be aware of the problem. It is first when we are aware and have reflected on our own behaviour that we can start to change norms and habits. Nevertheless, further research on the topic is needed - and policies on the matter must be implemented. The sole responsibility for change cannot fall on the individual itself, despite private households accounting for most of the waste. It must be facilitated through a mix of upstream actors, external measures, and individual changes.

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Appendices

Appendix 1. Interview Guide

Level 1 – General

1. Hvor gammel er du? [What is your age?]
2. Kjønn? [Gender?]
3. Hva er ditt yrke? Jobber du fulltid? [What is your occupation? Are you working fulltime?]
4. Hvilken utdanning har du? [What is your education?]
5. Sivilstatus? [Are you married/single?]
6. Hvor mange barn har du under 18 år som bor hjemme? [How many children under the age of 18 do you have living at home?]
7. Er du medlem eller støttespiller av en miljøorganisasjon? [Are you a member or supporter of an environmental organisation?]
8. Hvor mye tid har du i løpet av uken til å organisere huset/handle mat/lage mat? [How much time do you have during the week for organising your house/grocery shopping/cook?]
9. Kan du kildesortere matavfall? Hvor mange poser kaster du hver uke? [Do you have a separate food waste bin? How many bags do you throw away every week?]
10. Hva slags muligheter har du for oppbevaring av mat og hvordan bruker du disse oppbevaringsmulighetene? [What kind of options do you have for food storage? How do you use these storage-options?]
11. Hva slags nabolag og hus bor du i? [What kind of neighbourhood and house do you live in?]
12. Hvor vil du si at kunnskapen din om mat og matvanene dine kommer fra? [Where do you think your knowledge regarding food and food habits derive from?]
13. Er det viktig for deg å verne miljøet? [Is it important for you to protect the environment?]
14. Er det viktig for deg at mennesker skal leve i harmoni med naturen og dyr? [Is it important for you that humans live in harmony with nature and animals?]
15. Hva tenker du om forurensing? [What do you think about pollution?]
16. Er klima et viktig tema for deg? [Is climate an important topic for you?]

Level 2 – Issue Specific

17. Diskuterer du klima med familie/venner? [Do you discuss climate with family/friends?]
18. Hva blir diskutert? [What is discussed?]
19. Dersom en person hjemme/annen familie/venner oppførte seg lite klimavennlig, ville dette blitt kommentert? [If a person at home/family/other friends acted non-environmentally friendly, would this be commented?]
20. Tror du klimaendringer skjer? [Do you believe in climate change?]
21. Tror du at det er påvirket av menneskelig aktivitet? Tror du det er noen konsekvenser? [Do you think it is caused by anthropogenic activities? Do you think there are any consequences?]
22. Føler du et ansvar for å skulle redusere egne klimagassutslipp? [Do you feel personally responsible for reducing your own greenhouse gas emissions?]
23. Føler du et ansvar for å støtte politiske partier som jobber for å redusere klimagassutslipp? [Do you feel personally responsible for supporting political parties working for reducing greenhouse gas emissions?]

Level 3 – Behaviour Specific

24. Tror du matkasting påvirker klima? Hvordan? [Do you think food waste affects the climate? How?]
25. Diskuterer dere matkasting hjemme/med venner? Hva blir sagt? [Do you talk about food waste at home/with friends? What is said?]
26. Ville det blitt kommentert i omkretsen din om noen kastet mat? [Would it be commented in your social circle if someone wasted food?]
27. Hvordan forholder de seg hjemme hos deg/venner til mat som har gått ut på dato? [What do the people at home/your friends think about food that has expired?]
28. Har du et ansvar for å kaste minst mulig mat? [Do you have a responsibility to waste away less food?]

Level 4 – Behaviour

29. Bruker du en handleliste når du handler? [Do you use a shopping-list when grocery shopping?]
30. Hva slags type mat lager dere? [What kind of food do you make?]

31. Føler du deg sterkt tilknyttet matrutinene dine? [Do you feel strong attachment to your food routines?]
32. Hvem lager som regel maten? [Who usually makes the food?]
33. Er det noen i familien som er kresne i matveien? [Are anyone in your family a picky eater?]
34. Hvem lager niste til barna dine? [Who makes lunch for your children?]
35. Spiser de som regel opp nisten? [Do they usually finish their lunch?]
36. Hvordan forholder du deg til disse produktene: melk som har gått ut på dato; brune bananer; myke tomater; tørt brød? [What do you do with these products: milk that has expired; brown bananas; soft tomatoes; dry bread?]
37. Hva gjør du vanligvis med rester? [What do you usually do with leftovers?]
38. Omtrent hvor ofte kaster du mer enn 100 gram av disse matvarene: drikkevarer; bakevarer; middag/varm mat; frukt/grønnsaker? [How often do you waste more than 100 grams of these products: drinks; baked goods; dinner/warm meals; fruit/vegetables?]
39. Hvilke matprodukter kaster du mest og hvorfor disse? [What products do you waste most and why these?]
40. Hva definerer du som matsvinn? [How do you define food waste?]
41. Hvordan forholder du deg til ting som har gått ut på dato? [What do you do with products that have expired?]
42. Kjøper du matvarer som er i ferd med å gå ut på dato? Hva hvis det er på salg? [Do you buy products that are about to expire? What if they are discounted?]
43. Hva ville motivert deg til å redusere matkasting? [What would motivate you to reduce food waste?]
44. Hvor føler du at problemet ligger? Hva kunne du gjort for å minske svinnet? [Where do you feel the problem lays? What could you do to reduce the waste?]
45. Hva kan eksterne aktører gjøre for å hjelpe deg redusere matsvinn? [What could external actors do to help you reduce your waste?]

Appendix 2. Information about Ringerike

Ringerike is located about an hour north-west from Oslo (see Figure 1 below). The municipality is a medium-sized urban and rural municipality, and is the largest forest industry municipality, where the business community is largely based on logs. There is also a significant increase of agriculture practiced there. It is an important traffic hub for cars, trains and busses. Europavei 16 (main road to Bergen), Bergensbanen, Randsfjordbanen, and Roalinjen meet here.

Figure 1: Overview of the municipality Viken county.
Source: Google Maps (2021)

The city of Hønefoss functions as the centre of the municipality and the town gained city status in 1852. In addition to Hønefoss, the municipality consists of the rural areas of Nes i Ådal, Vikerfjell, Sokna, Hallingby, Veme, Tyristrand, Haugsbygd, and Åsa (see **Figure 2**). According to SSB, the city of Hønefoss has approximately 16,000 inhabitants, while there are about 30,000 inhabitants in all of Ringerike municipality (SSB, 2021a).

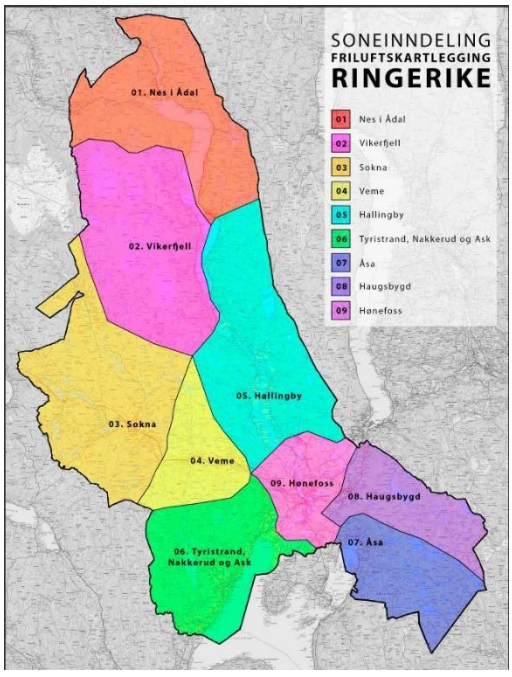


Figure 2: Overview of the rural areas compromising Ringerike Municipality.
Source: Ringerike Kommune (2019)

The population is annually decreasing, mostly due to the relocation of young adults to the Oslo-area, however it is estimated that the population will be 33,000 by 2050 (SSB, 2021a). The age distribution is demonstrated in Figure 3 below. About 22% of the households in the municipality have children under the age of 18 (SSB, 2021a).

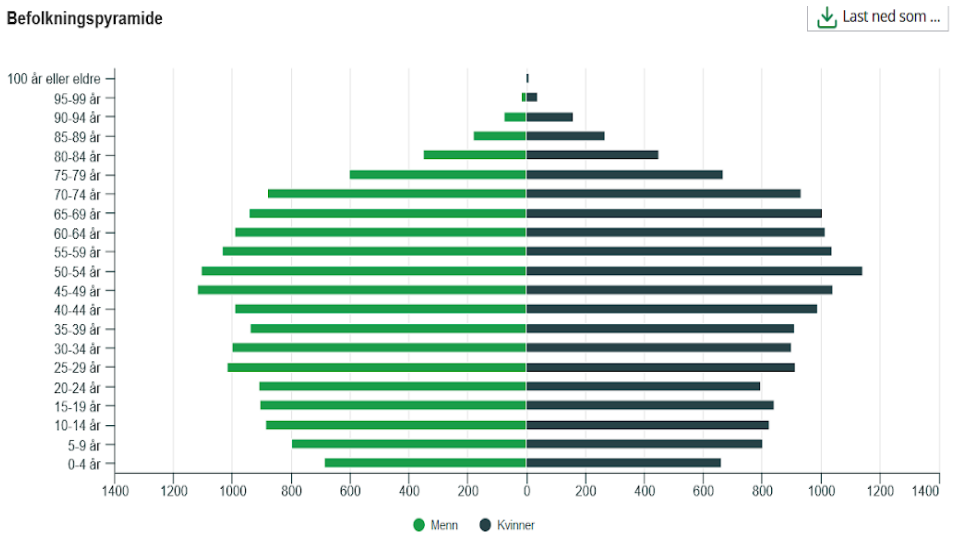


Figure 3: The age distribution of the population per 01.01.21
Source: SSB (2021a)

About 58% of the households live in detached houses, 19% live in semi-attached houses, and 19% live in apartment buildings (SSB, 2021a). Almost 10% of the inhabitants live on agricultural properties (ibid.). Out of the inhabitants between the ages of 16 and 74, 69% are reported to be employed (SSV, 2021b). The agriculture and forestry sectors account for 24% of the jobs in the municipality (ibid.). Ringerike is the largest agricultural and forestry municipality of the former county Buskerud (which was merged together with other counties to create Viken on 1 January 2020). Ringerike is especially known for producing potato and peas which is distributed and sold all over the eastern part of Norway. The most important industries have traditionally been wood processing and concrete production. Since 1893 there were also military bases in the municipality, however these have eventually disappeared due to the reorganisation of the defense since the early 2000s. Despite closing most of the military camps, the force still has a number of employees at the Armed Forces Satellite Station Eggemoen and the Armed Forces Ringerike Station. Further, about 37% of the inhabitants work within the trade and hospitality business, 22% work with health and social services, 7% in schools and kindergartens, 6% work with public administration or in the military, and 3% work with personal service (ibid.). The municipality itself is the largest employer in the municipality, with approximately 2200 employees.

Out of the inhabitants over the age of 18, 28% have studied at university (SSB, 2021b). Further, 42% have finished high school, while 30% have only finished primary school and 1% are reported to not have any kind of education (ibid.). On a national basis, 16% have studied at university, 51% have finished high school, and 32% have finished primary school (SSB, 2021c). Furthermore, about 76% of the households in the municipality have a car, and out of these 50% run on diesel, 45% run on petrol, and 5% are electrical cars or hybrids (ibid.). The amount of fossil fuel vehicles are higher in Ringerike than the national average which is 46% diesel, 37% petrol, and 17% electrical cars or hybrids (SSB, 2021d). According to statistics collected by Ringerike Municipality in 2018, 92% of adults in Ringerike have a license, and each household has an average of 1.7 cars (Ringerike Kommune, 2018). The report 'Travel Habits in Hønefoss and Ringerike' shows that 75% of daily journeys are by car, which is the same amount as on a national basis (SSB, 2021d). Furthermore, the report states that 16% of daily journeys are by walk, 4% by bicycle, and 4% by public transportation (ibid.). In addition, 86% of the working population has access to free parking where they work. Cars dominate as means of transportation in the region and most of the working population utilise a car, while public transportation is mostly utilised by children going to/from school and by the population living in Hønefoss (ibid.). Since 2010 there has been a decrease in the usage of public transportation within the municipality, however it is reported that 60% of the population live within 500 meters of a bus stop, and 7% of the population have public transportation departing at least four times an hour within this range (ibid.).

In the 2019 local elections, the political parties that acquired the most votes in Ringerike were: the Labour Party (AP) (27%); the Centre Party (SP) (24%); the Conservative Party (H) (19%); and the Progress Party (FrP) (10%) (NRK, 2019a). This is quite similar to the national results where overall, AP obtained 25% of the votes, H got 20%, SP acquired 14%, and lastly, FrP obtained 8% (NRK, 2019b). Out of all the inhabitants in Ringerike there are 24,600 eligible voters, and in the 2019 local elections 59% of them voted (ibid.). During this election, some of the most discussed political issues were regarding decreasing the price of parking in the city centre of Hønefoss, limiting the establishment of high-rise buildings in the city centre, and that the property tax should be decreased (ibid.).

Appendix 3. Survey regarding the thesis for interview respondents

Hei og tusen takk for at du har vist interesse for dette forskningsprosjekt.

Side 1

Prosjektet er en del av en masteroppgave ved Norges miljø- og biovitenskapelig universitet (NMBU). Denne oppgaven vil sette søkelys på å undersøke holdninger og løsninger angående matsvinn fra familier med ett eller flere barn under 18 år. Opplysningene som samles gjennom prosjektet, skal bli brukt for å foreta en analyse og sammenligne data om matsvinnvaner blant barnefamilier i Norge.

Ønsker du å bidra til å finne løsninger på matsvinn blant husholdninger? Da vil jeg gjerne komme i kontakt med deg! Hvis du velger å delta i prosjektet, innebærer det at du stiller til et dybdeintervju. Det vil ta deg ca. 45 minutter. Intervjuet inneholder spørsmål om generelle matvaner, matlaging og matkasting. Svar på spørsmålene under så kontakter jeg deg.

Hva er din e-postadresse?

Hva heter du (fornavn)?

Hva er ditt kjønn?

- Mann
- Kvinne
- Annet
- Vil ikke si

Bor du i Ringerike kommune?

- Ja
- Nei

Har du et eller flere barn under 18 år?

- Ja
- Nei

Er det du som har hoved eller del-ansvaret for matinnkjøp/matlaging hjemme?

- Ja
- Nei

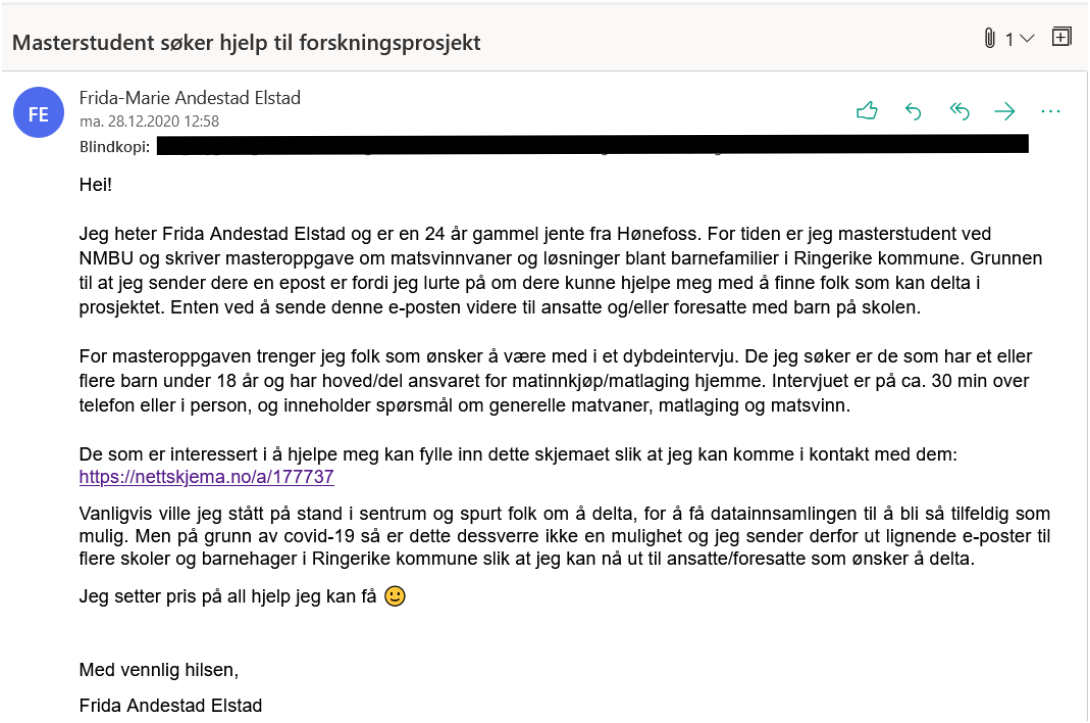
Når passer det deg best å ha intervju?

Hvordan ønsker du å ta intervjuet?

- Via telefon
- Via Skype/Zoom/Teams

Lagre Avbryt

Appendix 4. Email regarding the thesis for interview respondents



Masterstudent søker hjelp til forskningsprosjekt

1

FE

Frida-Marie Andestad Elstad
ma. 28.12.2020 12:58

Blindkopi: [redacted]

Hei!

Jeg heter Frida Andestad Elstad og er en 24 år gammel jente fra Hønefoss. For tiden er jeg masterstudent ved NMBU og skriver masteroppgave om matsvinnvaner og løsninger blant barnefamilier i Ringerike kommune. Grunnen til at jeg sender dere en epost er fordi jeg lurte på om dere kunne hjelpe meg med å finne folk som kan delta i prosjektet. Enten ved å sende denne e-posten videre til ansatte og/eller foresatte med barn på skolen.

For masteroppgaven trenger jeg folk som ønsker å være med i et dybdeintervju. De jeg søker er de som har et eller flere barn under 18 år og har hoved/del ansvaret for matinnkjøp/matlaging hjemme. Intervjuet er på ca. 30 min over telefon eller i person, og inneholder spørsmål om generelle matvaner, matlaging og matsvinn.

De som er interessert i å hjelpe meg kan fylle inn dette skjemaet slik at jeg kan komme i kontakt med dem:
https://nettskjema.no/a/177737

Vanligvis ville jeg stått på stand i sentrum og spurt folk om å delta, for å få datainnsamlingen til å bli så tilfeldig som mulig. Men på grunn av covid-19 så er dette dessverre ikke en mulighet og jeg sender derfor ut lignende e-poster til flere skoler og barnehager i Ringerike kommune slik at jeg kan nå ut til ansatte/foresatte som ønsker å delta.

Jeg setter pris på all hjelp jeg kan få 🙂

Med vennlig hilsen,

Frida Andestad Elstad

Appendix 5. Facebook-post regarding the thesis for interview respondents

Frida Andestad Elstad har delt en lenke.
14. desember 2020 ·

Hei! 😊Jeg er student ved NMBU og skal til våren skrive masteroppgave om matsvinnvaner og løsninger blant barnefamilier i Ringerike kommune. Har du et eller flere barn under 18år, og har hoved/del-ansvaret for matinnkjøp/matlaging hjemme så ønsker jeg å komme i kontakt med deg! Via et dybdeintervju så skal jeg samle informasjon som vil bli brukt for å foreta en analyse og sammenligne data om matsvinnvaner blant barnefamilier i Norge.
Intervjuene vil hovedsakelig ta plass i januar på Ringerike bibliotek eller via en internett/telefon-samtale. Intervjuet inneholder spørsmål om generelle matvaner, matlaging og matsvinn.
Er dette noe du er interessert i? Fyll inn dette skjemaet også kontakter jeg deg snarest via e-post. https://nettskjema.no/a/177737

*Godkjent av administrator!

NETTSKJEMA.NO
Matsvinnvaner og løsninger blant barnefamilier i Ringerike kommune - Nettskjema

Liker Kommenter Del

Skriv en offentlig kommentar ...

Appendix 6. Newspaper Article regarding the thesis

Ringerikes Blad

ØKONOMI OG NÆRINGSLIV MATSVINN RINGERIKE HØNEFOSS

Frida-Marie (24) er ikke i tvil: – Barnefamilier er verstingene

MYE SVINN: – Jeg ønsker å finne ut hvordan vi skal klare å ta vare på mer av maten vi kjøper, sier Frida-Marie Andestad Elstad. Foto: Privat

Av Øyvind Lien Publisert: 10.01.21 12:17 Del

20 husstander i Ringerike oppfordres til å fortelle om sine matvaner – eller rettere sagt avfallsvaner.

Dømmer ingen

Frida-Marie er opprinnelige fra Storløkka i Hønefoss, men er nå masterstudent ved Norges miljø og biovitenskapelige universitetet på Ås. (NMBU)

Undersøkelsen knyttet til matsvinn skal hun gjennomføre i hjemkommunen Ringerike i løpet av de neste ukene.

– Når jeg nå skal samle inn data om dette temaet, er jeg ikke ute etter å dømme noen. Jeg vil bare vite mer om fenomenet, sier hun.

I denne podkasten forteller Frida-Marie om hvorfor hun vil at vi skal redusere matsvinnet:

Barnefamilier er verstingene

Verstingene når det kommer til det å kaste mat, er barnefamilier. Enslige over 65 år er de flinkeste, og kaster lite mat.

Ønsker kontakt

Frida-Marie ønsker kontakt med aktuelle husstander som ønsker å delta i undersøkelsen om egne vaner.

– Jeg ser etter folk som har del- eller hovedansvar for matinnkjøp eller matlaging hjemme, har ett eller flere barn under 18 år og bor i Ringerike kommune. Det kan gjerne være husholdninger som består av single med ett barn eller en stor familie med mange bonusbarn, sier hun.

Frida-Marie kan treffes på mobil 92328007 eller på e-post: fridaelstad@gmail.com.

Appendix 7. Information and Consent Form

Information sheet sent out to all respondents prior to interviews.
The information sheet is approved by NSD.

Vil du delta i forskningsprosjektet

Matsvinnvaner og løsninger blant barnefamilier i Ringerike kommune

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å analysere matsvinnvaner til barnefamilier i Ringerike kommune. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål

Formålet til dette prosjektet er å øke vår forståelse av holdninger til matsvinn og matsvinnvaner blant barnefamilier og undersøke hvilke tiltak som bør iverksettes for å redusere avfallet. Prosjektet er en del av en masteroppgave ved Norges miljø- og biovitenskapelig universitet (NMBU). Denne oppgaven vil sette søkelys på å undersøke holdninger og løsninger angående matsvinn fra familier med ett eller flere barn under 18 år. Opplysningene som samles gjennom prosjektet, skal bli brukt for å foreta en analyse og sammenligne data om matsvinnvaner blant barnefamilier i Norge.

Hvem er ansvarlig for forskningsprosjektet?

Masterstudent ved NMBU, Frida-Marie A. Elstad har ansvaret for prosjektet mens Arild Vatn, professor ved NMBU, er veileder og har overordnet ansvar.

Hvorfor får du spørsmål om å delta?

Du har blitt valgt ut til å delta fordi du har vist interesse for forskningsprosjektet. I tillegg til å ha vist interesse så har du blitt valgt ut grunnet utvalgskriteriene: 1) du har ett eller flere barn under 18 år; og 2) har hoved- eller delansvaret for matvarehandel eller matlaging for familien. Vi har videre spurt rundt 20 personer, som alle møter utvalgskriteriene, om å delta i forskningsprosjektet.

Hva innebærer det for deg å delta?

Hvis du velger å delta i prosjektet, innebærer det at du stiller til et dybdeintervju. Det vil ta deg ca. 45 minutter. Intervjuet inneholder spørsmål om generelle matvaner, matlaging og matkasting. Under intervjuet vil det bli tatt lydopptak og notater, og dine svar blir registrert elektronisk. Vi vil helst at intervjuene skal ta plass på Ringerike bibliotek, men kan være over internett eller ta plass andre steder om det blir mer naturlig (grunnet Covid-19).

Det er frivillig å delta

Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykket tilbake uten å oppgi noen grunn. Alle dine personopplysninger vil da bli slettet. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger

Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket. De som vil ha tilgang til opplysningene vil være Frida-Marie A. Elstad (student) og Arild Vatn (veileder). Frida-Marie er databehandler som skal samle inn, bearbeide og lagre dataene. Arild har tilgang til dataene via Frida-Marie da han er veileder og har overordnet ansvar for forskningsprosjektet. Navnet og kontaktopplysningene dine vil jeg erstatte med en kode som lagres på egen navneliste adskilt fra øvrige data. I tillegg kommer datamaterialet til å være kryptert. I publikasjoner av prosjektet så kommer du ikke til å bli gjenkjent da de type opplysningene som vil bli publisert er generelle funn.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?

Opplysningene anonymiseres når prosjektet avsluttes/oppgaven er godkjent, noe som etter planen er mai 2021. Ved prosjektslutt så blir alt av fysisk materiale makulert og digitalt materiale, som personopplysninger og opptak, slettet.

Dine rettigheter

Så lenge du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke personopplysninger som er registrert om deg, og å få utlevert en kopi av opplysningene,
- å få rettet personopplysninger om deg,
- å få slettet personopplysninger om deg, og
- å sende klage til Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om deg?

Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Norges miljø- og biovitenskapelig universitet har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvor kan jeg finne ut mer?

Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:

- Arild Vatn ved Norges miljø- og biovitenskapelig universitet. (arild.vatn@nmbu.no)
- Vårt personvernombud: Hanne Pernille Gulbrandsen i Deloitte Advokatfirma (personvernombud@nmbu.no).

Hvis du har spørsmål knyttet til NSD sin vurdering av prosjektet, kan du ta kontakt med:

- NSD – Norsk senter for forskningsdata AS på epost (personverntjenester@nsd.no) eller på telefon: 55 58 21 17.

Med vennlig hilsen

Arild Vatn
(Veileder)

Frida-Marie A. Elstad

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet «Matsvinnvaner og løsninger blant barnefamilier», og har fått anledning til å stille spørsmål. Jeg samtykker til:

- å delta i ett dybdeintervju.
- å svare på spørsmål angående matvaner, matlaging og matsvinn.
- å bli tatt opptak av under dybdeintervjuet.

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet

---

(Signert av prosjektdeltaker, dato)

Norges miljø- og biovitenskapelige universitet
Noregs miljø- og biovitskapelege universitet
Norwegian University of Life Sciences

Postboks 5003
NO-1432 Ås
Norway