

The formation of consumers' perception of the quality of dairy in relation to household food waste

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Supervisor: Dr. ir. LPA (Bea) Steenbekkers

Examiner: Prof. V (Vincenzo) Fogliano

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Abstract

The aim of this research is to gain insight into how the consumer's quality perception of dairy is formed and consequently how this influences the consumer's decision to either consume or dispose dairy. The research is demarcated to two dairy products; Dutch semi-hard cheese and neutral yoghurt, and investigates the influence of factors and cues. The factors are identified through a literature study, and include managerial factors, technological factors and quality perception factors. The cues are revealed by conducting interviews, and relate to the technological factors and quality perception factors. A survey is used to investigate the effects of the identified factor and cues. The managerial factors that influence the consumer's quality perception of dairy, and consequently enhance food waste are low perceived household skills, low intention not to waste and low perceived behavioural control. Furthermore, the higher the concern for overweight and the lower the perceived healthiness of the product, the more dairy waste is generated. The technological factors and related cues that influence the consumers' quality perception of cheese are the expiration date as a cue during shopping and crust removal as a factor during storage. The more someone takes the expiration date of cheese into consideration when buying cheese, the more cheese he wastes. Complete removal of a cheese's at the first moment of consumption, reduces the disposal frequency of cheese. A technological factor that influences the consumers' quality perception of yoghurt is its storage location within the fridge; people who consider the location within the fridge when storing yoghurt, dispose less yoghurt. The factors and cues that are relevant for the technological functions are product specific. Food waste of cheese is influenced by the expiration date as a cue during shopping, and crust removal as a factor influencing storage. The more someone takes the expiration date of cheese into consideration when buying cheese, the more cheese he wastes. Complete removal of a cheese's at the first moment of consumption, reduces the disposal frequency of cheese. Food waste of yoghurt is influenced by its storage location within the fridge. People who consider the location within the fridge when storing yoghurt, dispose less yoghurt. The quality perception factors that influence the consumer's quality perception of cheese are some sensory cues. A cheese that is hard and dry or has a deviating smell is likely to be disposed. Yoghurt disposal depends on the sensory cues of the sight of lumps and moulds on the package. Furthermore, the more respondents rely on the expiration date of yoghurt, the more yoghurt is disposed. Finally, the disposal of cheese and yoghurt is higher among younger people and larger households.

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1. Introduction to the research

1.1 Background

The Food and Agriculture Organisation of the United Nations estimated that each year approximately one-third of the food that is produced for human consumption is wasted somewhere in the food production chain (FAO, 2013). Food waste is defined as the discarding or alternative use of food that was originally produced for human consumption (FAO, 2015). These alternative uses of food could for example imply that food is being used as feed for animals (Papargyropoulou et al., 2016).

The production of food impacts the environment by the exhaustion of natural resources (Edjabou, Petersen, Scheutz, & Astrup, 2015). Especially, the production and consumption of food products from animal origin account for large environmental burdens, and result in higher greenhouse gas emissions than food products originated from plants (Bryngelsson, Wirsenius, Hedenus, & Sonesson, 2016; Eberle & Fels, 2016). Therefore, reducing food waste should focus on food products like meat and dairy.

The distinction can be made between avoidable and unavoidable food waste. Unavoidable food waste refers to the non-edible fraction of food, e.g. bones or egg shells (Papargyropoulou et al., 2016; Priefer, Jörisen, & Bräutigam, 2016). Avoidable food waste refers to the discarding of food that is either still edible or not edible anymore due to no timely consumption (Priefer et al., 2016). The minimization of food waste may result in the largest environmental benefits if the focus is on the minimization of *avoidable* food waste (Bernstad Saraiva Schott & Andersson, 2015). Moreover, the weights of avoidable and unavoidable food waste generated in, for example, the UK are respectively 5.3 and 1.5 million tonnes per year, which indicates that the majority of food wasted concerns avoidable food waste (Quested, Parry, Easteal, & Swannell, 2011). The distribution of avoidable and unavoidable food waste among different food categories indicates that the category of dairy primarily consists of avoidable food waste whereas avoidable meat and fish waste only accounts for half of the total meat and fish waste (WRAP, 2009). Hence, this research will focus on the food category of dairy.

Food waste occurs at every level of the food chain; from the primary production of food till the final stage at the household and all stages in between (Monier et al., 2010). However, not all stages contribute equally to the production of food waste. Monier et al. (2010) found that the household sector has a dominant role in the generation of avoidable food waste in the EU. This is confirmed by a research conducted by Priefer et al. (2016), who also recognise the primary production level to be considerably contributing to the total food waste generation, i.e. without distinguishing between avoidable and unavoidable food waste. The fact that Monier et al. (2010) did not point out the primary production level as dominant in the generation of food waste, could be because the research did not cover this level. Monier et al. (2010) also found that the manufacturing sector accounts for a large part in the production of food waste. However, the food waste that is generated during manufacturing is primarily unavoidable (Monier et al., 2010). Moreover, the results show that the food waste generated by the household sector accounts for the largest environmental impact, in comparison to other sectors (Monier et al., 2010). Generally, the later a food item is wasted in the chain, the larger the environmental impact (Gruber, Brandstetter, Bos, Lindner, & Albrecht, 2016; Nemecek, Jungbluth, Milà Canals, & Schenck, 2016). By definition, household food waste occurs at the end of the chain, and thus has undergone all the preceding steps in the chain. These do not only include the steps of production, which require resources and cause the release of emissions, but also the steps at the household level. The acts of shopping, storage and in some cases preparation of food have an impact on the environment, which all are wasted in case the food is not used for human consumption (Gruber et al., 2016). Its environmental impact and dominance in the generation of avoidable food waste indicate that it is important to focus on the minimization of household food waste.

The economic definition of consumption refers to the purchase of goods for final use ("Consumption - definition of consumption by The Free Dictionary," n.d.). However, when referring to consumption in this research, the act of eating and drinking is understood.

The minimization of household food waste is restrained by the consumers' concern for food safety. Food safety may be threatened during all levels in the production chain of food. However, at the consumption level in the chain, where control is absent, the food safety is considered to be at risk at a considerable extent (Terpstra, Steenbekkers, Maertelaere, & Nijhuis, 2005). Although people often feel guilty about throwing food away, their concern for food safety pulls them in the opposite direction of disposing food that is considered to be unsafe (Watson & Meah, 2012). The tension between food waste and food safety is mainly present at the moment when food crosses the line from being food to being waste.

What distinguishes something from being food to being waste? According to Blichfeldt, Mikkelsen, & Gram (2015), consumers classify food as edible or inedible; once consumers no longer perceive food as edible, it gets wasted. The consumer's perception of edibility, also referred to as cultural edibility, depends on what is learned in early life as acceptable to eat. Hence, it differs from person to person what is perceived as inedible, and consequently gets wasted (Blichfeldt et al., 2015; Watson & Meah, 2012)

Besides cultural edibility, a food's edibility can also be stated in terms of food safety. Blichfeldt et al. (2015) refer to this as biological edibility, however, the safety of food does not purely depend on biological hazards. The food safety concepts implies also the absence of chemical and physical hazards (Luning & Marcelis, 2009). Therefore, for the purpose of this research, the concept is replaced by 'edibility in terms of food safety', which covers biological, chemical and physical edibility.

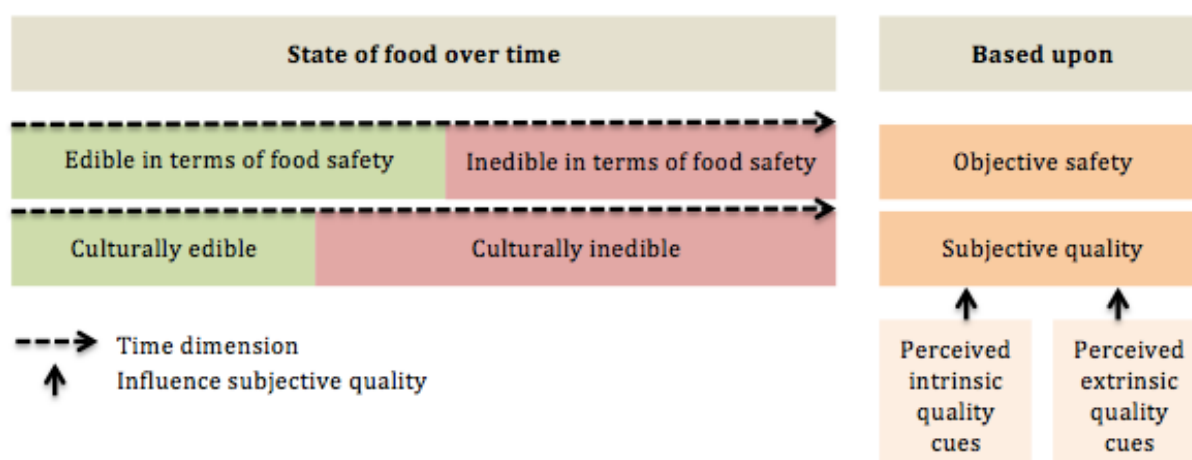


Figure 1: State of edibility of food over time, represented for both objective safety and subjective quality.

Figure 1 provides an overview of the changing state of food over time, expressed both for edibility in terms of food safety, and for cultural edibility.

As time passes, a food's properties evolve, resulting in several stages of decay. During the first stages of decay, a food can still be safe for consumption. Edibility in terms of food safety is based upon objective food safety, a concept to which Grunert (2005) refers to as based on the scientific risk assessment of consuming the food. However, objectively edible foods might not comply with the consumers' ideas on acceptability to eat, and may be perceived as inedible (Blichfeldt et al., 2015; Van Boxtael, Devlieghere, Berkvens, Vermeulen, & Uyttendaele, 2014). Since a food can be culturally inedible while it has not yet reached the state in which it is unsafe for consumption, there can be argued that cultural edibility is not solely based on a judgement about safety; rather it is based on a judgement about quality. This is supported by the fact that consumers dispose food based on their perception of the desirability of the food; if a food product is perceived as relatively undesirable in comparison to what is considered as optimal, it gets wasted

(Aschemann-Witzel, de Hooge, Amani, Bech-Larsen, & Oostindjer, 2015). Grunert (2005) also distinguishes the concept of quality between objective and subjective quality. Cultural edibility is based on subjective quality, since consumers do not have the ability to objectively determine a food's quality. Therefore, they judge a food's edibility on its subjective quality, i.e. their quality perception of the food.

In order to analyse consumer perception on food quality, Grunert, Larsen, Madsen and Baadsgaard (1996) developed the Total Food Quality Model (Appendix I). The model describes how consumers form quality expectations before purchase, and how consumers experience quality after purchase. However, the elaboration on the perception of quality after purchase is limited. The model does not describe the formation of a quality perception in the consumers' decision to consume or not consume a food. Although the model is not developed to analyse quality perceptions in relation to food waste, it can still be assumed that the model is useful in analysing the formation of consumer's quality perception. The model indicates that the consumers' expected quality is formed by both the perceived intrinsic quality cues and the perceived extrinsic quality cues, which is visualized in Figure 1. Intrinsic quality cues are the information pieces that consumers use in the formation of a quality perception that derive from the physical product features. In other words, intrinsic quality cues cannot be manipulated without changing the physical product. In contrast, extrinsic quality cues are not directly related to the physical product features, thus can be manipulated without adjusting the physical product (Olson & Jacoby, 1972). What will be adjusted in order to change the extrinsic quality cues are a product's production and marketing aspects (Luning & Marcelis, 2009).

The perceived intrinsic and extrinsic quality cues suggest that in the formation of a quality perception, three elements that influence this process must be taken into account. First of all, the product influences the consumers' quality perception, which the model indicates by the intrinsic quality cues. Secondly, the extrinsic quality cues point to the producers as an influencing element, through the production and marketing aspects of a food product. The final element in the formation of a quality perception is the consumer. The consumer perceives the cues and forms the perception, and therefore also has an influence on how the perception is formed.

It is important that the consumer's perception of the quality of a food item is close to the food's actual quality, as this prevents unsafe foods to be consumed while it minimizes avoidable food waste. However, consumers tend to dispose food before it reaches the state of being inedible in terms of food safety (Blichfeldt et al., 2015). This results in the generation of a particular category of avoidable food waste, which is *unconsumed food*. Unconsumed food refers to disposed food that is still edible in terms of food safety at the moment of disposal (Gruber et al., 2016). Aschemann-Witzel et al. (2015) refer to this category of food waste as "suboptimal food", i.e. food that is undesired because they deviate from what is considered as optimal. Although the size of this category is unknown, the prevention of unconsumed food can significantly reduce the environmental impact (Gruber et al., 2016).

The category of unconsumed food can be reduced if the state at which consumers perceive food as inedible is more near to the state at which food is inedible in terms of food safety. Consumers' concerns for food safety causes the state at which they perceive food as inedible to be earlier than the food is actually unsafe for human consumption. Therefore, to avoid waste, consumers should delay the moment at which they consider food as inedible. However, if this moment would be delayed too much, there might be the risk that unsafe food is still consumed, which can potentially cause a food-borne disease. In order to reduce food waste of unconsumed food, insights are required into how consumers form their perception on the edibility of food, and how the moment at which food is considered as waste can be delayed while taking into account the food safety concerns.

As indicated earlier, the research will focus on the category of dairy, due to the environmental impact of its waste (Eberle & Fels, 2016). Moreover, only a negligible minority of the waste in

the combined category of dairy and eggs is unavoidable, which indicates that much can be gained in the category of dairy (Quested et al., 2011). Another argument for focussing on dairy is that the consumer's quality perception is of particular importance in the disposal of dairy products. The vast majority of avoidable dairy waste in households is wasted in its purchased state (97.4%) (WRAP, 2008).

From this background information follows the main research question, formulated specifically for the category of dairy: *What determines the consumer's quality perception of dairy and consequently his/her decision to either consume or dispose dairy?*

1.2 Demarcation

This research focuses on avoidable household food waste in the category of dairy. Figure 2 depicts an overview of the possible reasons for the avoidable disposal of food at the household level in the chain, split per state of the food at the moment of disposal.

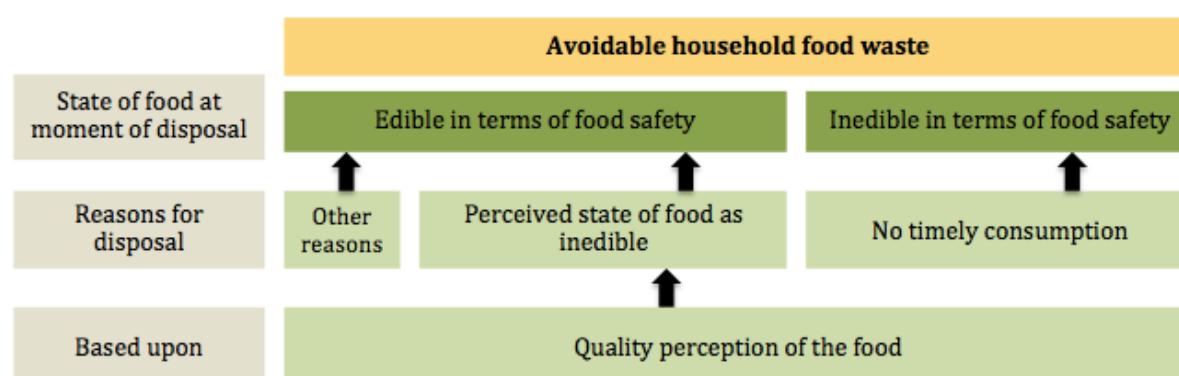


Figure 2: Reasons for avoidable food waste, according to state of the food at the moment of disposal.

The top of the figure depicts a categorization of avoidable household food waste based on the state of food at the moment of disposal, either edible or inedible in terms of food safety. The research will be demarcated to disposed food that is still edible in terms of food safety at the moment of disposal, also referred to as unconsumed food. The main reason for disposal of edible foods is because it is perceived as inedible, which is based upon subjective quality (Aschemann-Witzel et al., 2015). The formation of the perception of the subjective quality of a food will be the main focus of this research. Other reasons for disposal of edible foods can be a dissatisfaction with the taste of food (Lyndhurst, Cox, & Downing, 2007), personal preferences, e.g. disposal of bread crusts (Monier et al., 2010), no space in the fridge or no recipe for using leftovers (Watson & Meah, 2012). However, these other reasons for disposal of edible food will not be addressed in this research. Inedible food in terms of food safety at the moment of disposal will also not be the main focus in this research. However, the reason for disposal of inedible food in terms of food safety may play a role in the perception formation on the quality of food. By definition, all avoidable food waste has once been edible, so the reason for disposal of food that is inedible at the state of disposal is due to no timely consumption (Priefer et al., 2016). Food was allowed to reach the state of inedibility in terms of food safety, due to consumers' food handling behaviour (Quested et al., 2011; Terpstra et al., 2005). The knowledge that consumers have concerning their food handling might influence their quality perception of the food.

In order to gain insight into the formation of the consumer's quality perception of dairy, there is demarcated to the influence of factors and cues. Factors that influence the formation of the consumer's quality perception refer to the aspects that influence the product's properties, or the aspects that directly influence a consumer's quality perception. Cues are informational signals that consumers use in the formation of a perception (Steenkamp, 1990). Within the category of dairy there will be further demarcated specific food products. Almost four fifths (78%) of the total weight of avoidable dairy waste generated by households in the UK is attributable to

cheese, yoghurt and milk; respectively 21.3%, 36.0% and 21.5%. However, the costs of avoidable dairy waste are especially high for cheese and yoghurt; respectively 44.2% and 30.3%, versus 5.2% for milk (WRAP, 2008). Another argument for selecting cheese and yoghurt over milk is the perishability. Milk is a highly perishable product, while yoghurt and cheese have a longer shelf life (Cammelbeeck, 2013; Sepulveda & Esparza-Chavez, 2016). Hence, the judgement of the edibility of milk is more a matter of a safety perception than a matter of quality perception. As the focus of this research is on food quality perception in relation to food waste, the focus is cheese and yoghurt.

The cheese is sold in various variations. Within the scope of this research fall hard and semi-hard Dutch cheese, sold in pieces, sliced or grated. The yoghurt that this research focusses on is neutral yoghurt, meaning without an added flavour.

To sum up, the scope of this research is the problem of unconsumed cheese and yoghurt at the household level. The main reason for this problem is that consumers perceive the cheese and yoghurt as inedible, which is based upon their quality perception of the food. Therefore, insights are required into how the consumer's quality perception is formed, by which there is focussed on the influence of factors and cues.

1.3 Objective and research questions

The aim of this research is to gain insight into how the consumer's quality perception of dairy is formed and consequently how this influences the consumer's decision to either consume or dispose dairy. The aim will be achieved by investigating the formation of consumers' quality perception of food in general and specifically of two dairy products, i.e. cheese and yoghurt.

Several sub questions are formulated. The first question relates to food in general and the second and third question are specifically formulated for the products of cheese and yoghurt:

- Which factors determine the consumer's quality perception of food in relation to household food waste?
- Which cues do consumers use to form their perception on the quality of cheese and yoghurt?
- How do the identified factors and cues influence the consumers' decision to consume or dispose cheese and yoghurt?

The first question will be answered by means of a literature review, which results in a theoretical framework with factors that determine the consumer's quality perception of food in relation to household food waste. The second sub question is answered by conducting interviews among consumers who consume cheese and yoghurt on a regular basis. This provides a list of cues that consumers use in order to form their quality perception. The third sub question is answered by means of a survey that combines the identified factors and cues. This provides insights into how the identified factors influence the consumers' decision to consume or dispose cheese and yoghurt.

1.4 Outline of the report

After this first chapter follows a literature review about the main concepts that fall in the scope of this research, e.g. food quality, perception. Also the current knowledge about the reasons and factors of food waste is discussed. The chapter ends with a theoretical framework for the formation of a quality perception of food in relation to food waste, which answers the first sub question. The third chapter covers the second sub question. It contains a description of the research methodology that is used for answering the second sub question, followed by a description of the results and a discussion of the results on their relevancy to food waste.

The fourth chapter addresses the final sub question. Again, this chapter starts with a description of the respective research methodology, followed by description of the results, and a discussion of the results. In this discussion section the results are critically reflected and related to the literature. The report ends with a concluding chapter and a critical reflection.

2. Literature review

2.1 Food quality perception

The concept of food quality has various interpretations and definitions. A definition that is commonly used is “the requirements necessary to satisfy the needs and expectations of the consumer” (Peri, 2006). There can be distinguished between objective and subjective quality. The objective quality of a food concerns its physical features, while subjective quality refers to the consumer’s perception of the food’s quality (Grunert, 2005). The core of quality is in the relationship between objective and subjective quality; a food’s physical features should enable the consumer to infer desired qualities, which should satisfy their needs (Grunert, 2005). The consumers’ judgement on the edibility of a food is based on subjective quality, since in general consumers do not have the ability to objectively determine the food’s physical features.

2.1.1 Quality dimensions: search, experience and credence

Quality dimensions are commonly categorized into search, experience and credence dimensions (Darby & Karni, 1973). The distinction is based upon whether and when the consumer can ascertain the quality of the dimensions. The quality of search dimensions can be ascertained at the moment of purchase, like the appearance of a product. The quality of experience dimensions can be ascertained only after purchase, like the taste of a product. Finally, the quality of credence dimensions can never be ascertained by the average consumer; instead consumers have to trust the judgement of others (Grunert, 2002). Although these three dimensions concern quality perceptions in relation to purchase criteria in food choice, they can be applied to quality perception in relation to food waste. An important search dimension in relation to food waste could be the food’s expiration date, or other information about the preservability of the product. The experience dimensions that are important in relation to food waste could imply the sensorial aspects of the products that consumers use in order to judge the food’s quality. An example of a credence dimension in relation to food waste is food safety (Röhr, Lüddecke, Drusch, Müller, & Alvensleben, 2005). The search and experience dimensions in relation to food waste seem to be covering food safety too, however, the objective safety of a food is a dimension that an average consumer can never ascertain. Instead, consumers depend on the provided product information, which is distinctive for credence dimensions (Röhr et al., 2005).

There is some disagreement about whether food safety is a dimension of food quality. The main issue in this view is that the way in which food safety influences quality is different than other dimensions of quality. Due to its importance, food safety judgement may be expected to be more determining for a quality perception than other dimensions of quality. Surprisingly, it seems that under normal circumstances, food safety plays only a minor role in consumers’ formation of a quality perception. However, in case of major safety problems, safety perceptions can dominate over all other quality dimensions (Grunert, 2005). Again, the validity of these findings for consumer’s quality perception in relation to food edibility should be questioned, since the results relate more to purchase criteria in food choice. In order to gain a better understanding in the quality attributes consumers use as cues in the formation of the food’s quality in relation to food edibility, there can be looked at the reasons that explain why food is wasted.

2.1.2 Quality dimensions: hedonic, health, convenience and process

Another categorization of quality dimensions, which specifically concerns food products, is into hedonic, health-related, convenience-related and process-related dimensions (Grunert, et al., 1996). Hedonic quality refers to the sensorial aspects of food products. The health-related quality dimension of a food product refers to the effects of its consumption regarding the consumers’ physical health. The convenience-related quality dimension covers the time and effort that are required for its storage, preparation and consumption. Process-related quality

refers to the product's production process, e.g. organic production (Grunert, Bech-Larsen, & Bredahl, 2000).

This categorization is based on consumers' motivations to choose one food product over another; an issue of which there is argued that its explanation lies in the means-end approach to consumer behaviour (Reynolds & Olson, 2001). This approach assumes that consumers buy a product when it can serve as a mean towards their ends, which implies that the product will help them in attaining their goals or values. Hence, consumers recognise the concrete product's features as a mean towards abstract life values. It is argued that the product's features serve as a cue from which consumers infer quality (Grunert, 2005). However, it can be expected that also other information can serve as cues in the formation of a quality perception, e.g. consumers' knowledge on how long the product has been open. The hedonic, health-related, convenience-related and process-related quality dimensions form the bridge between the product's cues and the abstract values (Grunert, 2005). An example that illustrates this can be the products' fat content. Fat content is a concrete product feature, which serves as a cue for inference making. Consumers infer from this cue how the product scores on the dimensions, e.g. when the fat content is high, it scores weakly on the health dimension. Consequently, the consumer assesses how this consents in attaining his goals and values, e.g. good health or long life. From this follows the consumers' quality perception of the product. However, the process itself is not as active and conscious as it might be suggested here.

Besides that the categorization of quality dimensions into hedonic, health-related, convenience-related and process-related aspects applies to food quality in general, Grunert et al. (2000) argue that this categorization also applies particularly to dairy products. None of these dimensions can be ascertained before purchase, which implies that the quality perception of dairy is only based on experience and credence dimensions (Grunert et al., 2000). This only applies to the formation of a quality perception in order to decide whether or not to buy a product, and whether or not a product will be bought again.

2.1.3 Total Food Quality Model

As mentioned before, in order to analyse consumers' perception on food quality, Grunert, Larsen, Madsen and Baadsgaard (1996) developed the Total Food Quality Model. Grunert (2005) slightly adapted the model, which is depicted in Appendix I. The model provides an explanation for the formation of consumer's quality perception, which consequently explains consumers' intentions to buy a product and possible future purchases. This is achieved by combining several dimensions of quality, mainly distinguishing between a horizontal and a vertical dimension.

The horizontal dimension relates to time, and thus to a products' search, experience and credence dimensions (Grunert, 2005). The model differentiates the formation of a quality perception in a before and after purchase situation. In the before purchase situation, the quality cues are used to form a quality expectation, which determines the consumers' intention to buy the product. This is mainly based on the products' search dimensions of quality, as the quality of these dimensions can be ascertained before purchase (Grunert, 2002). In the after purchase situation, the quality expectation alters into a quality experience, which influences the consumers future purchases. In this situation, the experience dimensions are more relevant. The vertical dimension of the model relates to the hedonic, health, convenience and process quality dimensions (Grunert, 2005). The consumers' intentions to buy or future purchases are not only dependent on the time related dimensions, but also on whether the product conforms to a consumers' life values. Consumers assess this by inferring quality from the products' attributes that serve as cues (Reynolds & Olson, 2001).

A limitation in the Total Food Quality Model is that it does not explain the formation of a consumer's quality perception in relation to consumer's decisions to not consume, and consequently dispose a food. However, this may be incorporated in the model by elaborating on the formation of consumers' quality perception after purchase. There are several elements in the model that require an elaboration.

First of all, the current Total Food Quality Model seems to assume that every purchased product is consumed, since the consumers' quality perception after purchase depends on the quality

experience (Grunert, 2005). The model would be more realistic if the consumption of a product is incorporated as a choice, which depends on consumers' quality perception.

Secondly, there should be elaborated on the formation of a quality perception that influences the consumer's decisions to consume a food. According to the model, the consumers' quality perception only determines the consumers' intention to buy and future purchases. However, also the consumers' judgement on whether a product is consumed depends on the consumers' quality perception (Aschemann-Witzel et al., 2015), which should be incorporated in the after purchase situation. This requires an elaboration of the quality cues. The current model assumes that consumers only use these cues in the formation of a quality perception in situations before purchase. However, consumers also form quality perceptions after purchase, in which the cues play a role.

Furthermore, the current model recognises some influence of consumer food handling on the consumer's quality perception, referred to as "household production" or "meal preparation" in an earlier version. However, other food handling behaviours at the household level are not incorporated in the model, while these may also have an influence on the consumer's perception of quality.

In order to extend the model with a quality perception that determines the consumer's decision on consumption, more insights are needed into how the quality perception of food in relation to food waste is formed. Therefore, there can be looked into the reasons for the generation of food waste.

2.2 Reasons for the generation of food waste

Literature points to multiple reasons that help to explain food waste. In order to gain better understanding in these reasons, there will be differentiated between the drivers of food waste and the immediate reasons of food waste. The drivers of food waste allow a food item to reach a state at which its perceived quality is not complying with the consumer's standards. The immediate reasons of food waste reflect the reasons why a food's subjective quality does not comply with the standards, and thus why a food item is discarded (Jörisen, Priefer, & Bräutigam, 2015).

2.2.1 Drivers of food waste

There are multiple drivers that can allow food to reach the line from where it is considered as waste. There will be elaborated on the drivers that arise during the route that food follows at household level.

Terpstra et al. (2005) investigated consumer food handling behaviour regarding food storage and disposal, and its effect on food-borne diseases. They identified the steps that food follows after its purchase. These steps include; transport, storage of unopened/fresh product, preparation, storage of opened/partly cut product, storage of prepared product, consumption and disposal. A food does not necessarily follow all these steps, as it might for instance already be consumed directly after preparation.

In addition to these steps that food may follow after purchase, there are also steps preceding its purchase that can play a role in the transformation of food to waste. Quested et al. (2011) identified a set of food handling behaviours that can together influence food waste. These behaviours relate to the activities of: planning, shopping, storage, preparation and consumption of food. This suggests that Quested et al. (2011) acknowledge that food follows a route through the consumer's home, however the route is extended by steps that happen before and during purchase. Contrary to the findings of Terpstra et al. (2005), the behaviours related to the transportation of food, carried out directly after purchase, are not identified as food waste influencing behaviours.

A part of the findings of Terpstra et al. (2005) and Quested et al. (2011) gets supported by a research conducted among Danish households (Stancu, Haugaard, & Lähteenmäki, 2016). This research aimed to identify the determinants of consumer food waste. They found that food-related routines contribute largely to explaining food waste behaviour and thus should be

considered as a driver of food waste. The included routines were shopping, leftover reuse and planning, as were also found by Terpstra et al. (2005) and Qvested et al. (2011).

Figure 3 depicts a visual presentation of the route that food follows at household level, described in terms of the relevant consumers' activities. As stated before, the household level starts

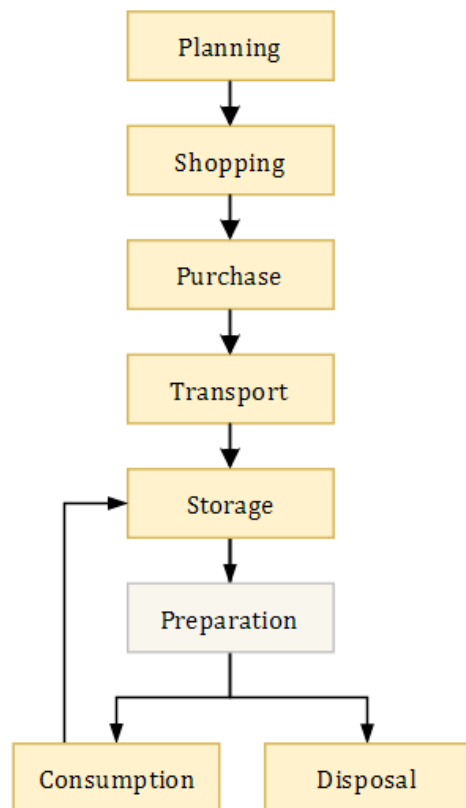


Figure 3: The route that food follows at household level. Adapted from Qvested et al. (2011) and Terpstra et al. (2005).

already before the food has been in contact with the consumer, in terms of planning. The behaviours related to these activities can allow food to reach the line from where it is considered as waste. Therefore, these behaviours can be seen as “drivers” of food waste (Lyndhurst et al., 2007).

The act of planning is argued to be an explaining factor in the generation of food waste (Qvested et al., 2011; Stefan, van Herpen, Tudoran, & Lähteenmäki, 2013). Planning implies e.g. checking inventory levels or making shopping lists. These behaviours can influence food waste because its execution can prevent the purchase of unnecessary food items (Stefan et al., 2013).

The shopping itself also might influence the amount of food wasted. A negative effect of consumers' shopping routines on food waste can result from buying too much or unnecessary food products (Stefan et al., 2013). Both Terpstra et al. (2005) and Qvested et al. (2011) do not recognise the food's purchase as an influencing factor on food waste. This could be due to the fact that a purchase only covers

the products' acquisition, which implies that the decisions on what will be purchased have already been made during the preceding stages of planning and shopping.

After purchase, food items undergo the stage of transportation. The food's transport influences the generation of food waste, by the increasing chance that the product is kept under inappropriate conditions (Terpstra et al., 2005).

The storage of food also influences the generation of food waste. An inadequate storage allows foods to quicker reach the state of inedibility in terms of food safety, which is a reason for disposal (Jörissen et al., 2015). Moreover, careless food storage management can lead consumers to forget which products are stored in their fridge, which also allows food to expire (Koivupuro et al., 2012).

Some food products require preparation before they can be consumed. The act of preparing food influences the generation of food waste by an overestimation of the amount of food that needs to be prepared or inadequate food preparation (Jörissen et al., 2015; Koivupuro et al., 2012). If consumers prepared too much food for direct consumption, it can be restored as leftovers. Koivupuro et al. (2012) found that a common explanation for food waste is that consumers do not consume their leftovers. Moreover, the influencing factors during the storage of unprepared products do also count for the storage of leftovers, i.e. this should be managed and done under adequate conditions. Other factors that can influence food to allow to reach the state of inedibility during preparation can be the possibility of cross contamination or insufficient heating which causes risks for consumption.

The route that food follows at household level also includes consumption (Terpstra et al., 2005). Consumption cannot be considered as a driver for the generation of food waste, because the act

of consuming a food product implies that the product is not disposed. A reason for food waste during consumption can be a dissatisfaction with the taste (Jörissen et al., 2015; Koivupuro et al., 2012). However, this should be considered as an immediate reason for food waste, as it can be an immediate reason to discard food.

Finally, the disposal itself is not recognized as a driver of food waste. There can be expected that the decision on a food's disposal has been made in the preceding stages, which applies to the act of food purchase as well.

Therefore, the stages in the route that are considered relevant for food waste are planning, shopping, transport, storage and preparation. After these stages the consumer decides about whether he consumes or disposes a product.

2.2.2 Immediate reasons for food waste

The drivers of food waste do not explain why, at a certain moment, a food crosses the line from where it is considered as waste. According to Jörissen et al. (2015), the latter is explained by the immediate reasons for food waste. As mentioned before, a dissatisfaction with the taste can be considered as an immediate reason for food waste (Jörissen et al., 2015; Koivupuro et al., 2012). The most important reason to discard food is that it has reached its expiration date, or that it looks, smells, tastes bad/mouldy (Jörissen et al., 2015; Lyndhurst et al., 2007).

According to Evans (2011) food is considered as waste once it is evaluated as 'past its best'. Although 'past its best' does not necessarily point to a concern for food safety, the bases of the evaluation that Evans (2011) found, do suggest the underlying mechanism to be a concern for food safety. The evaluation is based upon expiration dates, sensory perception or knowledge about how long the food product's package has been open. Another base is the consumer's perception of the riskiness of a food product, as some foodstuffs are regarded as more risky than others. Typical high risk products are meat, poultry, fish and dairy. Moreover, Evans (2011) found that it varies across people and foodstuff how food is evaluated, however, the possible health risks of the consumption of food, and thus a food safety concern, generally leads to a quicker evaluation of food as 'past its best'.

2.3 Factors influencing food waste

Besides the reasons for the generation, that are either related to consumer food handling behaviours on the route that food follows at household level, or to the immediate reasons to dispose a food, there are other factors that influence the generation of food waste. These factors may also play a role in consumers' formation of a quality perception.

First of all, psycho-social factors influence food waste. It is shown that consumers' perceived behavioural control affects the generation of food waste (Stancu et al., 2016; Stefan et al., 2013). Perceived behavioural control is a concept that supports explaining people's behaviour according to the Theory of Planned Behaviour. It refers to people's perceived capability of performing a particular behaviour, in terms of ease or difficulty (Ajzen, 1991). Perceived behavioural control in relation to food waste implies consumers' perception of the degree to which they can reduce food waste. Stefan et al. (2013) found that perceived behavioural control contributes in explaining food waste through its indirect effects on consumers' planning and shopping activities. To illustrate this, a consumer who perceives reducing food waste as easy, is more likely to check inventory levels or make shopping lists and less likely to buy unnecessary products, which positively influences the amount of food waste that is generated. Another psycho-social factor that influences food waste is the consumers' intention not to waste food. This factor negatively influences food waste; the higher one's intention not to waste food, the less food he wastes (Stancu et al., 2016; Stefan, 2013). Another factor that contributes to explaining the generation of food waste is people's perception of their household skills. This refers to people's confidence in their performance on food handling activities, like e.g., cooking, planning. The effect of perceived household skills is indirect through its effect on food handling activities. For example: the skill of planning meals, influences how the meals are planned (food-related routine), which consequently influences food waste (Stancu et al., 2016). Finally, a factor related to people's health can influence household food waste. Block et al. (2016) argue that

people can experience a conflict between a food waste reduction goal and weight loss or other health related goals. The latter can cause people to impose themselves a diet, i.e. restricting themselves from foods that are deemed unhealthy. Consequently, the disposal of foods to which they restricted themselves feels as an accomplishment, as it reflects progress of attaining their health related goals. Therefore, people's health concern is considered as a factor that can influence people's household food waste. In line with this reasoning, Block et al. (2016) argue that food waste can be different for foods that are perceived healthy compared to foods that are perceived as unhealthy. Another factor that Block et al. (2016) recognize is the extent to which people find a food appealing. Tempting foods are less likely to be wasted, because they get consumed sooner. Hence, the perceived healthiness and tastiness of a product are factors that are considered in their effect on food waste.

Secondly, there are also socio-demographic factors that correlate with food waste. The most important socio-demographic factors that influence the amount of household food waste are household size and age (WRAP, 2008). It appears that in general the amount of waste generated per person decreases with an increasing household size (Stancu et al., 2016; Williams, Wikström, Otterbring, Löfgren, & Gustafsson, 2012). Single household persons generate the most waste per person (Jörissen et al., 2015; Koivupuro et al., 2012; WRAP, 2008). The effect of age turns out to be negative, i.e. younger consumers are associated with higher amounts of food waste (Stancu et al., 2016; WRAP, 2008). In addition to household size and age, Stancu et al. (2016) recognize income as a determining factor for the generation of food waste. They found a positive relationship with the amount of food waste, which implies that consumers with high incomes are expected to generate a higher amount of food waste in comparison to consumers earning less. However, the correlation with between food waste and income is not always acknowledged (Koivupuro et al., 2012; Williams et al., 2012).

2.4 Food quality perception and food waste

The formation of consumers' food quality perception in relation to food waste is based on several cues. From this quality perception originates people's judgement on the edibility of food, and consequently, either consumption or disposal. The reasons for food waste reveal some indication on the cues that consumers use in order to form their perception on the quality of a food product in relation to food waste. In addition, a research about people's judgement of the edibility of food, provides an insight in potential cues (Van Boxtael et al., 2014).

First of all, people's judgement of the edibility of food is based on smell and appearance, and taste. Consumers compare the information from their senses to their quality expectations, and judge whether the product conforms to the desired quality (Van Boxtael et al., 2014). This conforms with one of the most important immediate reasons for food waste, i.e. disposal when a food product looks, smells, tastes bad/mouldy (Jörissen et al., 2015; Lyndhurst et al., 2007). Hence, consumers' sensory perception of a product is important in the formation of quality perception in relation to food waste. Sensory perception can be transformed into cues by identifying the concrete features that provide the information for the sensory perception. By definition, sensory perception is based on the senses, so the necessary cues in order to form a sensory perception are the product's appearance, taste, smell and sound.

Secondly, the edibility is checked by a judgement of the expiration date (Van Boxtael et al., 2014). This conforms with the other most important immediate reason for food waste, which is that a food has reached the expiration date (Jörissen et al., 2015; Lyndhurst et al., 2007). Van Boxtael et al. (2014) indicate that the expiration date is judged and used in deciding a product's edibility, whereas Jörissen et al. (2015) and Lyndhurst et al. (2007) suggest that an exceeded expiration date is by definition a reason for considering a food as inedible. The latter cannot be reasonably assumed, since consumers do not blindly follow a product's expiration date. Consumers can still consider products as edible although the expiration date has exceeded (Marklinder & Eriksson, 2015). Therefore, there can be concluded that consumers take the date into account as one of the cues on which they base their judgement, but purely an expiration date is not determining consumers' judgement on the edibility of food. Nevertheless, these

researches provide enough evidence to conclude that a product's expiration date serves as a cue in the formation of a quality perception.

Another immediate reason for evaluating a food product as 'past its best' is the product's perceived riskiness. The product's perceived riskiness cannot be easily transformed into cues, since it is expected to be more based on the consumers' experience and memory, than on concrete product features. Although the product features serve as cues in order to allow the product to be categorized as e.g. cheese or yoghurt, the riskiness that the consumer associates with this product comes from experience and memory. Nevertheless, the product's perceived riskiness is expected to play a role in the formation of a quality perception in relation to food waste.

Another approach that consumers use in their judgement on the edibility of food is that once they froze the product, they assume no problems concerning the product's freshness and durability (Van Boxtael et al., 2014). This finding suggests that consumers' knowledge about the handling of their food influences their quality perception. This finding is supported by the last base that Evans (2011) found for the evaluation of a food product as 'past its best', i.e. the knowledge about the time that the product has been open. Hence, there may be expected that the formation of a quality perception can also be found in the drivers of food waste, i.e. what the product has undergone during the consumers' food-related activities.

2.5 Theoretical framework of the formation of food quality perception in relation to food waste

The literature review provides input for a theoretical framework for the formation of consumers' quality perceptions in relation to the problem of avoidable household food waste, as depicted in Figure 4. The theoretical framework addresses the problem as a Food Quality Management problem, according to the research approach proposed by Luning and Marcelis (2009). Although the Food Quality Management approach is designed for detecting causes of quality problems in companies, the approach is applied for household food waste in order to structure the managerial and technological character of the problem. The approach is adjusted to this problem by considering the consumer as the company who deals with a food product.

The problem of avoidable household food waste is divided into technological and managerial functions, which together influences the properties of the product. The consumer forms a quality perception based on the product's properties, and decides to either consume or dispose the food product.

The technological functions identified for this problem are the stages in the route that food follows at the household that are relevant for food waste and in which there is physical contact with the product. The physical product is considered a requirement for a stage to be considered as a technological function, because physical contact technologically influences the product properties. This explains why planning is not considered as a technological function. Disposal and consumption are presented as not directly influencing the product properties, however, they are considered as technological functions because the consumer physically contacts the product during these acts. Left over reuse is incorporated in the framework by the arrow that runs from consumption to storage, indicating that if food is not consumed, it can be stored again. However, a part of the food that was intended for consumption can still be disposed, as shown by the arrow that runs from consumption to disposal. The managerial function for this problem is described as spoilage prevention. The managerial functions that Luning & Marcelis (2009) recognize are not suitable to the current study, because those are relevant for companies whereas the current study focuses on households. Spoilage prevention seems an applicable managerial function, as this influences how consumers handle during the technological functions. However, it should be considered that consumers might not consciously deal with the spoilage prevention of their food.

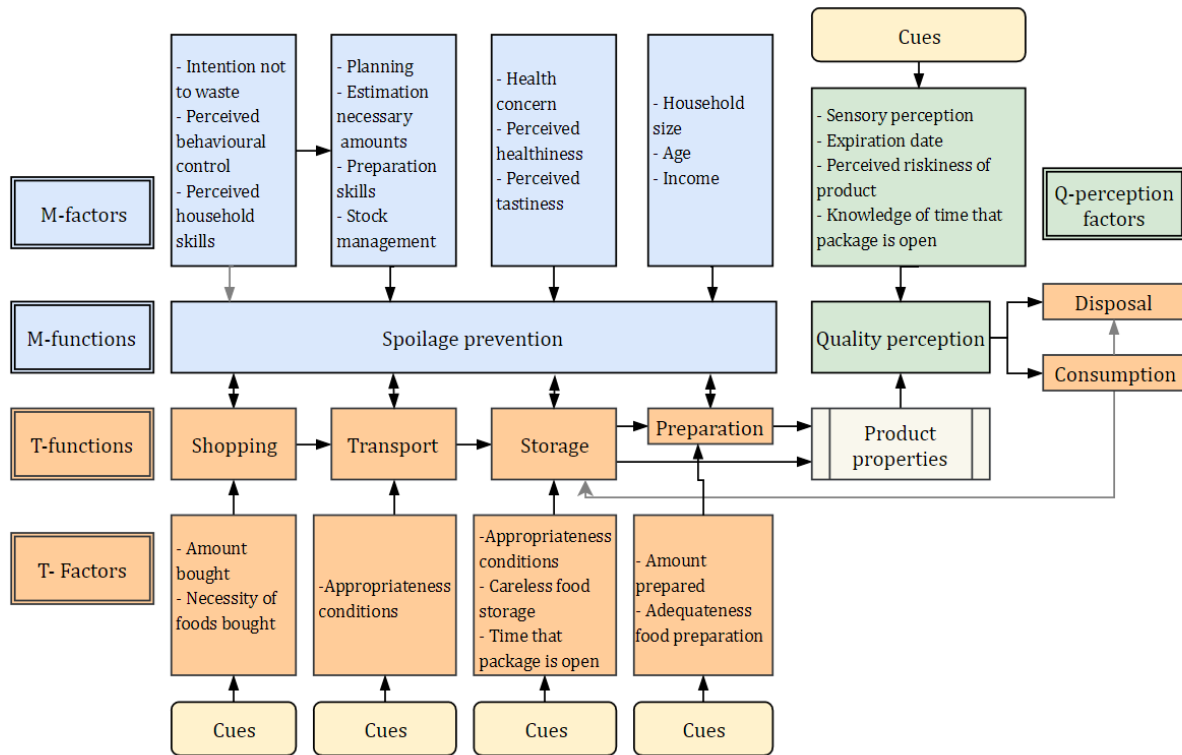


Figure 4: Theoretical framework for the formation of consumers' quality perception in relation to the problem of avoidable household food waste, based on relevant managerial (blue) and technological (orange) functions.

The technological and managerial functions are influenced by several factors, for which the literature review provides an input. As described earlier, factors in this research refer to the aspects that influence the product's properties, or the aspects that directly influence a consumer's quality perception. The technological and managerial functions are influenced by respectively technological factors and managerial factors that in turn influence the product properties. The technological factors are the factors that are found to influence food waste at the stages of the route that food follows, which has been described in the under section 2.2.1 Drivers of food waste. The managerial factors cannot be directly related to the stages that food undergoes at the household, however, they are expected to influence the consumer's spoilage prevention. The managerial factors have been described more in detail under section 2.3 Factors influencing food waste.

Finally, the consumer's quality perception in itself is influenced by based several factors. These are described as quality perception factors, and influencing the consumer's decision of consumption or disposal. Therefore, these quality perception factors concern the immediate reasons for food waste. The relevant literature on these factors is described in section 2.2.2 Immediate reasons for food waste. The knowledge on how long a product's package is open, is described as an immediate reason to discard a food, and should therefore be considered as a quality perception factor. However, the opening of a package can also technologically influence the product's properties. Hence, besides that the time that a product's package is open is considered as a quality perception factor, it is also considered as a technological factor related to storage.

The quality perception factors, especially the sensory perception, are based on cues, i.e. the informational signals that consumers use in the formation of a quality perception (Steenkamp, 1990). By definition, the consumer's quality perception is subjectively formed. The properties of the product depend on the influencing factors in the preceding stages in the route that food follows. Although the influencing factors objectively change the product's properties, the focus of this research is on the formation of a quality perception, which concerns the product's subjective

properties. Since the consumer is present during all the household level stages, these stages are expected to influence the quality perception not only technically through the product's properties but also subjectively. The consumer is expected to have certain ideas on appropriate storage of a product, hence, the quality of a product can be perceived higher once the consumer knows that the product is stored under his idea of appropriate conditions. This is based on product specific cues too. Therefore, the theoretical framework also depicts the influence of cues relate to the technological factors. The managerial factors are not influenced by cues because they relate to the consumer rather than to the product.

The theoretical framework provides insights in the formation of consumers' quality perception in relation to food waste. However, literature does not provide particular insights on the formation of a quality perception of cheese and yoghurt. Empirical methods are required for gaining insight in the relevant cues that form a consumers' quality perception of cheese and yoghurt.

3. Cues in quality perception of cheese and yoghurt

This chapter starts with a description of the method that was used for identification of cues that consumers use in the formation of their quality perception of cheese and yoghurt. Secondly, the results of the identification of these cues are provided. After that follows a section in which the results are discussed.

3.1 Method

In order to find out which cues consumers use in the formation of a quality perception, semi structured interviews were conducted. The aim of the interviews was to provide an exhaustive list of cues that consumers use in the formation of a quality perception of cheese and yoghurt. Interviews are applicable for identifying cues, because it concerns the informational signals that consumers use in the formation of a quality perception (Steenkamp, 1990).

3.1.1 Interviewees

The interviewees were selected from a database, which was provided by Wageningen University and Research. The database contains contact information of potential interviewees that live in and around Wageningen, who have declared to be willing to participate in research. Moreover, the database provides information on the age and family compositions of the potential interviewees. This allowed for the selection of single person households, as these generate the most waste per person (Jörisen et al., 2015; Koivupuro et al., 2012). Age correlates negatively with the amount of food waste that consumers generate, which implies that young people tend to waste more food (Stancu et al., 2016; WRAP, 2008). However, it is unclear which age groups should be considered as young. Furthermore, the results from WRAP (2008) seem to indicate rather small differences in amount of food wasted between age groups. Since any information about the significance of the differences is lacking, only the age group that wastes the least was not incorporated as interviewees in this research, i.e. people of 65 years and older. Income was not taken into account in the selection of interviewees, as it is not shown to be convincingly correlating with the generation of food waste (Koivupuro et al., 2012; Williams et al., 2012).

The single person households, between the ages of 18 to 64 were selected from the database and contacted via email. The email contained a link to a short survey, which the persons that were willing to cooperate were requested to fill in. The questions in survey covered some demographic information like age and level of education, and questions concerning the person's consumption of cheese and yoghurt. For the purpose of the interview it was important that the interviewees consume cheese and yoghurt on a regular basis, thus only interviewees that consume cheese and yoghurt more than five times a month were selected. The interview was conducted among ten interviewees.

3.1.2 Interview procedure

The interview contained questions that were open-ended, in order to avoid that the interviewees were biased. The interview guide can be found in Appendix II. The interview guide was made in English and Dutch, as this allowed the majority of the interviewees to answer in their mother tongue language.

First of all, the interviewees were introduced to the research and in particular to the interview. Information about the purpose and length of the interview was provided, and the interviewees were asked to give permission for recording. In addition to recording the interview, the interviewer also took notes.

The distinction was made between questions concerning cheese and yoghurt. The order of these topics was randomly determined beforehand, as the answers on the first topic may influence the answers on the second topic. The interview started off with a general question concerning the interviewee's consumption of cheese or yoghurt. Although this question was also asked in the survey, it was repeated during the interview in order to get the interviewee involved in the interview. Then there was asked what the package size is what the interviewee usually buys.

This was asked because the package size is expected to influence the rate of food deterioration, since a small package is expected to be finished quicker.

After this, the interviewees were asked several questions that relate to food handling behaviour steps at the household level, e.g. shopping, after purchase and consumption. The interviewees were asked to image themselves during those steps, and to explain how they handle the products at those steps. After that the most important question for identifying the cues in the formation of consumers' quality perception was asked: When do you decide not to consume cheese/yoghurt anymore? The question was not framed in terms of disposal, but in terms of refusal to consume. The reason for this choice is that consumers may have a tendency to postpone the actual disposal of foods, until it has clearly reached the state in which it is deemed unacceptable. Evans, (2012) argues that consumers postpone the disposal because it reduces their feelings of guilt towards wasting food. Moreover, a question framed in terms of disposal might be negatively loaded, which can bias the interviewee's answers. Then, a package of cheese/yoghurt was handed over to the interviewee, followed by the question whether the interviewee would consume it. The characteristics of package were the following; the product's expiration date was the same date as the day of the interview and the package was unopened. A past expiration date is the most important reason for food disposal, both for cheese and other dairy products (WRAP, 2008). In order to identify other cues, there was chosen for a product of which its expiration date conformed to the day of the interview, in order to avoid that the date was the determining factor in answering the question. Although yoghurt remains safe until a month after the expiration date has passed (Cammelbeeck, 2013), the expiration date of the product shown during the interview was still chosen to conform to the day of the interview. The reason for this choice is that consumers may lack knowledge on the spoilage of yoghurt, which gets supported by a finding that the main reason for the avoidable disposal of yoghurt and cream is a past expiration date (63.1%) (WRAP, 2008). In case the interviewee indicated that he would consume the cheese/yoghurt, he was also asked whether they would consume the cheese/yoghurt if the product's expiration date would have passed and if the package would have been open. Finally, a question related to the last two sub questions was asked, which concerns the possible adaptation of the product's internal and external quality cues.

In case of a lack of clarity in the interviewee's answers, the answers were repeated by the interviewer, which invited the interviewee to correct any misunderstandings. The validity of the interview guide was tested in two pilot interviews.

3.1.3 Method of analysis

The aim of the interviews was to provide an exhaustive list of cues that consumers use in the formation of a quality perception of cheese and yoghurt.

There was not distinguished between the cues that play a role in the consume/not consume decision, and in the dispose/not dispose decision, because in both cases a quality perception that determines cultural edibility is formed. The difference is that some consumers may have a tendency to postpone the actual disposal (Evans, 2012).

The recorded interviews and the interviewer's notes were used in order to analyse the interviewees' answers, and identify cues that play a role. The interviews were not transcribed; instead, the mentioned cues were listed in the original form that the interviewees used. Cues that were mentioned more than once were only included once in the list, as the purpose of the interview was not to investigate the relative importance of the cues.

The list of cues was organised using coding, by which comparable cues were grouped into categories.

3.2 Results

This section covers the results of the interviews. First of all, the interviewees' demographics and their cheese and yoghurt consumption are discussed. After that, the findings are discussed; the identified cues that consumers use in the formation of a quality perception. The interviews also revealed factors, i.e. aspects that influence the product's properties. Naturally, these factors only

concern factors that the interviewees are aware of. The identified cues and factors are described, both for cheese and for yoghurt, regardless of their relevance to food waste. This is described according to chronologic stages in which consumers have contact with the product, without distinguishing between factors and cues.

3.2.1 Demographics of the interviewees

The interviewees were ten Dutch consumers, within the age range of 33 to 66 with a mean age of 57.1. The majority of the interviewees were female (seven out of ten). The level of education of the interviewees was relatively high; seven out of ten were graduates from either university of applied sciences or university. The household sizes of the interviewees varied between single household and three person households; six out of ten lived in a two person households.

3.2.2 Consumption of cheese and yoghurt

Eight out of ten indicated that they consume Dutch Gouda cheese every day. The remaining two interviewees claimed that they consume cheese at least a couple times a week. The ripeness of cheese that the interviewees normally consumed was variable, although most interviewees had a tendency to prefer mature to old cheese. Moreover, the majority indicated that they rather buy a piece of cheese than pre-cut slices.

Half of the interviews indicated that they consume yoghurt almost every day. Four interviewees claimed to consume yoghurt at least once a week. One interviewee indicated that she did not often consume yoghurt.

3.2.3 Cues cheese

The interviews revealed several cues that consumers use in order to form their quality perception of cheese. These cues are structured according to the stages that were discussed in the interviews; in store, transportation, storage, preparation and quality perception.

In store

The interviews also revealed the cues that consumers pay attention to in store when they are buying cheese.

Amount

Many interviewees indicated that when they buy cheese, they pay attention to the amount, or more specifically, to the weight. When the interviewees were asked why they take the amount of cheese into account, they often referred to the number of people in their household, and the expected time that it would take them to finish it. One interviewee explicitly mentioned that he notices that cheese gets drier after a couple of days, thus he does not want to buy too much cheese at once. On the other hand, another reason for paying attention to the amount of cheese that was mentioned by a couple of interviewees was that they do not want to run out of cheese before they were planning to buy cheese again.

Duration of aging

All of the interviewees mentioned that they paid attention to the duration of ageing of cheese. The majority of the interviewees had a preference for a more mature cheese, because they indicated that they appreciated the taste of older cheese. One interviewee indicated that a disadvantage of old cheese was that she had difficulties to cut the cheese. Some interviewees indicated that they had the impression that a more mature cheese can be preserved longer, compared to younger cheeses. Their reasons for this belief were that they had the idea that older cheeses have less moist and more salt than younger cheeses. However, the interviewees indicated that they do not take this into account when they buy cheese.

Price

Another aspect that all the interviewees mentioned as a point of consideration in the store was the cheese's price. The majority of the interviewees explained that they considered the price in

their decision because of financial reasons. One interviewee indicated that she always buys the cheapest package of her preferred cheese, despite the fact that it might contain less slices of cheese. Two interviewees indicated that they had a good impression of what cheese in general costs, and how this relates to the duration of ageing of cheese. They mentioned that they use this in deciding which cheese to buy. The interviewees had a different opinion on whether the price relates to the quality of cheese. Some interviewees mentioned that price does not give them an indication of the cheese's quality

Fat content

Several interviewees mentioned that they took the fat content of cheese into account when buying cheese. Some interviewees had a preference for cheese with a low fat content (30+), because they had the impression that this was good for their health. One interviewee had to admit that she did not really know whether the impact on her health would be different compared to fatter cheeses. However, others indicated that they buy cheese with a regular fat content (48+), because they had the impression that those cheeses have a fuller and creamier taste.

Shape

The majority of the interviewees that bought a piece of cheese indicated that they paid attention to the shape of a piece of cheese. The main reason that was mentioned for this was that it was considered as easier for slicing cheese when its shape was flat. Another reason was that the piece of cheese had to fit in a tupperware box that the interviewees' use for storing cheese.

Special offers

Many interviewees mentioned that they pay attention to the special offers in stores when they buy cheese. The reason for the interviewees to pay attention to special offers is mainly financially. Several interviewees mentioned that they consider cheese as an expensive product, and that it makes considerable difference to buy cheese on discount. One interviewee explicitly mentioned that he does pay attention to special offers, but that it is not guiding his decision. He only buys cheese of which he thinks it has a good quality. Another interviewee indicated that she buys more packages of cheese when there is a special offer on her favourite cheese. She claimed that she had experienced that she can preserve cheese for quite long.

Discount sticker

One interviewee indicated that she pays attention to a specific discount sticker that is provided to a product once it expires within a couple of days. She indicated that in general she does take a good look at a piece cheese with a discount sticker, in order to determine whether she want to buy the cheese. She experienced that almost always the cheeses with a discount sticker are still edible for at least a couple of days.

Expiration date

The majority of the interviewees said that they have a look at the cheese's expiration date when they buy cheese. The most mentioned reasons for this were that the interviewees have the impression that they can store the cheese for a longer period and that they are not planning to use the cheese immediately after purchase. Another reason for some interviewees was that they do not like to offer cheese with an expired date to their family members or guests.

However, one interviewee indicated that she does not consider the expiration date as determining her decision, because she has the impression that cheese can be preserved for a long period of time. Another interviewee said that the expiration date does not immediately influence whether she buys the cheese or not, but is more relevant for how long she leaves it in the fridge.

A couple of interviewees mentioned that they especially look at the expiration date of cheese when they buy it in the supermarket. The reason that they told for doing this, was that they have the impression that cheese in the supermarket could have been laying there for a long time, and

they want to prevent that they buy an old piece of cheese. One interviewee told that he pays attention to the expiration date because he sometimes experienced that his cheese shows already moulds at the moment that he takes it from the supermarket.

Moulds

Several interviewees indicated that they pay attention to whether the cheese does not show moulds, and that they do not buy a cheese that shows moulds on its surface. The reason that most of the interviewees mentioned for this decision, was that they felt that they did not get value for their money if they buy a cheese that already shows moulds at the moment of purchase. One interviewee mentioned that some cheeses can show some white spots on their surface. She does not consider these spots as moulds, but as a result of the salt in cheese. She indicated that it does not bother herself, but that she does not offer it to other people.

Not dried out

Another aspect of the cheese that the interviewees claimed to pay attention to in the store was their impression of whether the cheese is not dried out. The reason that was mostly mentioned for paying attention to this is that drier cheese is less tasty and less fresh. One interviewee indicated that it was important for her that the cheese was fresh, because that allowed her to store the cheese for longer without having to consume it immediately. The interviewees mentioned several visual aspects of the cheese that they use for concluding that a cheese is not too dry. First of all, most interviewees look at the outer side of the cheese, i.e. the rinds. If the rinds of cheese look dried out, it gives some of the interviewees the impression that the cheese does not taste as good, and that it is not fresh. Secondly, some interviewees also indicated that they pay attention to whether cheese shows bursts in its surface. The reason that was mentioned for paying attention to this was because they had the impression that bursts are an indication of a loss of moisture, which was believed to affect the cheese's taste. A couple of interviewees indicated that it gives an indication of whether the cheese was fresh; bursts on cheese were associated with less fresh cheese. Thirdly, some interviewees mentioned the colour of cheese as an indication of whether the cheese is not dried out. According to some of the interviewees, a darker colour indicates that the cheese is drier.

Rind

Some interviewees indicated that they take the size of the cheese's rind into account when buying cheese. By this they did not mean its crust, but the darker coloured part on the outer side of the cheese close to the crust. Some interviewees had the impression that this part of the cheese was harder and less tasty than the inner side of the cheese.

Some interviewees claimed that the size of rind gives them an indication of the duration of ageing of the cheese; an older cheese was believed to have a larger rind than a younger cheese.

One interviewee said that he took the size of the rind into account, because he does not eat that part of the cheese. He mentioned that therefore, it felt like a waste of money if you buy something for its full price of which a large part gets thrown away.

However, one interviewee claimed that the rind's colour gives an indication of whether the cheese had been kept at low temperatures. She had the impression that a cheese in general gets a darker colour when it is not kept cold, and therefore she also believed that the colour of the rind is be darker in case the cheese had not been stored cold for a longer period.

Closable package

Several interviewees mentioned that they took into account whether the cheese is packed in a closable package. The reasons that were mentioned for this were that a closable package prevents the cheese from developing moulds and drying, which was considered as distasteful. However, other interviewees indicated that they preferred to store cheese in another way, e.g. in a tupperware box. Many interviewees indicated that they used a specific paper in which freshly cut cheese is packed, because they could easily repack their piece of cheese during the time in which the cheese was at their homes.

Freshly cut vs. pre-packed

The interviewees differed in their preference for freshly cut or pre-packed cheese, although the majority indicated that they preferred cheese that was freshly cut. The reason for this preference that was mentioned the most, was that interviewees believe that freshly cut cheese has a better taste. Several interviewees indicated that pre-packed cheese tastes soggy than freshly cut cheese, or that it tastes more like plastic. One interviewee indicated that she had the feeling that vacuum-packed cheese has a more fatty structure on its surface. Several interviewees mentioned that they believed that cheese should be allowed some respiration, and thus preferred a freshly cut piece of cheese that is wrapped in paper. Some interviewees also had the idea that freshly cut cheese keeps its quality for longer than pre-packed cheese. They admitted that pre-packed cheese can be preserved longer, but once its package is opened it might develop moulds quicker than freshly cut cheese. Another reason that was mentioned by one interviewee for preferring freshly cut cheese over pre-packed cheese, was that he claimed to reduce his impact on the environment by buying a cheese that is not packed in plastic. He also mentioned that it gives him a nostalgic feeling to buy freshly cut cheese, because it reminded him of how it used to be to buy cheese.

However, there were also interviewees who preferred pre-packed cheese over freshly cut cheese. The most important reason that was mentioned for this was that interviewees had the impression that they can preserve pre-packed cheese for longer than that they can preserve freshly cut cheese. They had the impression that the influence of air and oxygen had negative effect on the preservability of cheese, and that this effect was limited for pre-packed cheese. Some interviewees also indicated that a pre-packed cheese gives them the feeling it has been handled hygienically, and that it comes with a smaller chance that anyone has touched the cheese. They indicated that this gives them a more comfortable feeling, although one of the interviewees reflected on himself by adding that this was based on nothing factual. Another interviewee emphasized that if nobody touches the cheese, could prevent the growth of moulds. One interviewee indicated that he preferred freshly cut cheese, but that it takes much effort and time in the store to ask someone to cut a piece of cheese. For this reason, he buys more often pre-packed cheese.

Swollen package

One interviewee mentioned that if a package of pre-packed cheese is swollen, he does not buy the cheese. He said that he knew from his work that a swollen package is an indication of yeasting, and that that gives a high probability of a deviating taste. Therefore, he pays attention in the supermarket to whether a package of pre-packed cheese is swollen.

Moisture

The same interviewee also indicated that he pays attention to whether the package shows moisture on its inside. Although he had the impression that this does not have to mean anything concerning the safety of cheese, he mentioned that he experienced that moist on the inside of a package causes cheese to become soggy. He regarded it as distasteful when the cheese is soggy. Moreover, he felt that it might indicate that the cheese has been stored at an inappropriate temperature, which, according to the interviewee, could cause a fading taste or an off-taste.

Trust and experience

Some interviewees mentioned that their choice for a certain store was their feeling of trust. They had previous experiences with that store, and therefore relied on that the quality of the cheese is good.

Transportation

One interviewee indicated that he took his means of transportation into account when he buys cheese. He mentioned that if he has to cycle for a longer time between the store and his house, he usually does not take a piece of cheese, but rather slices, because of its weight. Nevertheless, he

indicated that sliced cheese was more susceptible to get damaged in his backpack; hence a piece of cheese is better transportable in a backpack. Moreover, he indicated that he takes the temperature outside into account when he buys cheese. In case it is warm outside, and he has to cycle for half an hour to get home, he rather not buys cheese. The reason that he mentioned for this was that he is afraid that the cheese declines in quality, and that he does not trust its safety. He claimed that he still eats the cheese, but that he tries to finish it within a week.

Storage

All of the interviews indicated that they store their cheese in the refrigerator, although some seemed to doubt about whether this was the right place for storing cheese. They had the idea that cheese can also be stored outside the fridge, but somewhere slightly colder than room temperature. However, others indicated that cheese spoils faster when it is stored outside the refrigerator.

Location in fridge

Some interviewees mentioned that they have a fixed spot in the fridge that is reserved for storing their cheese. A reason for this that was mentioned was that it was considered as easy and convenient to have a fixed location for their cheese. However, some interviewees also had the impression that certain spots in the refrigerator are more suitable for storing cheese, due to its temperature.

Remove original package

A couple of interviewees mentioned that they immediately remove the original package from the cheese once they get home after visiting the store. One interviewee mentioned that she does this because she has the feeling that cheese has to breathe, and that this was restricted by the original package. Furthermore, she indicated that cheese starts to look less attractive when it is kept in an airtight plastic package. Another interviewee indicated that she removes the original package because she prefers to wrap the cheese in paper in a way that prevents direct contact with the cheese at the moment of slicing. She had the impression that this prevents moulds development, and if she does not do this immediately after purchase her husband carelessly opens the package and touches the cheese with his hands. One interviewee also indicated that after removing the package, she also immediately removes the cheeses crust completely. She claimed that her family would slice the cheese straighter if she did this, and thus the whole cheese would be used.

Leave in original package

However, others indicated that they leave the cheese in the package in which it was bought. Some had the impression that they could preserve cheese for longer if they left it in its original package until they consume the cheese.

Some interviewees mentioned that they use the original package for storing their cheese until it was finished, whereas others claimed to use something else for storing their cheese after they open the original package. One interviewee indicated that it was just laziness to leave the cheese in its original package until he consumes it, and that he uses an alternative for the original package after the first time that he consumed the cheese.

Alternative for original package

Most of the interviewees that indicated that they stored their cheese in something else than the original package mentioned that they had a box in their fridge in which they stored their cheese. The reasons that were mentioned for storing cheese in a box are to prevent it from drying out, and to keep it longer fresh. Other reasons were that interviewees experienced it as convenient; the box for cheese has its permanent location in the fridge and the cheese slicer can be put in the box as well. One interviewee mentioned explicitly that she leaves the box slightly open, because she experienced a development of condense within the box. She wanted to prevent this because, in her opinion, the cheese gets soft and wet, and thus less tasty. Besides using a box to store her

cheese, she also uses a specific cheese paper, mainly because in that way she does not have to clean the box so often.

Two interviewees indicated that they sometimes used a plastic bag for storing cheese; one of them indicated that he did this once he was not able to properly close the original package. The other interviewee mentioned that he stores cheese in a plastic freezer bag, if the piece of cheese does not fit into the box in which he usually stores cheese. Both the interviewees had the impression that storing cheese in plastic restricts the contact with air, and thus the cheese can be preserved for longer.

Preparation

The majority of the interviewees claimed to appreciate the taste of cheese more, when cheese is at room temperature. In order to allow cheese to reach room temperature before consumption, most of the interviewees take the amount of cheese that they need out of the refrigerator some time before consumption. However, one interviewee indicated that he takes his complete cheese out of the refrigerator one or two hours before consumption. He has the impression that this was not influencing the preservability of the cheese, because he considers it a short period of a higher temperature. Some interviewees indicated that they eat cheese on a sandwich for lunch, and that they often prepare their sandwiches a couple of hours in advance. Most of them do not store these sandwiches in the refrigerator after preparation, because it is sometimes not possible, but also because they claimed that it is beneficial for the cheese's taste to eat it on room temperature. However, one of the interviewees indicated that he stores his prepared sandwiches in the refrigerator, because he appreciates bread to be cold.

Quality perception

The question that was aimed at identifying the cues for not consuming cheese anymore was; when do you not consume your cheese anymore? Besides the follow-up questions that aimed at identifying the reasons for not consuming cheese anymore, there was also another follow up question phrased in terms of how they would judge the quality of cheese.

Moulds

The foremost mentioned reason why the interviewees do not consume cheese anymore, was when it shows moulds on its surface. The reasons that interviewees indicated were varying. Some interviewees mentioned that they are afraid that it is not safe and healthy to consume cheese with moulds, and that they are afraid to get ill after its consumption. One interviewee mentioned that the combination of proteins and moulds is harmful to people's health, and thus she does not consume cheese with moulds. However, others stated that they do not appreciate the taste of moulds, and that it is unattractive to them.

Nevertheless, the majority of the interviewees indicated that if they find moulds on the surface of their cheese, they sometimes remove the part with moulds and still consume the rest of the cheese. The interviewees mentioned that this depends on some factors. Some respondents indicated that the size of the parts with moulds and the size of the piece of cheese determine whether they remove the moulds. Another interviewee mentioned that she removes moulds only if the cheese still smells good.

The interviewees mentioned different purposes for the remaining part of cheese, after removal of the moulds. Some interviewees mentioned that the cheese still tastes as good as before, and thus they consume it as they normally do. However, other interviewees do not eat their cheese on a sandwich anymore, because they believe that the taste is not as good anymore. Therefore, they only use it in a hot meal. Some of the interviewees have the impression that if the cheese is heated, that some harmful bacteria could be killed.

Dry

Several interviewees indicated that they do not consume cheese anymore in case it is dried out. The interviewees mentioned several signs that indicate that cheese is dry, such as small bursts in the cheese, salt crystals on a cheese that is not supposed to have salt crystals, or warped slices.

Also a darker colour is considered to indicate that the cheese is somewhat dried out. The most mentioned reason for not consuming dried out cheese anymore is the decline in taste. One interviewee indicated that in that case it is not tasty anymore to eat with bread or with a drink, it can still be consumed over a warm meal.

Colour

Some interviewees indicated that they look at the cheese's colour for an indication of its quality. As mentioned before, the colour is for some interviewees an indication of whether the cheese is dried out. Furthermore, some respondents indicated that the colour of the cheese provides them an indication of the duration of ageing of the cheese, implying that an older cheese has a darker colour.

Rind

Several interviewees indicated that they pay attention to the rind of cheese, because it gives them an indication of how old the cheese is in terms of freshness and age. One interviewee explicitly said that a large rind is a reason for him not to buy a cheese, however, it is not a reason for him not to eat a cheese. Another interviewee said that it gives her an impression of how long the cheese had been out of the fridge; a darker rind indicates that the cheese has been out of the fridge for a longer time. She did not have the impression that the safety of the cheese is influenced on the short run by leaving it out of the fridge, however, she indicated that on the long term it is better to store a cheese in the fridge. Another reason for paying attention to the rind was that she had the impression that the rind of the cheese is harder and thus less tasty.

Too hard

One interviewee claimed that she does not consume cheese anymore when it is too hard. She felt that it is unsafe to cut cheese that is hard, and grating hurts in her arms. Nevertheless, she said that the taste can still be good if cheese is too hard.

Expiration date

Most interviewees indicated that they do not pay attention to the expiration date in judging whether they would still consume the cheese, although one interviewee said that she would look at the cheese's expiration date if she would doubt about its safety. Many interviewees said that in general, they still eat cheese a long while after its expiration date has passed. Some interviewees said that they do not mind to eat cheese that has passed its expiration date themselves, however, they do not feel comfortable to serve it to others. Some mentioned that for cheese they would be less careful compared to other food products considering the expiration date, because of several reasons. One reason that was mentioned was that the sign of moulds gives them an indication of the safety, however, another reason was that they had the impression that other food products spoil faster than cheese.

Time that package is open

One interviewee indicated that he pays attention to the time that the cheese's package has been open. If the package is open for one or two weeks, he gets the feeling that he needs to finish the cheese. He mentioned that this has nothing to do with the cheese's appearance, but just his impression that the cheese had been laying there for a long time gives him the idea that it is time for a new piece. He claimed that he does not discard the old piece of cheese, but that he finishes it in a practical way, like using it in a warm meal.

Shape

Some interviewees indicated that the shape of a piece of cheese gives them an indication of its quality. According to one interviewee, a bulged shape implies that a piece of cheese has not been stored cool for a longer time. Another interviewee mentioned that a bulged shape indicates that the cheese is a little older, by which he does not mean the duration of ageing of the cheese, but that it is not freshly cut.

Feels soft

Two interviewees mentioned that they pay attention to whether a piece of cheese feels soft when judging its quality. However, both of them said that this was only applicable for young cheese, as it is a characteristic of younger cheese to feel soft. The reason for paying attention to this was to check whether the cheese meets their expectations, i.e. a young cheese that is not feeling too hard.

Smell

Several interviewees indicated that the smell of cheese gives them an indication of the quality of the cheese. One interviewee said that its smell indicates how old the cheese is in duration of ageing, however, it was also claimed to give an indication of the cheese's freshness. An older cheese that starts to show moulds smells differently; a musty smell. One interviewee mentioned that if a cheese smells musty and rotten, he immediately disposes the cheese. The reason that he mentioned for doing that was that he doubts the safety of the cheese if it smells like that.

Taste

Several interviewees mentioned that if the taste of cheese is bad, that they do not consume the cheese anymore. Interviewees mentioned that they discard cheese if it does not taste as cheese anymore, its taste has declined a lot or if it does not meet the expectations. One interviewee mentioned that the first slice of a piece of pre-packed cheese tastes like plastic, and therefore he discards the first slice.

3.2.4 Cues yoghurt

The interviews have revealed several cues that consumers use in order to form their quality perception of yoghurt. These cues are structured according to the stages that were discussed in the interviews: in store, transportation, storage and preparation. The interviews ended with how the respondents judge the quality of cheese and yoghurts, the cues that were identified for the consumer's quality perception of yoghurt are described at the end of this section.

In store

The interview question that concerned what consumers pay attention to when buying yoghurt, revealed a number of cues that are of importance to consumers.

Fat content

Many respondents indicated to pay attention to the yoghurt's fat content. The reasons that this was important in their choice decision were varying. One the one hand, people recognized the fat content as an indication for the taste of the yoghurt: "I think that low fat yoghurt is not tasty". On the other hand, the fat content was also important in their decision because people did not want to intake too many calories.

Organic

Secondly, some interviewees mentioned that they pay attention to whether yoghurt is organic. The reasons for the preference for organic yoghurt were that people had the impression that organic yoghurt is healthier, both for the individual and for the society as a whole. One interviewee indicated that choosing organic products suits with her view of life. Another reason for choosing organic yoghurts that was mentioned was that the organic yoghurt is tastier than the conventional yoghurt. The organic yoghurt was perceived as more sour, which was preferred by the interviewee, and thus the only reason for choosing organic yoghurt. Some interviewees did have the idea that organic products can have a tendency to spoil faster, but that did not play a large role in their decision process. However, one interviewee claimed that the idea that organic products spoil faster encouraged him to pay attention to the package size.

Type

Interviewees also mentioned that they paid attention to the type of yoghurt. Some preferred Greek yoghurt, while others had a preference for conventional Dutch yoghurt. The reason that interviewees indicated for paying attention to the type of yoghurt was its taste. Taste was also mentioned as an aspect on its own, thus not related to the type of yoghurt. Some interviewees indicated that they knew from experience how certain yoghurts taste.

Price

Another aspect that the interviewees indicated to pay attention to when buying yoghurt, was the price. Most interviewees claimed that the price was important for financial reasons. However, some also related a yoghurt's price to its quality. One interviewee claimed that the price was not the crucial aspect of yoghurt, because its taste was more important. Several interviewees indicated to recognize a relationship between price and sourness.

Special offers

Interviewees also mentioned that they would pay attention to special offers, also for financial reasons. One interviewee indicated that she would specifically pay attention to products that have been provided with a 35% discount sticker, which indicates that the product soon reaches the expiration date. She indicated that she would definitely buy those products for financial reasons. Moreover, she mentioned that she had not experienced a difference in quality compared to the products without a discount sticker, but nevertheless she would try to finish the product quickly.

Expiration date

Furthermore, the majority of the interviewees indicated that they pay attention to the product's expiration date when buying yoghurt. Reasons that were mentioned for incorporating the expiration date in the choice of a product were that people wanted to keep the product for a longer period, not having to use the product immediately. Some interviewees mentioned that they would pay attention to the expiration date because of their impression that yoghurt spoils fast. Others indicated that they preferred to buy yoghurt that will not expire within the period in which they think they can finish the product, despite their idea that yoghurt can still be safely consumed after the expiration date.

Package

A few interviewees pointed out that they would take the size of the package into account when buying yoghurt. The reason was that they wanted to be able to finish the yoghurt before it spoils. Another aspect that was mentioned by some interviewees was that they paid attention to whether the package was damaged. Several interviewees indicated that the reason for not wanting a damaged product was that they wanted the most beautiful product for their money. One interviewee specifically pointed out that he pays attention to whether a package of yoghurt is provided with a plastic twistable cap. He indicated that a cap allows him to close the package better, preventing the product to be exposed to air. He had the idea that a cap would prevent the yoghurt from leaking in the fridge, and that he therefore could preserve the yoghurt longer. The interviewee indicated that the yoghurts in packages without caps takes over the taste of cardboard, and develops moulds more quickly.

Temperature package

Finally, another aspect that was indicated by one interviewee was whether the package of yoghurt feels cold. In case the package feels lukewarm, the interviewee would conclude that the yoghurt has not been refrigerated for a longer time. Then, he would not trust the safety of the yoghurt anymore, and therefore he would not buy it. He indicated that he had the impression that there might be a larger chance of spoilage when the yoghurt would have been left out of the refrigerator for too long.

Transportation

One interviewee indicated that he took the outside temperature and his means of transportation between the store and his home into account when he buys yoghurt. He claimed that he sometimes did his groceries in a store that is a half-hour bike ride away from his home. He mentioned that he is less likely to buy yoghurt during summer when he does his groceries in that specific store. The reason for this is that he has the impression that if yoghurt gets warm in his backpack, there might be a bigger chance that the yoghurt gets spoiled, and that it is unsafe to consume.

Storage

All interviewees indicated that once they returned home after purchasing the yoghurt, they would store the yoghurt in their refrigerator. The reason for storing yoghurt in the fridge was that they had the idea that the yoghurt would spoil faster if they would not store it in the refrigerator. Several interviewees indicated that they did not appreciate the taste of warm yoghurt. Another interviewee indicated that she thought that the yoghurt might get sour, which is unfavourable because of its taste and she would be concerned about its safety.

Preparation

A third topic that was addressed during the interviews was how the interviewees would describe the moment directly before the consumption of yoghurt. Some interviewees indicated that they shake the package of yoghurt before pouring it into a bowl, as this would homogenize the yoghurt and prevent that a liquid substance would come out of the package.

The majority of interviewees mentioned that they do not immediately consume their yoghurt once they got it out of the fridge, because they do not favour the cold temperature. The reason for not appreciating cold yoghurt, is that it was considered as less tasteful at a lower temperature. Therefore, some interviewees leave their bowl of yoghurt untouched for around 30 minutes in order to allow it to get to a room temperature. However, others put their bowl of yoghurt in the microwave for 10 to 15 seconds.

The majority of interviewees indicated that after pouring yoghurt into a bowl, they immediately put the remaining yoghurt back into the refrigerator. Most interviewees indicated that the reason for doing this was that it is part of their routine of getting some yoghurt. One interviewee indicated that she usually takes her package of yoghurt out of the fridge, place it on the table, and leave it there until she finished eating.

Quality perception

Also for yoghurt, the cues for the interviewees' quality perception are identified. The cues are discussed in an admissible order of perception, i.e. firstly, a visual impression of the package, visual impression of the yoghurt, olfactory impression of the yoghurt and finally the gustatory impression of the yoghurt.

Clean package

First of all, the cues that are mainly based on visual impression of the package are discussed. A number of interviewees indicated that they would pay attention to whether the package seems clean. The interviewees had to admit that a clean package does not have to imply anything about the yoghurt, however, it did give an indication that the yoghurt had been stored in a clean space. One interviewee reflected on herself by saying that there can be really bad yoghurt in a clean package, but that it gave her some trust if the package would be clean. Another interviewee indicated that if the outside of the package of yoghurt is dirty, he would not consume the yoghurt anymore. He mentioned that something in the fridge might have leaked, which makes him doubt about the safety of the yoghurt. Consequently, he throws the yoghurt away.

Swelling of package

Another aspect of the package that several interviewees paid attention to when deciding whether they would still consume yoghurt, was the swelling of the package. One interviewee

mentioned that a reason for paying attention to this was that it would give an indication of whether the yoghurt would be near to its expiration date. Some interviewees said that a swollen package can indicate that there is some gas formation or yeast inside the package, from which they draw the conclusion that the yoghurt is too old for consuming safely. One interviewee added that he does not trust the yoghurt anymore if its package would be swollen, because it deviates from the normal situation. Several interviewees mentioned that they throw yoghurt away if its package is swollen. One interviewee indicated that he still smells the yoghurt, but does not taste it because he is afraid that there is a chance of getting ill or feel bad after tasting the yoghurt. However, another interviewee said that a bit swollen package is normal for yoghurt, especially at the bottom of the package. She had the idea that the heavy elements in yoghurt drop over time, resulting in some swelling at the bottom of the package, which does not necessarily indicate yeasting and rotting. Consequently, she shakes the package a little harder, in order to homogenize the yoghurt again.

Leakage of the cap

One interviewee indicated that if the cap has leaked, he would be more careful. Once the leaked yoghurt has dried, he concludes that it has leaked already for a few days. Hence, he concludes that some organisms might have entered the package. He indicated that he is afraid of transfer from other products in the fridge, and thus he disposes the yoghurt. If the leaked yoghurt has not dried, he still consumes the yoghurt. Nevertheless, he cleans the cap with water.

Expiration date

Several interviewees indicated that they did not look at the expiration date when deciding if they would still consume yoghurt. The majority of interviewees mentioned that they would check themselves by looking, smelling and tasting whether they would still consume the yoghurt. Some interviewees indicated that they would become more careful if the expiration date would have passed two days ago, whereas others mentioned that they would still consume yoghurt after a week of the expired day. One interviewee had the idea there might be some quality loss after the expiration date, but that you would not get ill when consuming it. Follow-up questions revealed that quality loss implied a loss in taste.

Liquid layer on top of yoghurt

Besides the visual impression of the package of the yoghurt, interviewees also paid attention to the looks of the yoghurt itself. Several interviewees mentioned that they pay attention to whether the yoghurt would have separated, and thus formed a liquid layer on top of the yoghurt. Some interviewees indicated that if they do not shake the package and the liquid comes out of the package instead of the yoghurt, they would not consume the yoghurt anymore. Their reason for not consuming this anymore was that it was considered as not tasty. However, other interviewees indicated that they would not find this a reason to for not consuming the yoghurt, and they would shake the package before pouring it into a bowl.

Moulds

All interviewees indicated that they dispose yoghurt if it shows moulds. The reason that was mentioned for doing this was the idea that the intake of moulds is not healthy and not tasty. However, some interviewees admitted that they did not know whether the intake of moulds is harmful to their health. Nevertheless, all interviewees considered moulds on yoghurt as unattractive and unappetizing, and therefore do not consume it anymore.

Colour

Some interviewees also mentioned that they would pay attention to the yoghurt's colour. If the colour would be different than from what they expect, it could be a reason to be more careful. However, one interviewee mentioned that the colour does not reveal anything about the edibility of yoghurt, as yoghurts can vary in their colour. She also said that she was visually impaired, and thus did not pay attention to the yoghurt's colour in her decision for consumption.

Lumps

Another aspect of the yoghurt that interviewees indicated to be an indication of the yoghurt's quality was the presence of lumps. Several interviewees mentioned that they considered the presence of lumps in yoghurt as unappetizing, and different than they expect yoghurt to be. However, one interviewee indicated that the yoghurt she consumed is never completely uniform, and that she considered that as tasty.

Smell

Furthermore, the interviewees also base their judgement of the quality of yoghurt on its smell. Interviewees indicated that they do not consume yoghurt anymore if it does not smell tasty anymore, or if the smell deviates from how yoghurt normally smells. Some interviewees reasoned that it does not taste good if it releases an unpleasant or deviating smell, whereas others are afraid of the presence of harmful bacteria, which causes them to become ill. One interviewee indicated that yoghurt does not smell differently, because it is too cold to release a smell, and that she therefore trusts more on her taste experience. On the contrary, another interviewee mentioned that she trusts her nose in judging whether something is safely edible or not, and therefore does not taste the yoghurt if it releases a deviating smell.

Taste

Finally, a yoghurt's taste is also considered in the judgement of the edibility of yoghurt. Several interviewees indicated that if they doubt about the yoghurt's safety, that they carefully taste a little bit. The interviewees consider it a bad sign of the yoghurts safety in case it tastes differently than how it should taste. Many interviewees indicated that if they experience the yoghurt as too sour, that they would be afraid that it is harmful to their health.

Additional results

Several interviewees indicated that they had the impression that yoghurt does not spoil fast, and that it can be preserved for a relatively long time.

3.3 Discussion of the results

The interviews revealed a number of cues and factors that interviewees pay attention to during shopping, after the purchase, and before and during consumption. However, not all of these cues and factors are relevant for the consumers' quality perception in relation to food waste. Therefore, in the following paragraph all identified cues and factors are discussed on whether they relate to the disposal of cheese and yoghurt. The cues and factors that are considered as relevant to food waste are incorporated into the survey as independent variables that influence people's decision to either consume or dispose cheese and yoghurt, or as additional variables that help explain certain relations. The section ends with an overview of the results, presented in Table 1, in which there is made a distinction between factors and cues.

3.3.2 Discussion results cheese

First of all, the cues that consumers pay attention to when they buy cheese are discussed on their relevance to food waste. The amount or the weight of cheese is considered as relevant to food waste, because some interviewees indicated that they take this into account in their buying decision because they do not want to run out of cheese before they plan to go shopping again. This might imply that people are tempted to buy more cheese than they actually need, and therefore this is considered as relevant to food waste. The length of aging of cheese is not considered as relevant to food waste, because the interviewees indicated that they took this into account purely because of their taste preference. Nevertheless, some interviewees had the impression that a younger cheese is more susceptible to spoilage than a mature cheese, and therefore, the length of aging is incorporated as an additional variable in the survey. The price of cheese is not considered as relevant to food waste, because the majority of the respondents indicated that the price was taken into account during shopping because of financial reasons, and that it did not give them an indication of the cheese's quality. The fat content of cheese was

also an aspect that claimed to be considered when people buy cheese. The interviewees indicated that they took this into account because of their health and the influence on the taste of cheese. This suggests that the fat content is not an aspect that is relevant to food waste, however, the literature review indicates that the perceived healthiness of a product can influence people's disposal of food at their homes (Block et al., 2016). Therefore, the fat content of cheese is incorporated as an additional variable in the survey. Another aspect that the interviewees indicated to pay attention to when they buy cheese is the shape of cheese, because it is considered as easier to slice cheese when it has a flat shape. Since it appeared that for some interviewees a reason to discard cheese is that it is too hard to cut safely, the easiness to slice and consequently, the shape of cheese is considered as relevant to food waste. Furthermore, another reason to pay attention to the shape of cheese was that it determines how people store their cheese. This can influence the spoilage of cheese and therefore provides another reason to consider the shape of cheese as relevant to food waste. Another aspect that people pay attention to when they buy cheese is special offers. Although the foremost reason to pay attention to special offers appeared to be financially, some interviewees had the tendency to buy more cheese in case there would be a special offer. This is considered as relevant to food waste. Also a discount sticker for products that soon reach the expiration date is considered as relevant to food waste, because there can be assumed that a cheese that is provided with such a sticker can be less long preserved, hence increases the chance that the cheese is discarded. Another aspect is the expiration date, which is considered as relevant to food waste. On the one hand, the expiration is relevant to food waste because literature revealed that it determines people's quality perception (Evans, 2011), and on the other hand because some interviewees had the impression that the expiration date influences the time that they can store cheese. The sign of moulds was also an aspect that the interviewees claimed to pay attention to when they buy cheese. This is considered as relevant to household food waste, because all the interviewees indicated that moulds is their main reason to discard a part of cheese. Another aspect is whether a cheese looks dried out, which was paid attention to because the interviewees claimed that it gave them an indication of the cheese's taste and freshness. The fact that for some interviewees it provides an indication of the cheese's freshness, makes it relevant to food waste. The rind of cheese considered as relevant to food waste too, because a reason to pay attention to it were that this part of the cheese is less tasty and thus not consumed. Another reason to pay attention to the cheese's rind was the impression that a cheese's rind provides an indication of whether the cheese has been stored on cool temperatures. The interviewees also claimed to pay attention to the package of cheese. Several aspects were considered important; a closable package, or freshly-cut vs. pre-packed cheese. These aspects are considered relevant to food waste, because the reasons that the interviewees claimed to have for a certain preference were taste and preservability. However, there was no consensus among the interviewees' impression of influence of different types of packages on the quality of cheese. Therefore, the package of cheese is included in the survey as an additional variable. One interviewee also claimed to pay attention to whether a package of cheese would be swollen or show moist from the inside, because it gave him an indication that he should be careful considering the safety of the cheese. These aspects were not incorporated in the survey because they were only mentioned by one respondent, who claimed that he knew these indicators from his work experience. Another aspect that the interviewees mentioned to consider when buying cheese was their trust and experience with a certain brand or store. This allowed them to rely on the quality of cheese. Trust and experience is not considered as relevant to food waste, because the interviewees did not mention anything about its influence on the change of quality over time of a cheese.

Secondly, the aspects concerning the transportation of cheese are discussed on their relevance to food waste. The aspects that were mentioned were the means of transportation between the store and home, the time it takes to get from the store to home, and the temperature outside. The reason to pay attention to these aspects were that a cheese was expected to decline in quality, and consequently the safety of the cheese would be doubted if e.g. the temperature outside would be high. Therefore, these aspects are considered as relevant to food waste.

Thirdly, the aspects that were mentioned to be considered concerning the storage of cheese are discussed on their relevance to food waste. First of all, storing cheese in the fridge is considered as relevant to food waste, because the majority of interviewees had the impression that this can influence the spoilage rate of cheese. The location within the refrigerator to store cheese is also considered as relevant, because some interviewees mentioned that some locations in the fridge have a better temperature for storing cheese, regarding its quality and spoilage. Besides the location of storage, also the way in which cheese is stored was mentioned as an aspect regarding the storage of cheese. Some interviewees kept their cheese in its original package, whereas others indicated to remove the original package. The latter was either done immediately once they got home from shopping, or at the first moment of consumption. Some interviewees indicated that they removed the complete crust of the cheese immediately once they got home from shopping, whereas others did this at the first moment of consumption or not at all. Two interviewees also paid attention to how they touched the cheese. All of the just described behaviours were performed for several reasons; convenience or habit. However, a reason that was mentioned by most of the interviewees was the expected influence on the cheese's quality and spoilage rate. Therefore, these aspects are considered as relevant to food waste, and are incorporated into the survey as independent variables.

Furthermore, the aspects that the interviewees consider directly before the consumption of cheese are discussed on their relevance to food waste. Many interviewees claimed to consume cheese often at room temperature, because of a preference in taste. This is not considered as relevant to food waste, because most interviewees mentioned that they only take the cheese from the fridge that they are planning to consume.

Finally, the aspects that the interviewees consider when they decide to either consume or dispose cheese are discussed on their relevance to food waste. As for the case of yoghurt, all the discussed aspects are considered to be relevant to food waste, because it directly influences whether a consumer decides to still consume or dispose their cheese. However, the expiration date is not considered relevant for the decision to consume or dispose cheese, since most of the respondents indicated that they do not pay attention to the expiration date when they make that decision.

3.3.2 Discussion results yoghurt

As for cheese, the aspects that consumers pay attention to during the purchase of yoghurt are reflected on their relevance to food waste. The yoghurt's fat content is not considered as relevant for consumers' perception of quality in relation to food waste, because the interviewees mainly paid attention to it because of health and sensory reasons. However, since literature suggests that the perceived healthiness of a product can influence the generation of household food waste (Block et al. 2016), the fat content of yoghurt was incorporated in the survey as an additional variable. Some consumers appear to pay attention to whether a yoghurt is organic or not. Consumers might lightly associate organic products with a tendency to spoil faster. However, since the foremost reasons to buy organic yoghurt appeared to be process and sensory related, organic is not considered as relevant for food waste. The type of yoghurt is also not considered as relevant for food waste, because the only reason to pay attention to the type of yoghurt appeared to be its taste. However, since the tastiness of a product can also have an influence on food waste, the type of yoghurt is incorporated into the survey as an additional variable. Consumers appear to pay attention to the price of yoghurt because of financial and sensory reasons. Hence, price is not considered as relevant for the formation of a quality perception in relation to food waste. Special offers on yoghurt are mainly taken into account because of financial reasons, and therefore it seems irrelevant to the formation of a quality perception in relation to food waste. However, it can result in people taking advantage of special offers, which implies that they buy more cheese than that they normally would. Therefore, special offers are considered as relevant for food waste. Besides special offers, the specific discount sticker that is provided to products that soon reach the expiration date is also considered as relevant to food waste. This is considered as relevant because of the fact that a

yoghurt provided with such as a sticker is sooner reaching the expiration date, and might spoil faster than similar products without a sticker. Another aspect that is considered is the yoghurts' expiration date, mainly because of the impression that yoghurt spoils fast. Therefore, the yoghurt's expiration date is considered as relevant to food waste. Furthermore, several aspects of the package were considered. First of all, the size is considered relevant to food waste because the reasons that were mentioned to pay attention to relate to consumers' attempts to finish the yoghurt before it spoils. Secondly, potential damage to the package is considered as relevant, despite the finding that consumers pay attention to this because they want value for their money. A damaged package can influence the rate of spoilage of yoghurt, hence potential damage to the package is considered as relevant to food waste. Furthermore, the presence of a twistable cap is considered as food waste, because it was believed to influence the preservability of yoghurt. Finally, the temperature of the package is considered as relevant for food waste. The temperature appeared to be taken into account during the purchase of yoghurt because it is believed to influence the yoghurt's safety, which is relevant to food waste.

Secondly, the aspects that consumers consider during transportation of their yoghurt between the store and their house are discussed on their relevance to food waste. One interviewee appears to take the temperature outside and his means of transportation into account, because he believes that it influences the chance that the yoghurt gets spoiled. Therefore, these two aspects are considered as cues to the formation of a consumer's quality perception in relation to food waste. Figure 4 depicts these aspects as technological factors, based on the drivers of food waste (Terpstra et al., 2005). The temperature and means of transportation directly influence the products properties, allowing it to be considered as technological factors. Nevertheless, the consumer uses these aspects as cues too, because it can influence how they handle the product. Thirdly, the aspects that consumers pay attention to during storage of yoghurt are discussed. All interviewees appear to store their yoghurt in the refrigerator, mainly because they have the idea that this reduces the rate of spoilage. Hence, the storage is considered as relevant to food waste.

Furthermore, the aspects related to the yoghurt's consumption are discussed on their relevancy to food waste. Some interviewees claimed to shake the package of yoghurt before consumption, as it homogenizes the yoghurt. This is considered as relevant to the formation of a quality perception in relation to food waste, because for some interviewees the separation of yoghurt is an indication of a reduction in taste and might be a reason for disposal. Some interviewees appear to consume their immediately once they took it out of the fridge, whereas others preferred to either leave their bowl untouched for a while or use the microwave for allowing the yoghurt to reach room temperature. The reasons that the interviewees indicated for their behaviour were sensory preferences. Therefore, this is not considered as relevant to food waste. Finally, the aspects that consumers consider when they decide not to consume yoghurt anymore are discussed on their relevance to the formation of a quality perception of yoghurt in relation to food waste. These aspects all appear to be relevant, as these can directly influence whether a consumer decides to still consume or dispose their yoghurt.

3.3.3 Overview of all results

An overview of the results revealed by the interviews is depicted in Table 1. The table indicates the cues that consumers pay attention to during all the stages in which consumers have contact with the product. The final row includes additional variables that appeared relevant for the disposal of cheese and yoghurt. There is distinguished between factors and cues, based on the definition of factor that is used in this research; factors influence the product properties.

Table 1: Overview of the interview results; the relevant cues and factors for cheese and yoghurt disposal presented in the chronologic stages in which consumers have contact with the product.

	Cheese		Yoghurt	
	Factors	Cues	Factors	Cues
Shopping	Special offers	Amount or weight Discount sticker Shape of cheese Expiration date Moulds Dried out Rind	Special offers Potential damage of package Temperature package	Expiration date Amount or size of package Twistable cap Discount sticker
Transportation	Means of transportation between home and store Time it takes to get from the store to home Temperature outside		Means of transportation between home and store Time it takes to get from the store to home	
Storage	Fridge Location within fridge Original package Removing crust Touching cheese		Fridge	
Preparation			Shake package	
Quality perception		Moulds Dry Colour Rind Too hard Time that package is open Shape Feels soft Smell Taste Bursts		Clean package Swelling of package Leakage of the cap Expiration date Liquid layer on top of yoghurt Moulds Colour Lumps Smell Taste
Additional variables	Duration of ageing Fat content Package		Fat content Type of yoghurt	

4. Consume or dispose cheese and yoghurt

This chapter starts with a description of the method that was used for investigating how the relevant factors and cues influence the consumers' decision to consume or dispose cheese and yoghurt. Secondly, the results are provided. After that follows a section in which the results are discussed.

4.1 Method

In order to get an insight into how the identified factors and cues influence the consumers' decision to consume or dispose cheese and yoghurt, a survey was used. This method was used because of its advantage of a large sample size, which increases the reliability of the results. Furthermore, a survey has the characteristic that the questions can be answered anonymously, which increases the chance that people give honest answers. The respondents were not informed that the topic concerned food waste, because it can be considered as a sensitive topic.

4.1.1 Respondents

The data was collected by the use of a survey. The survey was distributed among the same database as through which the interviewees were contacted and by using a personal mailing list. Furthermore, the snowball sampling method was used, as some respondents distributed the survey among their own networks. The survey was only distributed among Dutch people, because they are expected to be familiar with the Dutch cheese and yoghurt. These people have been contacted by an email that contained a link to the survey. Eventually, the sample size was 185 respondents.

4.1.2 Survey

The survey was designed in order to answer the following sub question: *How do the identified factors and cues influence the consumers' decision to consume or dispose cheese and yoghurt?* The dependent and independent variables that this question contains, are respectively the decision to consume or dispose and the factors and cues. The following section describes how these variables were measured in the survey.

Dependent variables

The dependent variable in this question concerns people's decision to consume or dispose cheese or yoghurt. In the survey, this was measured by several variables, by which there was focussed on the disposal of each of the products. The disposal of cheese was measured by two questions. Firstly, a question on how often the respondents dispose (a part of) cheese, which excludes the disposal of the crust of the cheese (Q35). The answer categories of this question ran from daily to less than annually, which was represented in seven options. Secondly, a question on the amount of cheese that is disposed each time that they dispose cheese (Q36), which was answered on a seven point bipolar scale from little to a lot. The answer categories of this question were formulated in a qualitative way, instead of a quantitative way because quantitative answer categories have a high chance of errors (Jörissen et al., 2015). Similar questions were formulated to measure the disposal of yoghurt (Q37, Q38).

Independent variables

The independent variables were the identified factors and cues that are expected to influence the consumers' decision to consume or dispose cheese and yoghurt. The factors were found in literature and include the managerial factors, technological factors, as from now referred to as respectively M-factors and T-factors, and quality perception factors. The cues were identified by the interviews, and are therefore more specific for the disposal of cheese and yoghurt compared to the general food waste factors found in literature. The M-factors remained general food waste influencing factors, as these were not directly related to the product. However, the T-factors and quality perception factors have become more specific for the formation of the consumer's quality perception of cheese and yoghurt, because of the identified cues.

M-factors

The general M-factors included intention not to waste food, perceived behavioural control, perceived household skills, planning, estimation necessary amounts (Q42), preparation skills and stock management (Q42.4, Q42.5, Q43). In order to measure the respondents intention not to waste (Q39) and perceived behavioural control (Q40) developed scales by Stancu et al. (2016) were used. A scale of Stancu et al. (2016) was also used in order to measure perceived household skills (Q41), however, the scale in their research referred to just household skills. Despite that the scale was not intended to measure perceived household skills, it was considered applicable because of its measuring method. A survey does not allow measuring actual household skills but only the respondent's perception of their household skills. An item in the scale for planning that Stancu et al. (2016) used was: The shopping trips are usually planned in advance (shopping lists are made, inventories are checked, etc.), which had to be answered on a 7 point-Likert scale from strongly disagree to strongly agree. This item was not considered unambiguous, because it refers both to the making of shopping lists, the checking of inventory, and it includes etc., which can be interpreted in various ways. Therefore, the elements of the item were separated into two new items, one covering the making of shopping lists (Q42.1) and one covering the checking of food inventories (Q42.2). Although Stancu et al. (2016) consider the checking of food inventories as part of the people's planning routines, it can also be considered to fall under the factor of stock management. Therefore, these factors were merged into one factor, which included the two adapted items (Q42.1, Q42.2), and the second item in the scale Stancu et al. (2016) for measuring planning (Q42.3). The answer categories were adapted to a scale from a research by Setti, Falasconi, Segrè, Cusano, and Vittuari (2016) to a 7 point-Likert scale from never to always. This was done because a scale that runs from completely disagree to completely agree on a statement reflecting that you usually make a shopping list, can restrict respondents who always make a shopping list in indicating their behaviour. The factors preparation skills and estimation of necessary amounts were also merged into one factor, because the items reflect both factors. The items are developed from the research by Setti et al. (2016) (Q42.4, Q42.5, Q43).

The M-factors that covers one's health concern is measured by an existing scale (Q6) developed by Kähkönen and Tuorila (1999). The M-factors concerning the healthiness and appeal of food products are not general M-factors, but relate to the specific case of cheese and yoghurt. The healthiness of cheese and yoghurt is measured by a bipolar scale that runs from good for your health to bad for your health (Q14.1, Q28.1). The extent to which people find the cheese and yoghurt appealing, is operationalized by asking people to judge the taste instead of the extent to which they find the product appealing, because taste seems more comprehensible. The respondents were asked to judge the cheese and yoghurt that they buy the most frequent on a bipolar scale from distasteful to tasty (Q14.2, Q28.2).

T-factors

The T-factors were measured by developing items using the identified cues, and therefore the items were designed specifically for cheese and yoghurt. The T-factors include the cues that were relevant during the shopping, transportation, storage and the consumption of cheese and yoghurt. Only the cues appeared relevant for people's decision to consume or dispose cheese or yoghurt were included in the survey. This was decided based on the interviews, by continuing to ask why people paid attention to a certain cue. Each relevant cue was converted into an item, which were to be answered on a 7-point Likert scale from completely disagree to completely agree (Q15, Q16, Q29, Q30).

Quality perception factors

The quality perception factors that were identified in literature were sensory perception, perceived riskiness of the product and the expiration date. People's sensory perception was measured by a statement on whether people would dispose cheese or yoghurt in case it showed a particular characteristic (Q21, Q34). These characteristics were based on the cues that were

revealed by the interviews. The cues that were deemed relevant were the cues that were revealed by the questions that concerned when people would dispose cheese or yoghurt and how they would judge the quality of both products, and with the additional requirement that the cues were considered relevant for food waste. An additional question for cheese was developed, concerning an alternative use in case a particular characteristic would be present and people would decide not to dispose the cheese completely. This was included because the interviews revealed that for some people these situations occur (Q21).

The second quality perception factor was the expiration date. The influence of this factor was measured by an item stating the consideration of the expiration date when judging the quality of cheese, and similar for yoghurt (Q20.1, Q33.1). Furthermore, a passed expiration date was also included as a characteristic that could make people decide to dispose yoghurt (Q34.12).

The quality perception factor of perceived riskiness was measured by a scale that was developed based on the definition of risk. Yeung & Morris (2001) defined risk as the chance that a certain hazard occurs multiplied with the magnitude of occurrence. The chance of a hazard in this case depends on the product's susceptibility to spoilage, and the chance of a food poisoning after its consumption. The susceptibility to spoilage of yoghurt was measured by the asking respondents to indicate the extent to which they agree with the statement: 'yoghurt is susceptible to spoilage', on a seven point Likert scale (Q31.1). For cheese, the perceived susceptibility to spoilage was asked separately for a piece, sliced and grated cheese, because this was expected to vary (Q18.1, Q18.2, Q18.3). The chance of a food poisoning was asked separately for cheese and yoghurt, and this was also measured on a seven point Likert scale (Q18.4, Q31.2). The second part of the definition of risk represents the magnitude of the hazard, which was measured by asking how respondents would experience a food poisoning, both for after consuming spoiled cheese (Q19) and for after consuming spoiled yoghurt (Q32). This was answered on a seven-point scale that runs from extremely comfortable to extremely uncomfortable.

Finally, the knowledge on the time that a product's package has been open is a quality perception factor that is acknowledged in literature (Evans, 2011), and also a factor that was revealed during the interviews. This item was measured by a statement on whether the respondents considers the time that a package of cheese or yoghurt has been open in judging the quality of the product (Q20.2, Q33.2).

Additional factors

Besides the dependent and independent variables, the survey contained some additional variables that might explain certain outcomes. The survey started with demographic questions, like age (Q2), gender (Q3), level of education (Q4) and household size (Q5), in order to investigate whether these variables have an influence on the disposal of cheese and yoghurt. Furthermore, some characteristics concerning people's cheese and yoghurt consumption were asked. First of all, the frequency of cheese and yoghurt consumption (Q7 Q23), because only people who consume cheese and yoghurt on a regular bases were considered as useful respondents for the questions that specifically relate to cheese and yoghurt. The survey was designed to lead respondents who consume cheese or yoghurt half-yearly or less directly to the end of the survey, thus skipping the T-factors and quality perception factors of the product that they indicated to consume half-yearly or less. Secondly, the situations in which people consume cheese and yoghurt (Q8, Q24), because this is expected to correlate with people's perception of the healthiness of the product and the extent to which they find the product appealing.

Also some characteristics of the cheese that the respondents buy the most frequent were asked, including its form (Q9), package (Q10, Q11), length of aging (Q12) and fat content (Q13). The form of cheese is included in the survey because it can influence the spoilage rate of cheese. Cheese is more susceptible to moisture loss and surface moulds when exposed to air, and the form of cheese determines the proportion of cheese that is exposed to (Gibbons et al., 1979; Johnson, 2003). The package in which people buy cheese was incorporated in the survey as an additional variable, because of the many possible options and their different perceived influences on the quality of cheese. The interviewees agreed that the type of package influences the quality of cheese, however, they had no consensus on what the influences of different types

of packages. The length of aging was also included as an additional variable in the survey, because the interviews revealed that they did not take this into account because of reasons that are relevant to food waste. However, some had the impression that the spoilage rate of young cheese would be higher than of mature cheese, which can influence people's disposal of cheese. The reason that the cheese's fat content was incorporated in the survey was because of the expected influence of the perceived healthiness of the product on food waste or the respondents' health concern, which is expected to be reflected by the fat content of the cheese (Block et al., 2016).

As for cheese, also some characteristics of the yoghurt that the respondents buy the most frequent were asked. The yoghurt's fat content was incorporated in the survey for the same reason as the cheese's fat content, i.e. the expected effect of the perceived healthiness of the product on its disposal (Q26). Furthermore, the type (Q25) and the type of package (Q27) of the yoghurt were incorporated in the survey, because it might influence the rate of spoilage of the product, and thus the disposal.

All questions that were designed to be answered on a scale were provided with a seven point Likert scale or a seven point bipolar scale. The choice for a seven point scale was made because according to Preston and Colman (2000) a scale is more reliable once it has more options. However, larger scales than seven points can more difficult to provide appropriate labels for. The complete survey can be found in Appendix III; this is a translated version as the original version that was used for data collection was in Dutch.

4.1.3 Method of analysis

First of all, the gained data was explored by investigating the frequencies of the variables. This provided an impression of the characteristics of the respondents in terms of their gender, age, level of education and household size. Also the respondents' health concern was explored, by assessing the median and bar charts of the relevant variables (Q6). The mean was not assessed because equal differences between the answer categories cannot be assumed. The frequencies of the variables concerning the cheese and yoghurt consumption were also requested, which revealed the situations in which the respondents consume cheese and yoghurt, the types of cheese and yoghurt that is consumed most frequently, and the respondent's ideas of the healthiness and tastiness of the cheese and yoghurt that they consume the most frequently.

Data reduction

Data reduction was performed in order to reduce the amount of variables and consequently the complexity of the data set. Another reason to reduce the data was that for measuring some factors multiple variables were included in the survey.

Data reduction was achieved by applying factor analyses, in order to find clusters of variables (Field, 2013). Several factor analyses were applied to the data. First of all, the M-factors; one for the variables intended to measure health concern (Q6), because of the length and diversity of the list of variables and the expectation that some variables measured similar dimensions, and one for the general M-factors (Q39, Q40, Q41, Q42, Q43), in order to assess the validity of the variables used to measure the M-factors. Secondly, factor analyses were applied to the T-factors; one for the variables related to the shopping of cheese (Q15), one for the storage of cheese (Q16), one for the shopping of yoghurt (Q29) and one for the storage of yoghurt (Q30). Finally, the quality perception factors; factor analyses were applied to the variables related to the sensory perception of cheese (Q21) and the sensory perception of yoghurt (Q34).

The factor analyses were run by first investigating the correlation matrix of variables in order to detect potential problems of multicollinearity in the data. In case of no correlations higher than 0.9, there can be concluded that there is no problem of multicollinearity (Field, 2013). Secondly, there was looked at KMO test statistic, in order to assure an adequate sample size for factor analysis, which applies if this value is not lower than 0.5. After that, factors were extracted using principal axis factoring, based on Kaiser's criteria, i.e. eigenvalues >1 (Field, 2013). The

extracted factors were investigated by the rotated factor matrix. Variables were assigned to the factor that indicated the highest rotated loading. The content validity of the factors in the health concern factor analysis was investigated by comparing the content of the assigned variables. The content validity of the M-factors factor analysis was investigated by comparing the intended variables for measuring factors to the assigned variables for factors. Cronbach's alpha was used as an additional check for whether the assigned variables are valid in measuring the M-factors and health concern dimensions. Values of above 0.8 were considered as reflecting a good scale, values above 0.7 were considered acceptably reliable, and values of above 0.6 were considered as reflecting a questionable scale (George & Mallery, 2003).

There was checked whether deleting variables from the factors would substantially increase Cronbach's alpha, and this was considered based on the content of the variables. Then, the factors were saved as variables applying Anderson-Rubin's method, which ensured that the factor scores are uncorrelated (Field, 2013).

Another method for data reduction was used for the variables related to the quality perception factor of perceived riskiness of the product. The variables in the survey related to this factor were based on the definition of risk, i.e. the multiplication of the chance of a hazard by the magnitude of its occurrence (Yeung & Morris, 2001). Therefore, two new variables were computed by multiplying the perceived susceptibility to spoilage (Q18.1, Q18.2, Q18.3, Q31.1) by the perceived chance of a food poisoning after consuming the spoiled product (Q18.4, Q31.2) by the perceived magnitude of a food poisoning (Q19, Q32). This resulted in two new variables that measure the perceived riskiness of cheese and the perceived riskiness of yoghurt. The susceptibility to spoilage of cheese is expected to vary for a piece, sliced and grated cheese. Cronbach's alpha is used to find evidence that the items are not measuring the same. However, in case this is not shown, i.e. Cronbach's alpha indicates a reliable scale, the items will be combined into a factor.

Effects on disposal

In order to investigate the effects of the M-factors, T-factors, quality perception factors and additional variables on the respondent's behaviour concerning the disposal of cheese and yoghurt, several tests were used. The dependent variable was the disposal of cheese and yoghurt, which was measured by the frequency and the amount of disposal for both products. Since there were two dependent variables for both cheese and yoghurt, the effects of the M-factors, T-factors, quality perception factors and additional variables were investigated both for the frequency and the amount of the disposal. Table 2 provides an overview of the tests that were executed. The tests that were not executed concern irrelevant tests, e.g. the effect of cues that consumers pay attention to during shopping of cheese on the frequency of yoghurt disposal.

The dependent variables were of an ordinal character; hence either a factorial ANOVA or a multiple regression analysis was a suitable test, depending on the type of independent variable that was incorporated in the test. The majority of the independent variables in the test concerned ordinal variables as well, thus a regression analysis was an appropriate test (Field, 2013). This applied for the M-factors, T-factors and quality perception factors. First of all, the model was checked on the assumption of linearity. This was checked by a scatter matrix, where there was specifically looked at the relationships between the independent variables and the dependent variable. If there seemed to be no linear relationship between any of the independent variables and the dependent variables, it was concluded that the independent variables do not have an effect on the dependent variable. However, if at least one of the independent variables seems to be linearly related to the dependent variable, the assumption was met and the test was executed. The significance values were checked, in order to see whether the suggested relationship appears to be significant. Then, the model was checked on its assumptions of normality, by investigating a Q-Q plot of the residuals, and homoscedascity of variances, by plotting the predicted values vs. the residuals. In case the assumptions were not met, the results were carefully interpreted.

Table 2: Overview of executed tests, in terms of the dependent and independent variables. The tests that were executed are marked by a tick.

Dependent variables Independent variables		Frequen cy cheese disposal	Amount cheese dispose d	Frequen cy yoghurt disposal	Amount yoghurt dispose d
M-factors	Health concern (Q6)	✓	✓	✓	✓
	General M-factors (Q39, Q40, Q41, Q42, Q43)	✓	✓	✓	✓
	Healthiness and tastiness cheese (Q14)	✓	✓		
	Healthiness and tastiness yoghurt (Q28)			✓	✓
T-factors	Shopping cheese (Q15)	✓	✓		
	Storage cheese (Q16)	✓	✓		
	Shopping yoghurt (Q29)			✓	✓
	Storage yoghurt (Q30)			✓	✓
Quality perception factors	Sensory perception cheese (Q21)	✓	✓		
	Sensory perception yoghurt (Q34)			✓	✓
	Perceived riskiness cheese (Q18, Q19)	✓	✓		
	Perceived riskiness yoghurt (Q31, Q32)			✓	✓
	Expiration date cheese (Q20.1)	✓	✓		
	Expiration date yoghurt (Q33.1)			✓	✓
	Knowledge on time package is open cheese (Q20.2)	✓	✓		
	Knowledge on time package is open yoghurt (Q33.2)			✓	✓
Additional factors	Demographics (Q2, Q3, Q4, Q5)	✓	✓	✓	✓
	Characteristics of cheese (Q9, Q10, Q11, Q12, Q13)	✓	✓		
	Characteristics of yoghurt (Q25, Q26, Q27)			✓	✓

The additional variables were tested by ANOVA, because these also concerned also nominal variables. The additional factors concerned the demographics, the characteristics of cheese and the characteristics of yoghurt. ANOVA requires the data to meet several assumptions, which are a linear relationship between the predictor variables and the outcome variable, the residuals should be normally distributed, and homoscedastic variances among the groups (Field, 2013). For every ANOVA that was executed, the assumptions were tested first. The assumption of a linear relationship was tested by investigating the plot of the predicted values versus the residuals, which also provided insight into whether the assumption of homoscedasticity was met. Nevertheless, the latter was also explored by Levene's test; non-significance indicates that the assumption is met. The normality assumption was investigated by a Q-Q plot of the residuals (Field, 2013). In case the assumptions were not met, the results were carefully interpreted. After testing the assumptions, the ANOVA's were executed using SPSS. The independent variables that were reduced to factors were incorporated in the ANOVA as covariates, because these had become scale variables. The output provided significance values of the independent variables. If the significance value of an independent variable was < 0.05 , there was concluded that this variable had a significant effect on the dependent variable. The character of the effect was investigated by a scatter plot; the independent variable defined on the X-axis, and the dependent variable defined on the Y-axis. Hereafter, a linear line based on the least squares was added to the plot, which indicates whether the relationship between the dependent and independent variables were positive or negative.

4.2 Results survey

4.2.1 Characteristics of respondents

Out of 185 respondents, 152 completely filled in the survey. The survey has been opened 13 times without the respondent giving any response. Only these cases are left out of the analysis, since the other unfinished respondents did fill in the survey to a considerable extent to incorporate their data. This results in a total of 172 respondents. The majority of the respondents were female; 124 out of 171 (one response was missing). The mean age of the respondents is 46, with a standard deviation of 16.454. The ages of the respondents seem normally distributed around this age, however, there is also a large group of respondents around the age of early 20. One case shows an age of 6, however, there is no need to remove this case because the other variables do not indicate that the respondent was actually 6 years old. The level of education among the respondents is quite high, the majority of the respondents is enrolled in or graduated from higher education (37.2%) or university (30.8%). The most represented household size of the respondents is two (39.5%). An overview of the demographics of the respondents can be found in Appendix IV.

Cheese and yoghurt consumption

The majority of the respondents eat Dutch cheese every day (56.8%), or every week (30.8%). Dutch cheese is most often consumed on a sandwich, followed by in a hot meal. The majority of the respondents buys cheese most often in a piece (64.6%), followed by sliced cheese (26.8%) and grated cheese (8.5%). Most of the respondents buy most often young mature (36.6%) or mature cheese (32.3%). The majority of the respondents is neutral in their belief whether the Dutch cheese that they consume most often is good or bad for their health. The Dutch cheese that is consumed most often is considered as tasty by most of the respondents.

Yoghurt is consumed daily by 38.6% of the respondents and weekly by 21.6% of the respondents. Regular Dutch yoghurt is consumed the most by the respondents (64.7%), followed by Greek yoghurt (13.8%). The majority of the respondents believe that yoghurt is good for their health, and is tasty.

An overview of the respondent's cheese and yoghurt consumption is represented in Appendix V.

4.2.2 Data reduction

Data reduction was done for the M-factors, T-factors and quality perception factors.

M-factors

Factor analysis for the M-factors is executed for health concern and the general M-factors. Table 3 and Table 4 represent the results.

Table 3: Summary of factor analysis for the health concern scale.

Item	Rotated factor loadings		
	Concern for cardiovascular diseases	Concern for overweight	Concern for the intake of unhealthy nutrients
Q6.8 Heart	0.875	0.261	0.202
Q6.7 Blood pressure	0.868	0.120	0.308
Q6.9 Cholesterol	0.817	0.231	0.173
Q6.10 Weight	0.186	0.804	0.071
Q6.4 Calories	0.181	0.800	0.243
Q6.2 Fat	0.180	0.762	0.356
Q6.3 Sugar	0.076	0.400	0.740
Q6.6 Additives	0.328	0.013	0.573
Q6.1 Salt	0.274	0.317	0.546
Eigenvalues	4.751	1.539	1.028
Cumulative % variance explained	47.513	62.900	73.185
Cronbach's alpha	0.93	0.85	0.72

Note: factor loadings that are highest per row appear in bold.

Table 4: Summary of factor analysis for the general M-factors after deleting Q42.5.

	Rotated factor loadings				
	Perceived household skills	Intention not to waste	Stock management	Perceived behavioural control	Estimation necessary amounts
Q41.1 Planning meals	0.792	0.063	0.271	-0.156	-0.034
Q41.2 Right amounts	0.749	0.150	0.211	-0.133	-0.160
Q41.3 Planning the shopping	0.724	0.056	0.261	-0.125	0.007
Q41.4 Cooking	0.604	0.019	0.052	-0.077	-0.076
Q39.2 Intend not to throw food away	0.068	0.847	0.138	-0.170	0.000
Q39.1 Try not to throw food away	0.086	0.788	0.054	-0.202	0.016
Q39.3 Goal is to not throw food away	0.042	0.674	0.044	-0.144	-0.094
Q42.1 Frequency of making shopping lists	0.177	0.080	0.731	0.015	-0.054
Q42.2 Frequency of checking inventory	0.157	0.186	0.611	-0.070	0.131
Q42.3 Frequency of planning meals	0.281	-0.049	0.518	-0.051	-0.129
Q40.1 Wasting food: avoidable / unavoidable	-0.099	-0.221	0.057	0.818	-0.034
Q40.3 Loading environment: avoidable / unavoidable	-0.199	-0.251	-0.142	0.553	0.034
Q40.2 Not throw food away: easy / difficult	-0.121	-0.101	-0.046	0.425	0.268
Q43 Risk too little food	-0.056	0.015	0.065	0.030	0.870
Q42.4 Excess of food prepared	-0.212	-0.131	-0.233	0.199	0.364
Eigenvalues	4.332	2.211	1.513	1.213	1.039
Cumulative % variance explained	28.881	43.618	53.707	61.792	68.721
Cronbach's alpha	0.84	0.82	0.68	0.66	0.47

Note: factor loadings that are highest per row appear in bold.

An existing scale was used for measuring health concern (Q6). Factor analysis results reduced the variables to three factors. The item that covers the concern for getting sufficient energy from food (Q6.5) does not clearly fall into one of the components, thus, this item is deleted from the analysis.

The factor analysis that is applied for the general M-factors indicates that the items used in order to measure intention not to waste, perceived behavioural control, and planning and stock management effectively measure these factors. The PCA also reveals that the factor perceived household skills is also reflected by item Q42.5, which was intended for measuring preparation skills and estimation necessary amounts. However, since Cronbach's alpha for perceived household skills increases considerably when this item is removed, thus, the original items were used for measuring perceived household skills. The items used for measuring preparation skills and estimation necessary amounts do not effectively measure this factor (Cronbach's alpha < 0.5), hence, these items will be analysed separately.

T-factors

Four factor analyses are executed for data reduction of the T-factors, of which the results can be found in the following tables; Table 5 presents the variables related to the shopping of cheese, Table 6 presents the variables related to the storage of cheese, Table 7 presents the variables related to the shopping of yoghurt and Table 8 presents the variables related to the storage of yoghurt.

Table 5: Summary of factor analysis for the technological factors of cheese during shopping

Item	Rotated factor loadings			
	1: Rind	2: Transport	3	4
Q15.8 Rind colour	0.856	0.278	0.230	0.128
Q15.7 Rind size	0.799	0.154	0.230	0.209
Q15.10 Transport method	0.136	0.807	0.122	0.004
Q15.9 Temperature outside	0.368	0.583	0.138	0.263
Q15.11 Transport time	0.091	0.561	0.118	-0.019
Q15.6 Moulds	0.138	0.080	0.723	0.061
Q15.4 Expiration date	0.170	0.253	0.632	0.127
Q15.1 Weight	-0.015	0.023	0.010	0.669
Q15.2 Shape	0.126	-0.092	0.103	0.550
Q15.3 Special offer	0.110	0.082	0.117	0.379
Q15.4 Discount sticker	0.131	0.093	-0.046	0.178
Eigenvalues	3.410	1.556	1.202	1.054
Cumulative % variance explained	30.996	45.143	56.073	65.651
Cronbach's alpha	0.891	0.751	0.651	0.512

Note: factor loadings that are highest per row appear in bold.

Table 6: Summary of factor analysis for the technological factors of cheese during storage.

Item	Rotated factor loadings		
	1	2	3
Q16.4 Opening package finish time	0.661	0.114	-0.011
Q16.6 Touching	0.552	0.282	-0.011
Q16.5 Original package	0.133	0.780	-0.024
Q16.2 Fridge location	0.409	0.551	-0.244
Q16.1 Fridge	0.043	0.208	0.204
Q16.3 Opening package	0.535	-0.187	0.739
Q16.7 Remove crust	0.197	0.028	-0.439
Eigenvalues	2.157	1.408	1.091
Cumulative % variance explained	30.812	50.925	66.511
Cronbach's alpha	0.498	0.244	-0.566

Note: factor loadings that are highest per row appear in bold.

Table 7: Summary of factor analysis for the technological factors of yoghurt during shopping

Item	Rotated Factor loadings			
	1	2	3	4
Q29.9 Transport method	0.964	0.039	-0.026	0.036
Q29.8 Temperature outside	0.848	0.022	0.024	0.131
Q29.10 Transport time	0.786	0.223	-0.045	-0.108
Q29.7 Temperature package	0.379	0.281	-0.216	0.086
Q29.4 Amount	0.144	0.748	0.133	-0.038
Q29.3 Expiration date	0.202	0.700	-0.326	0.162
Q29.5 Not damaged package	-0.010	0.514	0.099	0.288
Q29.1 Special offer	0.009	-0.001	0.882	0.187
Q29.2 Discount date	-0.090	0.053	0.577	-0.365
Q29.6 Twistable cap	0.039	0.186	-0.017	0.683
Eigenvalues	3.153	1.716	1.588	1.066
Cumulative % variance explained	31.530	48.689	64.565	75.223
Cronbach's alpha	0.822	0.673	0.627	-

Note: factor loadings that are highest per row appear in bold.

Table 8: Summary of factor analysis for the technological factors of yoghurt during storage.

Item	Rotated factor loadings	
	1	2
Q30.5 Stir yoghurt	0.808	0.105
Q30.1 Storage yoghurt fridge	0.754	-0.172
Q30.6 Opening package finish time	0.607	0.290
Q30.3 Opening package	0.355	0.326
Q30.4 Shake package	0.314	0.811
Q30.2 Fridge location	-0.157	0.777
Eigenvalues	2.084	1.248
Cumulative % variance explained	34.726	55.519
Cronbach's alpha	0.474	0.323

Note: factor loadings that are highest per row appear in bold.

The variables related to the shopping of cheese reduce to four factors, of which only the first two are considered useful. The factors extracted for the storage of cheese are unreliable and low in content validity, thus, these variables will be considered separately.

The factor analysis performed for the variables that relate to the shopping of yoghurt resulted in four factors. The first factor is altered into a factor that purely reflects the transportation of yoghurt by deleting the temperature package variable from the factor. The remaining variables are analysed separately. The factor analysis related to the storage of yoghurt was not executable using principal axis factoring; hence principal component analysis was applied. As the extracted factors were either not reliable, or low in content validity, the variables related to the storage of yoghurt will be analysed separately.

Quality perception factors

The quality perception factors consist out of sensory perception, the expiration date, and the perceived riskiness of the product. Data can be reduced for measuring sensory perception and perceived riskiness of the product, because both are measured by multiple variables. Factor analysis is applied for data reduction of the sensory perception variables, of which the results can be found in Table 9 for cheese and Table 10 for yoghurt.

Table 9: Summary of factor analysis for the quality factor of sensory perception of cheese.

Item	Rotated factor loadings			
	Hardness and dryness	2	3	4
Q21.6 Dried out	0.797	0.163	0.020	0.128
Q21.5 Hard to safely cut	0.708	0.113	0.005	-0.040
Q21.10 Bursts	0.583	0.071	-0.168	0.283
Q21.9 Not soft	0.559	0.131	0.098	0.238
Q21.3 Deviating smell	-0.076	0.762	0.016	0.022
Q21.4 Rind	0.406	0.635	-0.135	0.109
Q21.2 Deviating colour	0.224	0.591	-0.135	0.119
Q21.7 Bulged shape	0.283	0.463	0.193	0.430
Q21.1 Moulds	0.410	0.442	-0.335	0.071
Q20.1 Expiration date	-0.089	0.025	0.870	0.027
Q20.2 Package open	0.102	-0.185	0.852	-0.117
Q21.8 Not tasty	0.199	0.113	-0.130	0.850
Eigenvalues	4.004	1.950	1.484	1.039
Cumulative % variance explained	33.364	49.612	61.978	70.636
Cronbach's alpha	0.760	0.766	0.809	-

Note: factor loadings that are highest per row appear in bold.

Table 10: Summary of factor analysis for the quality factor of sensory perception of yoghurt.

Item	Rotated factor loadings		
	1	Package	3
Q34.11 Deviating taste	0.945	0.042	0.168
Q34.10 Deviating smell	0.895	0.075	0.283
Q34.8 Deviating colour	0.818	0.078	0.265
Q34.7 Moulds	0.797	0.040	-0.018
Q34.5 Package moulds	0.424	0.320	0.235
Q34.3 Package leakage	0.075	0.945	0.090
Q34.4 Cap leakage	0.003	0.852	0.035
Q34.1 Package dirty	0.120	0.741	0.230
Q34.9 Lumps	0.221	0.032	0.644
Q34.6 Liquid layer	0.096	0.279	0.428
Eigenvalues	4.170	2.361	1.042
Cumulative % variance explained	41.704	65.310	75.734
Cronbach's alpha	0.861	0.890	0.534

Note: factor loadings that are highest per row appear in bold.

The factor analysis performed for the variables that relate to the sensory perception of cheese resulted in four factors. The first factor loaded with variables that all relate to the hardness and dryness of cheese, and is acceptably reliable, Cronbach's alpha = 0.760. This factor was maintained, however, the other variables were analysed separately because of the proposed factors do not represent a similar dimension.

The factor analysis of the variables that represent the sensory perception of yoghurt, results in three factors. Only the second factor maintained because it is loaded with variables that are all related to the package of yoghurt, and it forms a reliable scale, Cronbach's alpha = 0.890.

The data for measuring perceived riskiness of cheese and yoghurt was reduced by computing two new variables. An element in the new variable for measuring perceived riskiness of cheese is the perceived chance of decay of cheese. This is measured by three variables, concerning the perceived chance of decay of a piece of cheese, sliced cheese and grated cheese. These variables were reduced to a factor, which forms a reliable scale for measuring the perceived chance of decay of cheese, Cronbach's alpha = 0.83. The computed variables that measure perceived riskiness of cheese and yoghurt are:

- Perceived riskiness cheese = perceived susceptibility to spoilage cheese * chance food poisoning after consuming spoiled cheese * magnitude of food poisoning after consuming spoiled cheese.
- Perceived riskiness yoghurt = perceived susceptibility to spoilage yoghurt * chance food poisoning after consuming spoiled yoghurt * magnitude of food poisoning after consuming spoiled yoghurt.

4.2.3 Effects on disposal

The following section first describes the effects of the M-factors, T-factors and quality perception factors on cheese and yoghurt disposal. After that follows a description of the results of the effects of the additional factors on cheese and yoghurt disposal.

Influence of M-factors, T-factors and quality perception factors on cheese and yoghurt disposal

The summaries of the regression analyses for the influence of the factors on cheese and yoghurt disposal are presented in Table 11,

Table 12,

Table 13 and Table 14, for the effects on respectively the frequency of cheese disposal, the amount of cheese disposed, the frequency of yoghurt disposal and the amount of yoghurt disposed. Note that only the regressors that appeared significant are presented in the tables due to the high number of variables that was incorporated in the analysis, and these are provided with the corresponding regression coefficient (b) and level of significance (p-value). The assumptions that were tested are linear relationships between the independent variables and the dependent variable (L), normality of the residuals (N) and homoscedasticity of the variances (H).

Table 11: Summary of regression analysis for the frequency of cheese disposal.

Independent variables			Frequency cheese disposal				
Executed regression tests on frequency cheese disposal		Significant regressors	b	p-value	Assumptions		
					L	N	H
M-factors	Health concern	Factor: Overweight	-0.210	0.045	✓	✗	✗
	General M-factors	-	-	-	-	-	-
	Healthiness and tastiness cheese	Perceived healthiness cheese	0.456	0.000	✓	✗	✗
		Fat content cheese	0.337	0.007	✓	✗	✗
T-factors	Shopping cheese	-			✗		
	Storage cheese	Removing crust	0.234	0.049	✓	✗	✗
Quality perception factors	Sensory perception cheese	Factor: hardness and dryness	0.414	0.040	✓	✗	✗
		Smell	0.580	0.036	✓	✗	✗
	Expiration date cheese	-	-	-	-	-	-
	Perceived riskiness cheese	-	-	-	-	-	-
	Knowledge on time package is open cheese	-	-	-	-	-	-

Table 12: Summary of regression analysis for the amount of cheese disposed.

Independent variables			Amount of cheese disposed				
Executed regression tests on amount of cheese disposed		Significant regressors	b	p-value	Assumptions		
					L	N	H
M-factors	Health concern	Factor: Overweight	-0.201	0.023	✓	✗	✗
	General M-factors	Perceived household skills	-0.278	0.001	✓	✗	✗
	Healthiness and tastiness cheese	Perceived healthiness cheese	-0.161	0.048	✓	✗	✗
T-factors	Shopping cheese	Expiration date	0.142	0.002	✗		
	Storage cheese	Refrigerator	0.704	0.030	✓	✗	✗
Quality perception factors	Sensory perception cheese	-	-	-	-	-	-
		-	-	-	-	-	-
	Expiration date cheese	-	-	-	-	-	-
	Perceived riskiness cheese	-	-	-	-	-	-
	Knowledge on time package is open cheese	-	-	-	-	-	-

Table 13: Summary of regression analysis for the frequency of yoghurt disposal.

Independent variables			Frequency of yoghurt disposal				
Executed regression tests on frequency of yoghurt disposal		Significant regressors	b	p-value	Assumptions		
					L	N	H
M-factors	Health concern	-	-	-	-	-	-
	General M-factors	Intention not to waste	0.215	0.043	✓	✗	✗
	Healthiness and tastiness yoghurt	Perceived behavioural control	-0.261	0.015	✓	✗	✗
T-factors	Shopping yoghurt	Perceived healthiness yoghurt	0.067	0.003	✓	✗	✗
	Storage yoghurt	-	-	-	-	-	-
Quality perception factors	Sensory perception yoghurt	Lumps	-0.301	0.002	✓	✗	✗
	Expiration date yoghurt	Expiration date yoghurt	-0.179	0.003	✗	✗	✗
	Perceived riskiness yoghurt	-	-	-	-	-	-
	Knowledge on time package is open yoghurt	-	-	-	-	-	-

Table 14: Summary of regression analysis for the amount of yoghurt disposed.

Independent variables			Frequency of yoghurt disposal				
Executed regression tests on frequency of yoghurt disposal		Significant regressors	b	p-value	Assumptions		
					L	N	H
M-factors	Health concern	Factor: overweight	0.272	0.007	✓	✗	✗
	General M-factors	Perceived household skills	-0.278	0.001	✓	✗	✗
	Healthiness and tastiness yoghurt	Perceived healthiness yoghurt	-0.284	0.015	✓	✗	✗
T-factors	Shopping yoghurt	-	-	-	-	-	-
	Storage yoghurt	Refrigerator location	-0.213	0.020	✓	✗	✗
Quality perception factors	Sensory perception yoghurt	Package moulds	-0.334	0.005	✓	✗	✗
	Expiration date yoghurt	Expiration date yoghurt	0.153	0.006	✓	✗	✗
	Perceived riskiness yoghurt	-	-	-	-	-	-
	Knowledge on time package is open yoghurt	-	-	-	-	-	-

The influence of the M-factors is concerns the effect of people's health concern on disposal, the effect of the general M-factors on disposal, and the effect of the healthiness and tastiness of the product on disposal. It is shown that a health concern for overweight significantly predicts the frequency of cheese disposal, $b = -0.210$, $p = 0.045$, and the amount of cheese disposed, $b = 0.201$, $p = 0.023$. The effect of health concern on the frequency of yoghurt disposal was non-significant, however, the amount of yoghurt disposed is significantly predicted by a concern for overweight, $b = 0.272$, $p = 0.007$. Perceived household skills significantly predicts the amount of cheese disposed, $b = -0.278$, $p = 0.001$, and the amount of yoghurt disposed, $b = -0.370$, $p = 0.000$. The variables that are significant predictors for the frequency of yoghurt disposal are intention not to waste, $b = 0.215$, $p = 0.043$ and perceived behavioural control, $b = -0.261$, $p = 0.015$. Perceived healthiness of cheese significantly predict the frequency of cheese disposal, $b = 0.456$, $p = 0.000$, and the amount of cheese disposed, $b = -0.161$, $p = 0.048$. The cheese's fat content also significantly predicts frequency of cheese disposal, $b = 0.337$, $p = 0.007$. Perceived healthiness of yoghurt significantly predicts the frequency of yoghurt disposal, $b = 0.367$, $p = 0.003$, and the amount of yoghurt disposed, $b = -0.284$, $p = 0.015$.

The T-factors concern the relevant food waste aspects that consumers pay attention to during shopping and storage of cheese and yoghurt. The frequency of cheese disposal is not significantly predicted by any of the variables that consumers consider during shopping cheese. However, the amount of cheese disposed is significantly predicted by the extent to which a respondent pays attention the product's expiration date, $b = 0.142$, $p = 0.02$. The removal of a cheese's crust completely at the first moment of consumption significantly predicts the frequency of cheese disposal $b = 0.234$, $p = 0.049$. Storing cheese in the fridge significantly predicts the amount of cheese disposed, $b = 0.704$, $p = 0.030$. The variables that consumers pay attention to when they buy yoghurt significantly predict the frequency of yoghurt disposal and the amount of yoghurt disposed. However, the extent to which a respondents pays attention to the location within the fridge when storing yoghurt, does significantly predict the amount of yoghurt that one disposes, $b = -0.213$, $p = 0.020$.

The quality perception factors concern the sensory perception of the product, the expiration date, the perceived riskiness of the product and the knowledge on the time that the product's package has been open. The factor hardness and dryness of cheese, $b = 0.414$, $p = 0.040$, and smell, $b = 0.580$, $p = 0.036$ significantly predict the frequency of cheese disposal. The amount of cheese disposed is not significantly predicted by any of the sensory perception variables. The extent to which respondents agree on disposing yoghurt in case it shows lumps, $b = -0.301$, $p = 0.002$ significantly predicts the frequency of the respondent's yoghurt disposal. The extent that respondents agree to dispose yoghurt in case its package shows moulds, $b = -0.334$, $p = 0.005$, significantly predicts the amount of yoghurt that is disposed. The effect of the expiration date on cheese and yoghurt disposal is non-significant for the disposal of cheese, and significant for both the frequency of yoghurt disposal, $b = -0.179$, $p = 0.003$, and amount of yoghurt disposed, $b = 0.153$, $p = 0.006$. The perceived riskiness of the products and the knowledge on the time that a product's package has been open do not significantly predicts the disposal of cheese neither the disposal of yoghurt.

Influence of additional variables

The summaries of the ANOVA's for the effects of the additional variables are represented in Table 15 for the influence on cheese disposal and in

Table 16 for the influence on yoghurt disposal. Again, only the variables that appeared significant are presented in the tables. These are provided with the outcome of the test-statistic (F), the corresponding degrees of freedom (df1, df2), and the level of significance (P-value). Furthermore, a column for the assumptions (Ass.) is provided, which indicates a tick if all the assumptions are met.

Table 15: Summary of ANOVA for the influence of the additional factors on cheese disposal.

Significant additional variables	Frequency cheese disposal			Amount cheese disposed		
	F (df1, df2)	p-value	Ass.	F(df1, df2)	p-value	Ass.
Age	F (1, 144) = 14.731	.000	✗	F (1, 144) = 4.679	.032	✗
Household size	F (1, 144) = 4.028	.047	✗	-	-	✗
Package * Form	-	-	-	F = 3.840	.025	✗

Table 16: Summary of ANOVA for the influence of the additional factors on yoghurt disposal.

Significant additional variables	Frequency yoghurt disposal			Amount yoghurt disposed		
	F (df1, df2)	p-value	Ass.	F(df1, df2)	p-value	Ass.
Age	F (1, 110) = 8.360	.005	✗	-	-	-
Household size	F (1, 110) = 6.288		✗	-	-	-
Type * package	F (7, 80) = 2.832	0.011	✗	-	-	-

The additional factors concern the demographics, and the characteristics of cheese and yoghurt. Age has a significant effect on the frequency of cheese disposal $F (1, 144) = 14.731$, $p = 0.000$, and the amount of cheese disposed $F (1, 144) = 4.679$, $p = 0.032$. The older the respondent, the less frequent he disposes cheese and the lower the amount of cheese him disposes. Household size also has a significant effect on the frequency of cheese disposal, $F (1, 114) = 4.028$, $p = 0.047$; the larger the household size, the more frequent cheese disposal occurs. Age, $F (1, 110) = 8.360$, $p = 0.005$, and household size, $F (1, 110) = 6.288$, also have a significant effect on the frequency

of yoghurt disposal. The amount of yoghurt that is disposed is not significantly affected by any of the demographic variables. The characteristics of the cheese do not show a significant effect on the frequency of cheese disposal. However, for the amount of cheese disposed there appears to be a significant interaction effect between the package and the form of cheese, $F = 3.840$, $p = 0.025$. The frequency of yoghurt disposal is significantly affected by an interaction effect between the type of yoghurt that one consumes the most often, and its package, $F(7, 80) = 2.832$, $p = 0.011$. The profile plots of both interaction effects are represented in Appendix VI. The amount of yoghurt that is disposed is not significantly affected by any of the characteristics of the yoghurt.

4.3 Discussion results

First of all, the characteristics of the respondents are discussed on their representability of the study population, the Dutch consumers. Good aspects are that the sample size is large enough to provide reliable results, and the variance in the ages of the respondents is large. However, the females are over-represented in the sample, and the level of education among the respondents in the sample is higher than the level of education among the study population. Nevertheless, the sample of respondents is reasonably representative for the population of Dutch consumers.

Secondly, it should be stated that the majority of the assumptions related to the normality of residuals and homoscedasticity of variances are violated. Hence, the results should be carefully interpreted. Furthermore, the reliability of the dependent variables that were intended to measure the disposal of cheese and yoghurt should be doubted because of several reasons. First of all, the respondents can have given socially desirable answers on their food waste behaviour, since it can be a sensitive subject. Secondly, the amount of cheese and disposal is measured on a scale that runs from little to much, which is a subjective scale and the answer depends on the respondent's impression of what is little and what is much. Nevertheless, the use of a subjective scale is considered appropriate, because asking respondent to rate the amount of food that they disposed on an objective scale is more prone to errors (Jörissen et al., 2015). Furthermore, in earlier researches it was found that respondents underestimate food waste, which also negatively affects the reliability of the dependent variables (Rathje & Murphy, 2001). This may have caused many of the investigated effects on disposal to be insignificant.

The effect of the M-factors on disposal appeared to be significant for the concern for overweight, perceived healthiness of the product, perceived household skills, intention not to waste and perceived behavioural control.

People's concern for overweight significantly predicts the frequency of disposal of cheese and yoghurt. The more people concern about their weight, the more frequent they dispose cheese and yoghurt. The amount of food that is wasted is only for cheese significantly predicted by people's concern for overweight; the more people concern about their weight, the more cheese they dispose. Consistent with these results are the results concerning the effect of perceived healthiness of the product on the disposal of cheese and yoghurt; the healthier cheese or yoghurt is perceived, the less cheese or yoghurt is disposed. A possible explanation for the effects of both concern for overweight and perceived healthiness of the product is in line with the reasoning of Block et al. (2016), in explaining the effect of people's health related goals on food waste. In deciding to either consume or dispose a food product, health related goals like weight loss, counteract with food waste reduction. If a food is perceived as healthy, it does neither feel as a burden to consume it, nor as an accomplishment not to consume it. This suggests that if food is perceived as healthy, it would be disposed less. The effect of a cheese's fat content on cheese disposal contradicts this reasoning; people who buy cheese with a high fat content, dispose cheese less often than people who buy cheese with a low fat content. Therefore a suggestion for further research is provided; what is the relationship between the healthiness of a product and its disposal? Is the disposal of products that are expected to be perceived as healthy, e.g. fruits and vegetables, less than products that are perceived as unhealthy?

Perceived household skills significantly predict the amount of both cheese and yoghurt that is disposed. The effect appears to be negative, i.e. the weaker one perceives his own household

skills, the higher the amount of food one wastes. This finding is not completely supported by literature. Stancu et al. (2016) found a similar negative effect on food waste; however, it appeared to be an indirect effect through planning. Intention not to waste significantly predicts the frequency of yoghurt disposal; the higher the intention not to waste, the less frequent yoghurt disposal occurs. Stancu et al. (2016) support this finding, as they also found a negative relation between intention not to waste and food wasted. The finding that perceived behavioural control predicts the frequency of yoghurt disposal is also partly supported by literature. The present study shows that the higher the perceived behavioural control, the less food is wasted. This was also found by Stefan et al. (2013), however, the effect in their study appeared to be indirect through planning routines. The present study does not show significant evidence of the effect of planning on food waste; however, this could be due to the unreliability of the dependent variables.

Several T-factors appeared to be significant in explaining the disposal of cheese and yoghurt. First of all, the more someone takes the expiration date of cheese into consideration when buying cheese, the more cheese he wastes. This seems odd because people who take the expiration date into account can be expected to buy cheese that can be preserved for a longer time. Another predictor for cheese disposal is the removing a cheese's crust completely at the first moment of consumption. If someone removes the crust of cheese completely at the first moment of consumption, he disposes cheese less frequently. In finding explanations for this effect, it appears that the validity of the question of removing a cheese's crust can be questioned. If someone disagrees with removing a cheese's crust completely at the first moment of consumption, it can be interpreted in several ways. Either the crust is not removed completely, but is removed partly when the cheese will be consumed, or the crust is removed even before the first moment of consumption, e.g. just after purchase. In case of the first alternative, a possible explanation that not removing the crust completely can encourage the frequency of cheese disposal, is that it might become more difficult to remove a crust when a piece of cheese is already partly consumed. In the end, the remaining of the cheese still has some crust, which makes consumption more difficult, and consequently the cheese might be disposed. In case of the second alternative of interpreting the question, it implies that someone already removes the crust before the first moment of consumption, e.g. just after purchase. This increases the exposure to air, and thus the rate of spoilage. Consequently, the frequency of cheese disposal is higher. Furthermore, cheese disposal appears to be predicted by whether the cheese is stored in the fridge. The more someone agrees with storing cheese in the fridge, the higher the amount of cheese disposed. The relationship is curious, because storing cheese in the fridge is expected to slow down the rate of spoilage, and consequently the chance of disposal. An inspection of the frequency table of the variable related to the extent to which someone agrees with storing cheese in the fridge indicates that there is only one respondent that indicated to disagree with this statement, thus the linear relationship might be based on a deviating case.

The disposal of yoghurt is not significantly predicted by any of the aspects that consumers pay attention to when they buy yoghurt. This can be explained by the limitations of the study; the unreliability of the dependent variables. However, it can also imply that there is limited variation in the aspects that consumers consider for yoghurt in the store environment. This applies for the extent to which people consider the expiration date, the amount of yoghurt, potential damage of the package, and the aspects related to the transportation of yoghurt. Most people take the expiration date, amount of yoghurt and potential damage into account when they buy yoghurt, and do not consider the temperature outside, their transportation method and the transportation time between their home and the store. A significant predictor for yoghurt disposal that was relevant for the storage of yoghurt appears to be the location in the fridge. People who consider the location within the fridge into account when storing yoghurt seem to dispose less yoghurt. This finding seems curious, because if people pay attention to the location in the fridge, it can be expected that they store their yoghurt on a location that is most suitable, and thus has the lowest impact on the spoilage rate of the yoghurt.

The effects of the quality perception factors appeared to be significant for some of the sensory perception variables, the expiration date for the disposal of yoghurt, and insignificant for the perceived riskiness of the product and for the knowledge on the time that a product has been open.

The effect of sensory perception on the disposal of cheese is measured on a three point scale, with the options; not dispose at all, dispose partly, dispose completely. These variables are ordinal variables, because it concerns a sensible order, and thus they are analysed by regression. A point of discussion that raises here is that the scale only concerns three steps, thus reliability can be questioned. On the one hand, it would statically be more reliable to allow respondents to answer on a scale with more steps. On the other hand, more steps in the answer categories would decrease the interpretability of the steps. The option 'dispose partly' would have to be split up, which increases the chance of errors. Nevertheless, the hardness and dryness, and a deviating smell are significant predictors in the disposal of cheese. The more people agree to the extent that cheese is disposed once it is hard, dry and has a deviating smell, the more frequent they dispose cheese. The interviews revealed that the hardness and dryness of cheese is considered in a decision to consume or dispose cheese because it is associated with a decline in taste, or it is experienced to be unsafe to cut. The smell of cheese appeared to give an indication of its freshness and its safety. People's decision on consumption or disposal of cheese appears to depends on convenience, health and hedonic dimensions of the quality of cheese. Yoghurt disposal is significantly predicted by the extent to which people agree on disposing yoghurt in case it shows lumps and in case its package shows moulds. The more people agree on disposing yoghurt in case it shows lumps, the more frequent they dispose yoghurt.

The extent to which people rely on the expiration date of yoghurt significantly predicts the disposal of yoghurt. The more someone agrees with disposing yoghurt once the expiration date has passed, the more frequent he disposes yoghurt and the more yoghurt is disposed per moment of disposal. A possible explanation for this is that people who rely heavily on a product's expiration date are less likely to judge the quality of the yoghurt themselves based on their senses. Therefore, they might be more likely to dispose yoghurt that is still edible compared to people who rely less on the expiration date. The effect of the expiration date on the disposal of cheese is non-significant. This is consistent with the results from the interviews; most people do not consider the expiration date of cheese when they judge its quality, and decide on consumption or disposal. The perceived riskiness of the product and the knowledge on the time that a product's package is open do not have a significant effect on the disposal, neither for cheese, nor for yoghurt. A possible explanation for the perceived riskiness could be that there is little variation in the people's perceived riskiness of cheese and yoghurt.

Finally, the effects of the additional factors on cheese and yoghurt disposal are discussed. The results indicate that cheese and yoghurt disposal is higher among younger people, and larger households. The results concerning age are supported by literature; younger consumers are associated with more food waste (Stancu et al., 2016; WRAP, 2008). However, the results on the effects of household size contradict with literature. Several studies found that the amount of waste generated per person decreases with an increasing household size (Stancu et al., 2016; Williams et al., 2012). An explanation for this contradicting result is that the respondents reported the total cheese and yoghurt waste of their household, whereas literature considers the waste per person. These findings do get supported by literature because, indeed, the larger the household size, the more waste is generated on household level (WRAP, 2008).

The results of the effects of the characteristics of cheese indicate a significant interaction effect between the form of cheese and how it is packed. The profile plot indicates that sliced cheese get disposed more if it is packed in cheese paper than when it is packed in plastic, whereas a piece of cheese is disposed more when it is packed in plastic and less when it is packed in cheese paper. Grated cheese is disposed the most when it is packed in plastic. However, a cross table of the observed frequencies of the packages and the form of cheese indicates that there is limiting data on some of combinations of form and package, thus, the results are unreliable. The characteristics of yoghurt have a significant interaction effect of the type of package of yoghurt

and the type of the yoghurt itself, on the frequency of yoghurt disposal. Regular Dutch yoghurt in pack or bucket is disposed more often than when packed in a cup, whereas Greek yoghurt is less often disposed when packed in a pack than when packed in a cup. However, again the results are unreliable due to the limiting data on some combinations of type and package.

5. Conclusion

The aim of this research was to gain insight into how the consumer's quality perception of dairy is formed and consequently how this influences the consumer's decision to either consume or dispose dairy. The formation of the consumer's quality perception of dairy is formed by several factors, which can be divided into managerial factors, cues and factors that are relevant for the technological functions and quality perception factors. These factors influence the consumer's quality perception of cheese and yoghurt, and consequently determine their food waste behaviour.

The managerial factors that determine the consumer's disposal of dairy are perceived household skills, intention not to waste, perceived behavioural control, concern for overweight, and the perceived healthiness of the product. Food waste is enhanced by a low perception of one's household skills, a low intention not to waste and low perceived behavioural control. The latter effect is indirect. Furthermore, the higher the concern for overweight and the lower the perceived healthiness of the product, the more dairy waste is generated.

The factors and cues that are relevant for the technological functions are product specific. Food waste of cheese is influenced by the expiration date as a cue during shopping, and crust removal as a factor influencing storage. The more someone takes the expiration date of cheese into consideration when buying cheese, the more cheese he wastes. Complete removal of a cheese's at the first moment of consumption, reduces the disposal frequency of cheese. Food waste of yoghurt is influenced by its storage location within the fridge. People who consider the location within the fridge when storing yoghurt, dispose less yoghurt.

The quality perception factors appear to be significant for some of the sensory perception cues and for the expiration date for the disposal of yoghurt. The sensory perception cues that influence the disposal of cheese are hardness, dryness and smell. Yoghurt disposal depends on the sensory cues of the sight of lumps and moulds on the package. Furthermore, the more respondents rely on the expiration date of yoghurt, the more yoghurt is disposed.

Finally, some additional variables influence food waste. The disposal of cheese and yoghurt is higher among younger people and larger households.

6. Critical reflection

The following chapter contains a critical reflection on the research. Several aspects of the research are critically reviewed; the research aim and questions, the research process and the researcher.

6.1 Research aim and questions

The research aim of this research is reached; this report provides insights into how the consumer's quality perception of dairy is formed. It must be stated that the initial research aim of the research is not reached, as this was to give recommendations for reducing food waste. It was difficult to develop a research method that could approach the aim of providing recommendations in a scientific way, thus the aim was adapted to a more fundamental aim. A critical comment can be made that the research does not cover the whole category of dairy, as the research aim suggests. It predominantly presents the formation of the consumer's quality perception of cheese and yoghurt.

The research questions of this research are all answered in this report, although it might not have been described explicitly. Nevertheless, the structure of the report is clear, and the outline of the report in the introducing chapter contains a description of where the answers of the specific research questions can be found.

6.2 Research process

The research process is critically reviewed on the following aspects: the usefulness of the selected literature, the use of the techno-managerial approach, the usefulness of the collected data and the adequacy of the research instruments.

First of all, the literature that was used for this research was useful on the aspects of relevancy and reliability. All the literature concerned studies on the problem of food waste, and were published in scientific journals. A critical statement can be made on the validity of the used literature, because it never concerned the food waste of specifically dairy. However, the sub research question that was answered by literature covered food waste in general and did not focus on the category of dairy.

Secondly, the use of the techno-managerial approach in this research has been well executed. The distinctions between the managerial and technological factors are clearly shown, and the approach is used as a basis for the formation of the theoretical framework. The difficult aspect in applying this approach for this research was that the topic of the research concerns the perception of the consumer. This is by definition subjective, and thus more of a managerial character. The influence of the technological factors on the product properties is not the main point of interest for this research; instead, it is the extent to which consumers use these factors in the formation of a quality perception. For example, the fact that a consumer stores yoghurt in the fridge is of less importance than that he does that because he has the impression that he slows down the yoghurt's spoilage rate. Nevertheless, the techno-managerial approach was still applied by indicating that the technical part of the consumer's perception is not purely based on these technological factors, but also on cues.

As a third aspect in reflecting on the research process, the usefulness of the collected data is discussed. The data collected by the interviews provided insights in the cues that consumers use when they judge the quality of cheese and yoghurt. The interviewees were not told that the topic of the research is food waste, thus the reliability of the data was not threatened. Furthermore, the interviews were all executed in a similar way. The validity of the interviews was ensured by the number of people that were interviewed; data collection was continued after no new information was revealed, hence saturation was achieved. The reliability of the data collected through the survey can be slightly questioned, since some of the respondents might have been aware of the topic of the research. These respondents might have given biased answers. The problem of reliability is expected to be only slightly present, since the proportion of people who have been told the topic of the research was low. The validity of the data collected through the survey is ensured by the literature review. The survey was developed based on the theoretical

framework, which, in turn, is based on literature. Therefore, the tested relationships are ensured on their validity. An aspect of the validity of the data collected through the survey that can be questioned is whether the respondents interpreted the questions in the way that they were expected to be interpreted. For example, it can be doubted whether people answered all the questions that concerned cheese for the type of cheese that they indicated to consume the most. Finally, the adequacy of the research instruments is discussed. The interviews were considered a suitable method for collecting the necessary data. The open-ended questions allowed the interviewees to provide unbiased answers on the aspects that they pay attention to in their quality perception of cheese and yoghurt. Furthermore, they have not been influenced by other people, as might have been a problem of a focus group. However, a critical point that could be made is that the respondents might not have come up with all the relevant aspect, just because they were not able to find this in their minds. This problem is solved by conducting a suitable number of interviews, ensuring that the data collection was saturated.

The survey was adequate in collecting data because the interviews provided input for developing the survey. Therefore, it was ensured that the questions that were asked were relevant for the topic. However, a survey does not allow for nuances, thus the respondents were forced to answer a question by indicating a specific answering option. This might have caused respondents to feel limited in indicating the real situation. This problem was solved by providing space for additional information, which allowed the respondents to clarify their answers. Furthermore, a survey as a research instrument might not have been adequate in measuring the dependent variables, i.e. the frequency and amount of food waste. Food waste is a sensitive topic, people can be aware of the fact that food waste is affecting the environment, thus do not feel comfortable in indicating their real behaviour concerning food waste. On top of that, people might underestimate their food waste behaviour. A more adequate research instrument for measuring food waste would be to weigh how much food is wasted, or let people keep track of their behaviour with a diary. Nevertheless, the results might still be biased due to socially desirable behaviour, and these methods are extremely time consuming.

6.3 Researcher

The influence of the researcher on the research has been limited, although it should be considered that a researcher has an inevitable influence on the research. In this research, the influence might have been particularly high in the formulation of the problem statement. The researcher's interests and background in consumer research might have caused the problem of food waste to be approached in a particular way. Rather than focussing on what causes a food to become deteriorated, this research focuses on what causes a consumer to perceive a food as deteriorated. The topic of food waste is approached in this way because there is a gap in literature on the formation of the consumer's quality perception in relation to food waste; however, the topic is also close to the researcher's interest. Another part of the research that might have been influenced by the researcher is the interviews. The presence of the researcher as interviewer inevitably influences the data that is collected. However, the influence has been minimized by using the interview guide, which ensured that the questions were not steering. Furthermore, the interviewer showed an open and neutral attitude towards the interviewees, allowing them to speak openly. The researcher has also influenced the interpretation of the results. A specific part in the report where this can be recognized is the discussion of the interview results. Although the interviews have been conducted in such a way that the reason for certain behaviour or using a certain cue is discovered, nevertheless, the researcher has an influence on deciding which aspect is relevant to food waste and which is not. In order to guarantee the objectiveness of the research, these results interpretations have been written in a discussion section, which allows an interpretive character. Furthermore, the discussion has been written in a transparent way, thus allowing the reader to follow the researcher's considerations.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.
- Aschemann-Witzel, J., de Hooge, I., Amani, P., Bech-Larsen, T., & Oostindjer, M. (2015). Consumer-Related Food Waste: Causes and Potential for Action. *Sustainability*, 7(6), 6457–6477.
- Bernstad Saraiva Schott, A., & Andersson, T. (2015). Food waste minimization from a life-cycle perspective. *Journal of Environmental Management*, 147, 219–226.
- Blichfeldt, B. S., Mikkelsen, M., & Gram, M. (2015). When it Stops Being Food. *Food, Culture & Society*.
- Block, L. G., Keller, P. A., Vallen, B., Williamson, S., Birau, M. M., Grinstein, A., ... Tangari, A. H. (2016). The Squander Sequence: Understanding Food Waste at Each Stage of the Consumer Decision-Making Process. *Journal of Public Policy & Marketing*, 35(2), 292–304.
- Bryngelsson, D., Wirsenius, S., Hedenus, F., & Sonesson, U. (2016). How can the EU climate targets be met? A combined analysis of technological and demand-side changes in food and agriculture. *Food Policy*, 59, 152–164.
- Cammelbeeck, T. (2013). *Rapport Voedselverspilling*.
- Consumption - definition of consumption by The Free Dictionary. (n.d.). Retrieved November 7, 2016, from <http://www.thefreedictionary.com/consumption>
- Darby, M. R., & Karni, E. (1973). Free Competition and the Optimal Amount of Fraud. *The Journal of Law & Economics*, 16(1), 67–88.
- Eberle, U., & Fels, J. (2016). Environmental impacts of German food consumption and food losses. *The International Journal of Life Cycle Assessment*, 21(5), 759–772.
- Edjabou, M. E., Petersen, C., Scheutz, C., & Astrup, T. F. (2015). Food waste from Danish households: Generation and composition. *Waste Management*, pp. 256–268.
- Evans, D. (2011). Blaming the consumer – once again: the social and material contexts of everyday food waste practices in some English households. *Critical Public Health*, 21(4), 429–440.
- Evans, D. (2012). Beyond the Throwaway Society: Ordinary Domestic Practice and a Sociological Approach to Household Food Waste. *Sociology*, 46(1), 41–56.
- FAO. (2013). Food wastage footprint: Impacts on natural resources. *Food and Agriculture Organization of the United Nations (FAO). Rome*.
- FAO. (2015). Global Initiative on Food loss and Waste Reduction. *Food and Agriculture Organization of the United Nations (FAO). Rome*.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics : and sex and drugs and rock'n'roll*. SAGE.
- Gibbons, J. H., Anderson, J., Braiman-Lipson, J., Burnette, M., Phillips, M. J., OTA Project Director, C., ... Morganstern, S. (1979). *Open Shelf-Life Dating of Food Advisory Panel*. Washington. D. C. : Office of Technology Assessment.
- Gruber, L. M., Brandstetter, C. P., Bos, U., Lindner, J. P., & Albrecht, S. (2016). LCA study of unconsumed food and the influence of consumer behavior. *International Journal of Life Cycle Assessment*.
- Grunert, K. G. (2002). Current issues in the understanding of consumer food choice. *Trends in Food Science & Technology*, 13(8), 275–285.
- Grunert, K. G. (2005). Food quality and safety: consumer perception and demand. *European Review of Agricultural Economics*, 32(3).
- Grunert, K. G., Bech-Larsen, T., & Bredahl, L. (2000). Three issues in consumer quality perception and acceptance of dairy products. *International Dairy Journal*, 10(8), 575–584.
- Johnson, M. (2003). Dairy Pipeline. *Dairy Pipeline: A Technical Resource for Dairy Manufacturers*, 15(2), 1–12.
- Jörissen, J., Priefer, C., & Bräutigam, K.-R. (2015). Food Waste Generation at Household Level: Results of a Survey among Employees of Two European Research Centers in Italy and Germany. *Sustainability*, 7(3), 2695–2715.

- Kähkönen, P., & Tuorila, H. (1999). Consumer responses to reduced and regular fat content in different products: effects of gender, involvement and health concern. *Food Quality and Preference*, 10(2), 83-91.
- Koivupuro, H.-K., Hartikainen, H., Silvennoinen, K., Katajajuuri, J.-M., Heikintalo, N., Reinikainen, A., & Jalkanen, L. (2012). Influence of socio-demographical, behavioural and attitudinal factors on the amount of avoidable food waste generated in Finnish households. *International Journal of Consumer Studies*, 36(2), 183-191.
- Luning, P. A., & Marcelis, W. J. (2009). *Food quality management*. The Netherlands: Wageningen Academic Publishers.
- Lyndhurst, B., Cox, J., & Downing, P. (2007). Retail Programme -Food Waste: Final Report. *Waste & Resources Action Programme (WRAP)*.
- Marklinder, I., & Eriksson, M. K. (2015). Best before date - food storage temperatures recorded by Swedish students. *British Food Journal*, 117(7), 1764-1776.
- Monier, V., Mudgal, S., Escalon, V., O'Connor, C., Gibon, T., Anderson, G., ... Morton, G. (2010). *Preparatory Study on Food Waste Across EU 27 - Report commissioned by the European Commission (DG ENV)*. October.
- Nemecek, T., Jungbluth, N., Milà Canals, L., & Schenck, R. (2016). Environmental impacts of food consumption and nutrition: where are we and what is next? *The International Journal of Life Cycle Assessment*, 21, 607-620.
- Olson, J. C., & Jacoby, J. (1972). Cue Utilization in the Quality Perception Process. *SV - Proceedings of the Third Annual Conference of the Association for Consumer Research*.
- Papargyropoulou, E., Wright, N., Lozano, R., Steinberger, J., Padfield, R., & Ujang, Z. (2016). Conceptual framework for the study of food waste generation and prevention in the hospitality sector. *Waste Management*, 49, 326-336.
- Peri, C. (2006). The universe of food quality. *Food Quality and Preference*, 17(1), 3-8.
- Priefer, C., Jörissen, J., & Bräutigam, K.-R. (2016). Food waste prevention in Europe – A cause-driven approach to identify the most relevant leverage points for action. *Resources, Conservation and Recycling*, 109, 155-165.
- Quested, T. E., Parry, A. D., Easteal, S., & Swannell, R. (2011). Food and drink waste from households in the UK. *Nutrition Bulletin*, 36(4), 460-467.
- Rathje, W. L., & Murphy, C. (2001). *Rubbish!: the archaeology of garbage*. University of Arizona Press.
- Reynolds, T. J., & Olson, J. C. (2001). *Understanding Consumer Decision Making: The Means-End Approach to Marketing and Advertising Strategy*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Röhr, A., Lüddecke, K., Drusch, S., Müller, M. J., & Alvensleben, R. v. (2005). Food quality and safety--consumer perception and public health concern. *Food Control*, 16(8), 649-655.
- Sepulveda, D. R., & Esparza-Chavez, A. (2016). Chapter 10 - Safety of Fermented Dairy Products. In *Regulating Safety of Traditional and Ethnic Foods* (pp. 187-204).
- Setti, M., Falasconi, L., Segrè, A., Cusano, I., & Vittuari, M. (2016). Italian consumers' income and food waste behavior. *British Food Journal* Iss *British Food Journal* *British Food Journal* *British Food Journal*, 118(7), 1731-1746.
- Stancu, V., Haugaard, P., & Lähteenmäki, L. (2016). Determinants of consumer food waste behaviour: Two routes to food waste. *Appetite*, 96, 7-17.
- Steenkamp, J. B. E. (1990). Conceptual model of the quality perception process. *Journal of Business research*, 21(4), 309-333.
- Stefan, V., van Herpen, E., Tudoran, A. A., & Lähteenmäki, L. (2013). Avoiding food waste by Romanian consumers: The importance of planning and shopping routines. *Food Quality and Preference*, 28(1), 375-381.
- Terpstra, M. J., Steenbekkers, L. P. A., Maertelaere, N. C. M. De, & Nijhuis, S. (2005). Food storage and disposal: consumer practices and knowledge. *British Food Journal*, 107(7), 526-533.
- Van Boxtael, S., Devlieghere, F., Berkvens, D., Vermeulen, A., & Uyttendaele, M. (2014). Understanding and attitude regarding the shelf life labels and dates on pre-packed food products by Belgian consumers. *Food Control*, 37, 85-92.

- Watson, M., & Meah, A. (2012). Food, waste and safety: negotiating conflicting social anxieties into the practices of domestic provisioning. *The Sociological Review*, 60(S2), 102–120.
- Williams, H., Wikström, F., Otterbring, T., Löfgren, M., & Gustafsson, A. (2012). Reasons for household food waste with special attention to packaging. *Journal of Cleaner Production*, 24, 141–148.
- WRAP. (2008). *The food we waste*. Banbury, UK.
- WRAP. (2009). Household Food and Drink Waste in the UK.
- Yeung, R. M. W., & Morris, J. (2001). Food safety risk. *British Food Journal*, 103(3), 170–187.

Appendix I

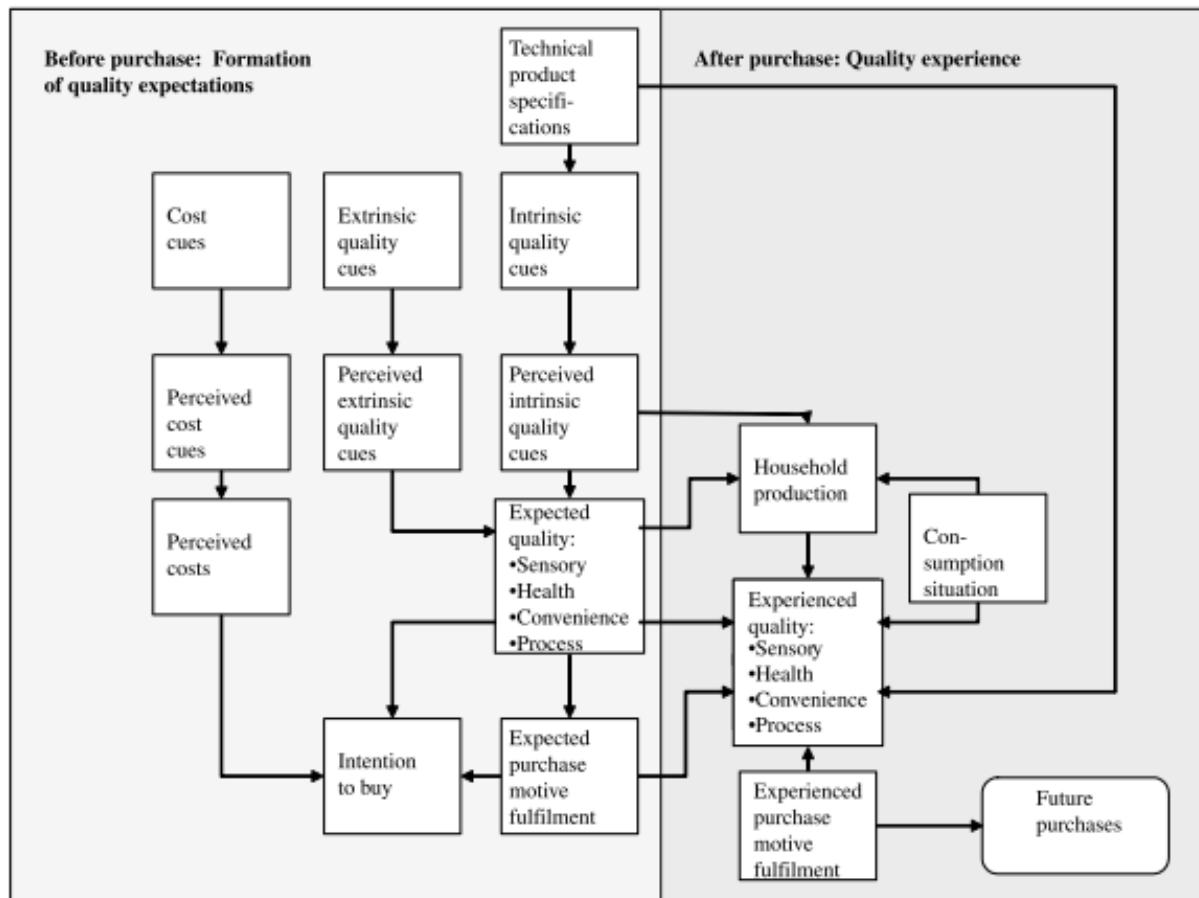


Figure 1: The Total Food Quality Model (from Grunert, 2005).

Appendix II

Interview guide (English)

Thank you for your participation in this research. The purpose of this interview is to investigate how people judge the quality of cheese and yoghurt. The interview will take approximately 30 minutes. Your answers will be handled confidentially; moreover, any answer is correct. Do you mind if the interview will be recorded?

Yoghurt

How often do you consume yoghurt?

What is the package size you usually buy?

Imagine that you are in the store, and that you want to buy yoghurt.

- What do you pay attention to?
- How do you judge the quality in the store?
- What else plays a role?

Imagine the moment directly after purchase.

- How do you handle the yoghurt?
- What do you pay attention to?
- What could influence the yoghurt's quality at that moment?

Imagine the moment after purchase, once you get home.

- How do you handle the yoghurt?
- What do you pay attention to?
- What could influence the yoghurt's quality at that moment?

Imagine the moment that you want to consume yoghurt.

- How do you handle the yoghurt?
- What do you pay attention to?
- What could influence the yoghurt's quality at that moment?

When do you decide not to consume yoghurt anymore?

- Why?
- What else plays a role?

Hand over the package of yoghurt:

- Would you consume this yoghurt? Why? Why not?
- What if the product's expiration date would have been {- two days later -}?
- What if the package would have been open? Why? Why not?

What could help you in determining the quality of yoghurt?

Cheese

How often do you consume cheese?

What is the package size you usually buy?

Imagine that you are in the store, and that you want to buy cheese.

- What do you pay attention to?
- How do you judge the quality in the store?
- What else plays a role?

Imagine the moment directly after purchase.

- How do you handle the cheese?
- What do you pay attention to?
- What could influence the cheese's quality at that moment?

Imagine the moment after purchase, once you get home.

- How do you handle the cheese?
- What do you pay attention to?

- What could influence the cheese's quality at that moment?

Imagine the moment that you want to consume cheese.

- How do you handle the cheese?
- What do you pay attention to?
- What could influence the cheese's quality at that moment?

When do you decide not to consume cheese anymore?

- Why?
- What else plays a role?

Hand over the package of cheese:

- Would you consume this cheese? Why? Why not?
- What if the product's expiration date would have been {- two days later -}?
- What if the package would have been open? Why? Why not?

What could help you in determining the quality of cheese?

Interview guide (Dutch)

Bedankt dat u mee wilt werken aan dit onderzoek. Het doel van dit interview is om inzicht te krijgen in hoe mensen de kwaliteit van kaas en yoghurt bepalen. Het interview zal ongeveer 30 minuten duren. Uw antwoorden zullen vertrouwelijk behandeld worden, en elk antwoord is goed. Vindt u het goed als het interview opgenomen wordt?

Yoghurt

Hoe vaak eet u yoghurt? Wat voor yoghurt?

Wat is de verpakkingsmaat die u meestal koopt?

Stel, u bent in de winkel en u wilt yoghurt kopen.

- Waar let u op?
- Hoe bepaalt u de kwaliteit van yoghurt in de winkel?
- Wat speelt er nog meer een rol?

Stel het moment na de aankoop voor, als u thuis komt.

- Hoe behandelt u de yoghurt?
- Waar let u op?
- Wat zou op dat moment de kwaliteit van yoghurt kunnen beïnvloeden?
 - Waarom?

Stel het moment waarop de yoghurt wilt consumeren voor.

- Hoe behandelt u de yoghurt?
- Waar let u op?
- Wat zou op dat moment de kwaliteit van yoghurt kunnen beïnvloeden?
 - Waarom?

Wanneer besluit u om yoghurt niet meer te consumeren?

- Waarom?
- Wat speelt er nog meer een rol?

Geef het pak yoghurt aan:

- Zou u deze yoghurt consumeren? Waarom? Waarom niet?
 - Welke informatie zou u kunnen helpen om te bepalen of u de yoghurt wilt consumeren?
- Wat als het de datum van vandaag had?
- Wat als de houdbaarheidsdatum {- twee dagen later -} was geweest?
- Wat als het pak open was geweest? Waarom? Waarom niet?

Wat zou u kunnen helpen in het beoordelen van de kwaliteit van yoghurt?

Melk

Hoe vaak consumeert u hollandse kaas? In welke vorm koopt u kaas?

Wat is de verpakkingsmaat die u meestal koopt?

Stel, u bent in de winkel en u wilt kaas kopen.

- Waar let u op?
- Hoe bepaalt u de kwaliteit van kaas in de winkel?
- Wat speelt er nog meer een rol?
 - Waarom?

Stel het moment na de aankoop voor, als u thuis komt.

- Hoe behandelt u de kaas?
- Waar let u op?
- Wat zou op dat moment de kwaliteit van kaas kunnen beïnvloeden?
 - Waarom?

Stel het moment waarop de kaas wilt consumeren voor.

- Hoe behandelt u de kaas?
- Waar let u op?
- Wat zou op dat moment de kwaliteit van kaas kunnen beïnvloeden?
 - Waarom?

Wanneer besluit u om kaas niet meer te consumeren?

- Waarom?
- Wat speelt er nog meer een rol?

Geef het pak kaas aan:

- Zou u deze kaas consumeren? Waarom? Waarom niet?
 - Welke informatie zou u nog meer kunnen gebruiken om dat te bepalen?
- Wat als de houdbaarheidsdatum de datum van vandaag was geweest?
- Wat als de houdbaarheidsdatum {- twee dagen later -} was geweest?
- Wat als het pak open was geweest? Waarom? Waarom niet?

Wat zou u kunnen helpen in het beoordelen van de kwaliteit van kaas?

Appendix III

Q1 Dear participant, I am conducting research on the how consumers treat Dutch cheese and yoghurt, as part of my master thesis for Food Quality Management at Wageningen University. Through this survey, your answers will be helpful in gaining insight in how consumers treat Dutch cheese and yoghurt. The survey should take approximately 15 minutes, and your responses are completely anonymous. I really appreciate your collaboration!

Please press ">>" in order to start the questionnaire.

Q2 What is your age?

Q3 What is your gender?

- ☐ Male
- ☐ Female

Q4 What is your highest level of completed or current education?

- ☐ Elementary education
- ☐ Secondary middle-level applied education
- ☐ Middle-level applied education (MBO)
- ☐ Secondary higher professional education
- ☐ Higher professional education
- ☐ Secondary scientific education
- ☐ Scientific education

Q5 What is your household size?

- ☐ Single-person household
- ☐ Two person household
- ☐ Three person household
- ☐ Four person household
- ☐ More than four person household

Q6 How concerned are you about the following issues?

	Extremely unconcerned	Unconcerned	A little unconcerned	Neutral	A little concerned	Concerned	Extremely concerned
6.1 Getting a lot of salt in my food.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.2 Getting a lot of fat in my food.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.3 Getting a lot of sugar in my food.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.4 Getting many calories.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.5 Getting sufficient energy from my food.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.6 Food additives in my food.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.7 Risk for high blood pressure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.8 Risk for coronary heart disease.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.9 Getting a lot of cholesterol in my food.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6.10 Gaining weight.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q7 How often do you consume Dutch cheese (sliced, piece or grated)?

- ☐ Daily
- ☐ Weekly
- ☐ Biweekly
- ☐ Monthly
- ☐ Half-yearly
- ☐ Less than half-yearly

Q8 In which situations do you consume Dutch cheese?

	Never	Once per month	Once per week	Several times a week	Daily
8.1 On a sandwich	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.2 With a drink	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.3 On the run	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.4 On a grilled sandwich	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.5 On a cracker or rusk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.6 With a warm meal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8.7 Through a salad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 Please answer the questions for the type of cheese that you buy the most frequent.
In which form do you buy Dutch cheese the most frequent?

- ☐ A piece of cheese
- ☐ Slices of cheese
- ☐ Grated cheese

Q10 Do you more frequently buy freshly cut or pre-packed cheese?

- ☐ Freshly cut cheese
- ☐ Pre-packed cheese

Q11 How is the Dutch cheese that you buy the most frequent packed?

- ☐ Cheese paper
- ☐ Clingfilm
- ☐ Plastic, vacuum packed
- ☐ Plastic, not vacuum packed

Q12 How old is the Dutch cheese that you buy the most frequent?

- ☐ Young
- ☐ Young mature
- ☐ Mature
- ☐ Extra mature
- ☐ Old
- ☐ More than one year old

Q13 What is the amount of fat of the cheese that you buy the most frequent?

- ☐ 10+
- ☐ 20+
- ☐ 30+
- ☐ 35+
- ☐ 48+
- ☐ 50+
- ☐ 60+
- ☐ Different, namely _____
- ☐ I don't know.

Q14 The Dutch cheese that you buy the most often is:

	1	2	3	4	5	6	7
14.1 Good for your health vs. Bad for your health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14.2 Distasteful vs. Tasty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q15 In the following questions there will be referred to the cheese's rind and crust. The picture indicates what is meant by these concepts.

The following statements concern the shopping of cheese. To what extent do you agree with the following statements?

	Completely disagree	Disagree	Disagree a little	Neutral	Agree a little	Agree	Completely agree
15.1 I pay attention to the weight of cheese.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If Can you answer the following questions about the type of Dutch cheese that you consume the most frequent?... Grated cheese Is Not Selected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.2 I pay attention to the shape of cheese.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.3 I buy more cheese when there is a special offer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.4 I buy cheese with reduced prices due to a soon to be reached expiration date.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.5 I pay attention to the expiration date of cheese.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.6 I pay attention to whether the cheese shows moulds.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If Can you answer the following questions about the type of Dutch cheese that you consume the most frequent?... Grated cheese Is Not Selected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.7 I pay attention to the size of the cheese's rind.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If Can you answer the following questions about the type of Dutch cheese that you consume the most frequent?... Grated cheese Is Not Selected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.8 I pay attention to the colour of the cheese's rind.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.9 I take the temperature outside into consideration when I buy cheese.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.10 I take my means of transportation to the store into consideration when I buy cheese.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15.11 I take the duration of transport from the store to my house into consideration when I buy cheese.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q16 The following statements concern the storage of cheese. To what extent do you agree with the following statements?

	Completely disagree	Disagree	Disagree a little	Neutral	Agree a little	Agree	Completely agree
16.1 I store cheese in the refrigerator.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.2 If yes: I pay attention to the location in the refrigerator for storing cheese.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If Do you more frequently buy freshly cut or pre-packed cheese? Pre-packed cheese Is Selected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.3 The opening of a package of cheese influences its rate of spoilage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.4 After opening a package of cheese, I try to finish it within a certain period of time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.5 I store cheese in something else than the original package.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.6 I pay attention to how I touch the cheese.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If In which form do you buy Dutch cheese?... A piece of cheese Is Selected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16.7 When I start a new piece of cheese, I immediately remove the cheese's crust completely.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q17 Space for explanation:

Q18 To what extent do you agree with the following statements?

	Completely disagree	Disagree	Disagree a little	Neutral	Agree a little	Agree	Completely agree
18.1 A piece of cheese is susceptible to spoilage after opening the package.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.2 Sliced cheese is susceptible to spoilage after opening the package.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.3 Grated cheese is susceptible to spoilage after opening the package.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.4 Consuming spoiled cheese can lead to food poisoning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18.5 Consuming spoiled cheese can lead to illnesses in the long term.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q19 Food poisoning after consuming spoiled cheese is ...

- ☐ Extremely uncomfortable
- ☐ Uncomfortable
- ☐ A little uncomfortable
- ☐ Neutral
- ☐ A little comfortable
- ☐ Comfortable
- ☐ Extremely comfortable

Q20 To what extent do you agree with following statements?

	Completely disagree	Disagree	Disagree a little	Neutral	Agree a little	Agree	Completely agree
<p>If Do you more frequently buy freshly cut or pre-packed cheese? Pre-packed cheese Is Selected</p> <p>20.1 When judging the quality of cheese, I consider the expiration date on the package.</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<p>If How is the cheese that you buy the most frequent packed? Cheese paper Is Not Selected</p> <p>20.2 When judging the quality of cheese, I consider the time that a product's package has been open.</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q21 How do you handle cheese if it has one of the following characteristics? *Alternative consumption refers to another way of consuming cheese than you would normally do. For example: if you normally consume cheese on a sandwich, you would perhaps grate the cheese for over a warm meal in one of the following situations.

				If you don't dispose the cheese completely, how do you consume the rest of the cheese?	
	Dispose completely	Dispose partly	Dispose not at all	Regular consumption	Alternative consumption*
21.1 The cheese shows signs of moulds.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.2 The colour of the cheese deviates.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.3 The smell of the cheese deviates.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.4 The rind of the cheese has a dark colour.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.5 The cheese is too hard to cut safely.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.6 The cheese is dried out.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.7 The shape of the cheese is bulged.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.8 The cheese is not tasty to consume on a sandwich.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.9 The cheese does not feel soft.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21.10 The cheese shows bursts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q22 Space for explanation:

Q23 I am interested in the consumption of neutral yoghurt. Neutral yoghurt refers to yoghurt without a flavour. Neutral yoghurt in my research also refers to non-flavoured yoghurt to which you add muesli, fruits, etc. If you consume neutral yoghurt in another way, it also refers to neutral yoghurt.

How often do you eat neutral yoghurt?

- ☐ Daily
- ☐ Weekly
- ☐ Biweekly
- ☐ Monthly
- ☐ Half-yearly
- ☐ Less than half-yearly

Q24 In which situations do you consume neutral yoghurt?

	Never	Once per month	Several times per month	Once per week	Several times per week	Daily
24.1 During breakfast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24.2 During lunch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24.3 During dinner (excluding dessert)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24.4 As a snack	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24.5 As a dessert	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q25 What type of neutral yoghurt do you consume the most frequent?

- ☐ Regular Dutch yoghurt
- ☐ Greek yoghurt
- ☐ Yoghurt Greek style
- ☐ Turkish yoghurt
- ☐ Soy yoghurt
- ☐ Different, namely _____

Q26 What is the fat content of the yoghurt that you consume the most frequent?

- ☐ Low fat yoghurt
- ☐ Medium fat yoghurt
- ☐ Full fat yoghurt
- ☐ I don't know

Q27 How is the yoghurt that you consume the most frequent packed?

- ☐ A pack
- ☐ A cup
- ☐ A bucket
- ☐ A serving tub
- ☐ A bottle

Q28 The neutral yoghurt that you consume the most frequent is:

	1	2	3	4	5	6	7
28.1 Bad for your health vs. Good for your health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28.2 Distasteful vs. Tasty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q29 The following statements concern the shopping of neutral yoghurt. To what extent do you agree with the following statements?

	Completely disagree	Disagree	Disagree a little	Neutral	Agree a little	Agree	Completely agree
29.1 I buy more yoghurt when there is a special offer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29.2 I buy yoghurt with reduced prices due to a soon to be reached expiration date.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29.3 I pay attention to the expiration date of yoghurt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29.4 I pay attention to the amount of yoghurt that I buy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29.5 I only buy yoghurt in a not damaged package.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If How is the yoghurt that you consume the most frequent packed? A pack Is Selected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29.6 I prefer to buy yoghurt in pack with a twistable cap.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29.7 I pay attention to my impression of the package's temperature.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29.8 I take the temperature outside into consideration when I buy yoghurt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29.9 I take my means of transportation to the store into consideration when I buy yoghurt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29.10 I take the duration of transport from the store to my house into consideration when I buy yoghurt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q30 The following statements concern the storage and consumption of yoghurt. To what extent do you agree with the following statements?

	Completely disagree	Disagree	Disagree a little	Neutral	Agree a little	Agree	Completely agree
30.1 I store yoghurt in the refrigerator.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30.2 I pay attention to the location in the refrigerator for storing yoghurt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30.3 Opening the package increases the process of spoilage of yoghurt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30.4 I shake the package of yoghurt before consuming it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If How is the yoghurt that you consume the most frequent packed? A pack Is Not Selected And How is the yoghurt that you consume the most frequent packed? A bottle. Is Not Selected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30.5 I stir the yoghurt before consuming it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If How is the yoghurt that you consume the most frequent packed? A serving tub Is Not Selected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30.6 After opening the package, I try to finish yoghurt within a week.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q31 To what extent do you agree with the following statements?

	Completely disagree	Disagree	Disagree a little	Neutral	Agree a little	Agree	Completely agree
31.1 Neutral yoghurt is susceptible to spoilage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31.2 Consuming spoiled yoghurt can lead to food poisoning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31.3 Consuming spoiled yoghurt can lead to illnesses in the long term.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Condition: Consuming spoiled yoghurt can lead to... Is Selected. Skip To: Q33 To what extent do you agree with the following statements?

Q32 A food poisoning after consuming spoiled yoghurt is:

- ☐ Extremely uncomfortable
- ☐ Uncomfortable
- ☐ A little uncomfortable
- ☐ Neutral
- ☐ A little comfortable
- ☐ Comfortable
- ☐ Extremely comfortable

Q33 To what extent do you agree with the following statements?

	Completely disagree	Disagree	Disagree a little	Neutral	Agree a little	Agree	Completely agree
33.1 When judging the quality of yoghurt, I consider the expiration date of the package.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33.2 When judging the quality of yoghurt, I consider the time that a product's package has been open.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q34 Would you dispose yoghurt in case of the following situations? I would dispose yoghurt if ...

	Completely disagree	Disagree	Disagree a little	Neutral	Agree a little	Agree	Completely agree
34.1 ... its package is dirty.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If How is the yoghurt that you consume the most frequent packed? A pack Is Selected And How is the yoghurt that you consume the most frequent packed? A cup Is Selected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.2 ... its package is swollen.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.3 ... its package has leaked.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If How is the yoghurt that you consume the most frequent packed? A pack Is Selected	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.4 ... its twistable cap has leaked.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.5 ... its package shows moulds.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.6 ... there is a liquid layer on top of the yoghurt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.7 ... the yoghurt shows moulds.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.8 ... the colour of yoghurt deviates.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.9 ... there are lumps in the yoghurt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.10 ... the smell of the yoghurt deviates.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.11 ... the taste of the yoghurt deviates.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34.12 ... its expiration date has passed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q35 How often do you dispose (a part of) cheese? There is not referred to the disposal of the crust of cheese.

- ☐ Daily
- ☐ Weekly
- ☐ Biweekly
- ☐ Monthly
- ☐ Half-yearly
- ☐ Yearly
- ☐ Less than yearly

Q36 How much cheese do you dispose per time that you dispose cheese? There is not referred to the disposal of the crust of cheese.

	1	2	3	4	5	6	7
Little vs. Much	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q37 How often do you dispose yoghurt?

- ☐ Daily
- ☐ Weekly
- ☐ Biweekly
- ☐ Monthly
- ☐ Half-yearly
- ☐ Yearly
- ☐ Less than yearly

Q38 How much yoghurt do you dispose per time that you dispose yoghurt?

	1	2	3	4	5	6	7
Little vs. Much	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q39 To what extent do you agree with the following statements?

	Completely disagree	Disagree	Disagree a little	Neutral	Agree a little	Agree	Completely agree
39.1 I try not to throw food away.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39.2 I intend not to throw food away.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39.3 My goal is to not throw food away.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q40 What do you think of the following statements?

	1	2	3	4	5	6	7
40.1 Wasting food is Avoidable vs. Unavoidable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40.2 Not to throw food away is Easy vs. Difficult	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40.3 Loading the environment with my food waste is Avoidable vs. Unavoidable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q41: Thinking about the activities related to food within your home, how would you rate your household's skills, in terms of

	Extremely bad	Bad	Quite bad	Not good, not bad	Quite good	Good	Extremely good
41.1 Planning the meals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41.2 Buying the right food in right amounts to prepare meals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41.3 Planning the shopping.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41.4 Cooking / preparing the food.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q42 How often do the following situations occur?

	Never	Almost never	Sometimes	Regularly	Often	Almost always	Always
42.1 How frequently do you make a list of the food you want to buy prior to your shopping trip?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42.2 How frequently do you check your food inventories prior to your shopping trip?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42.3 How often do you plan your meals, in advance, for several days ahead?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42.4 How frequently do you have an excess of food prepared?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42.5 How frequently do you prepare food that tastes bad or lacks flavour?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q43 To what extent do you agree with the following statement?

	Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
I have an aversion to risk insufficient amounts of prepared food.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q44 Are you interested in the results of this research? You can fill in your email address here. I will send you an email as soon as I have the results.

Q45 By pressing ">>" the survey will be finished and submitted.

Appendix IV

Table 17: Mean and standard deviation of the survey respondents' age.

	Mean	Standard deviation
Age	46.35	16.454

Table 18: Frequencies and percentages of the survey respondents' gender.

Gender	Frequency	Percent
Male	47	27.5
Female	124	72.5
Total	171	100.0

Table 19: Frequencies and percentages of the survey respondents' levels of education.

Level of education	Frequency	Percent
Elementary education	0	0.0
Secondary middle-level applied education (VMBO / MAVO)	6	3.5
Middle-level applied education (MBO)	27	15.7
Secondary higher professional education (HAVO)	16	9.3
Higher professional (HBO)	64	37.2
Secondary scientific education (VWO)	6	3.5
Scientific education (WO)	53	30.8
Total	172	100.0

Table 20: Frequencies and percentages of the survey respondents' household sizes

Household size	Frequency	Percent
Single-person household	30	17.4
Two person household	68	39.5
Three person household	22	12.8
Four person household	37	21.5
More than four person household	15	8.7
Total	172	100.0

Appendix V

Table 21: Frequencies and percentages of the survey respondents' cheese consumption.

Cheese consumption	Frequency	Percent
Daily	96	56.8
Weekly	52	30.8
Biweekly	14	8.3
Monthly	3	1.8
Half yearly	0	0.0
Less than half yearly	4	2.4
Total	169	100.0

Table 22: Cross tabulation of the survey respondents' most frequently bought form of cheese versus the most frequently bought type of cheese in terms of freshly cut or pre-packed cheese.

	Freshly cut	Pre-packed	Total
A piece of cheese	49	57	106 (64.6%)
Sliced cheese	9	35	44 (26.8%)
Grated cheese	1	13	14 (8.5%)
Total	59 (36.0%)	105 (64.0%)	164 (100%)

Table 23: Frequencies and percentages of the survey respondents' most frequently bought cheese in terms of duration of ageing.

Duration of ageing	Frequency	Percent
Young	15	9.1
Young mature	60	36.6
Mature	53	32.3
Extra mature	24	14.6
Old	12	7.3
Total	164	100.0

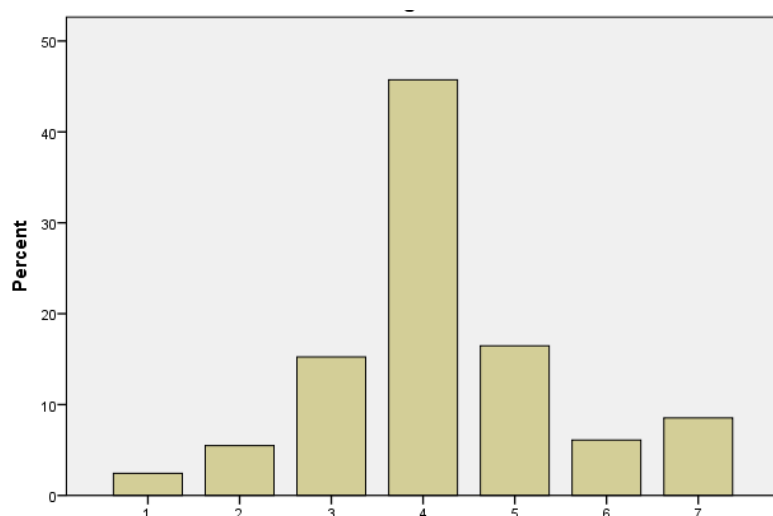


Figure 5: Bar chart of the survey respondent's belief on the healthiness of the cheese that they buy the most frequent; 1 referring to bad for their health, 7 referring to good for their health.

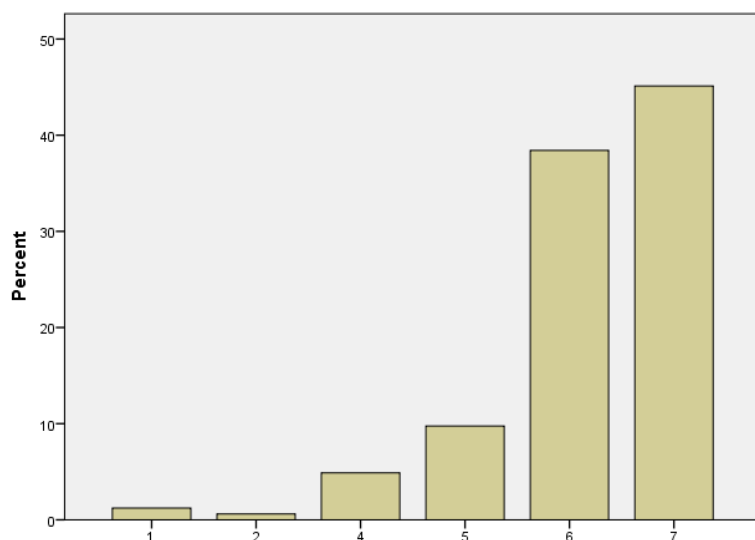


Figure 6: Bar chart of the survey respondent's belief on the tastiness of the cheese that they buy the most frequent; 1 referring to distasteful , 7 referring to tasty.

Table 24: Frequencies and percentages of the survey respondents' yoghurt consumption.

Yoghurt consumption	Frequency	Percent
Daily	59	38.6
Weekly	33	21.6
Biweekly	10	6.5
Monthly	15	9.8
Half yearly	14	9.2
Less than half yearly	22	14.4
Total	153	100.0

Table 25: Frequencies and percentages of the survey respondents' most frequent consumed type of yoghurt.

Yoghurt type	Frequency	Percent
Regular Dutch yoghurt	75	64.7
Greek yoghurt	16	13.8
Yoghurt Greek style	6	5.2
Turkish yoghurt	5	4.3
Soy yoghurt	1	.9
Different, namely	13	11.2
Total	116	100.0

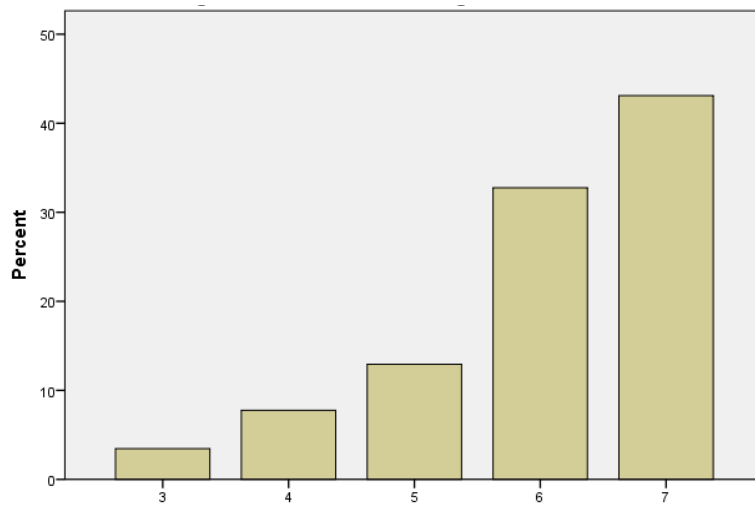


Figure 7: Bar chart of the survey respondent's belief on the healthiness of the yoghurt that they consume the most frequent; 1 referring to bad for their health, 7 referring to good for their health.

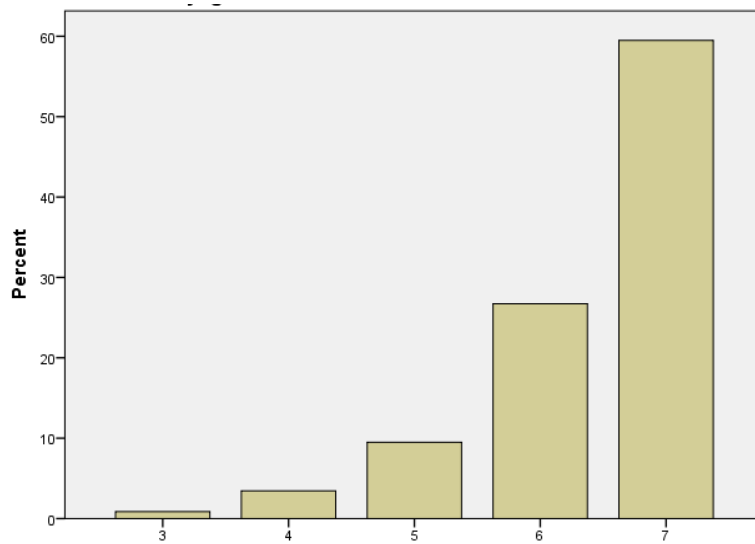


Figure 8: Bar chart of the survey respondent's belief on the tastiness of the yoghurt that they consume the most frequent; 1 referring to distasteful, 7 referring to tasty.

Appendix VI

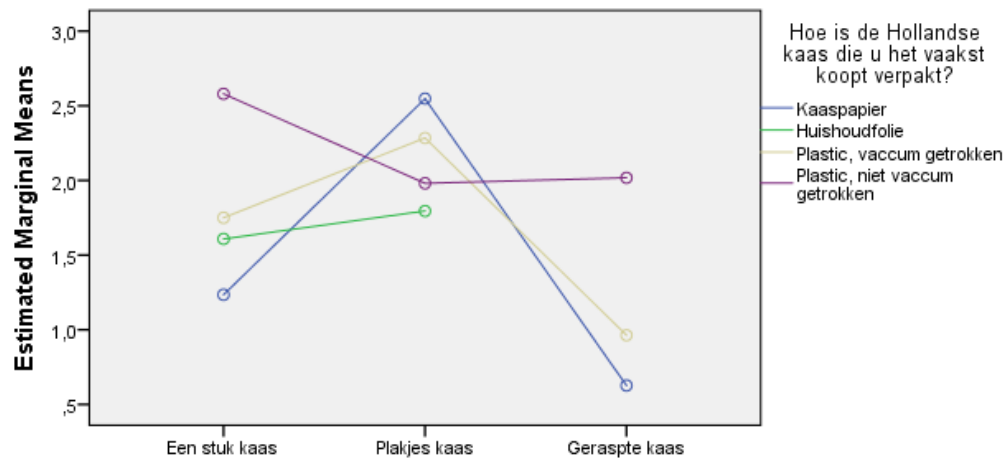


Figure 9: Profile plot for the amount of cheese disposed concerning the form and package in which it is bought.

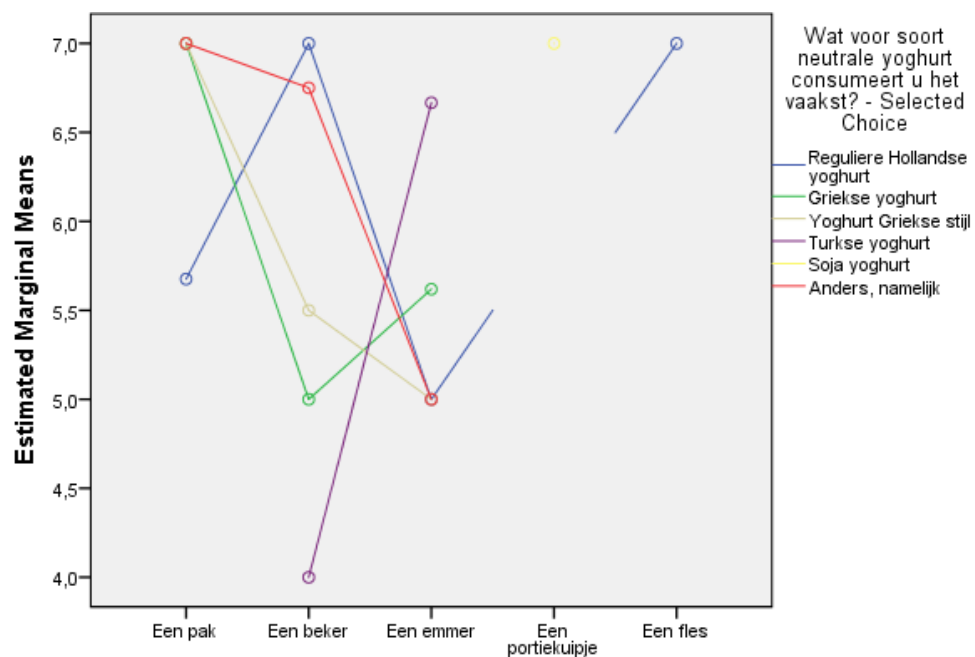


Figure 10: Profile plot for the frequency of yoghurt disposal displayed for the type of package in which the most frequent consumed yoghurt is bought and type of yoghurt that is most frequent bought.