A market research on non-sticking carton packaging material for yoghurt based products for Tetra Pak

IVI S. KALYVIOTI

MASTER´S THESIS

Packaging Logistics
Lund University

This Master's thesis has been done within the Erasmus Mundus Master Course FIPDes, Food Innovation and Product Design.

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FIPDes has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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Published by

Division of Packaging Logistics
Department of Design Sciences
Faculty of Engineering, Lund University
P.O. Box 118, SE-221 00 Lund, Sweden

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www.fipdes.eu

ISRN LUTMDN/TMFL-13/5109-SE
ISBN 978-91-7473-582-6

Abstract

It is estimated that approximately 8-10% of yogurt-based products stick to the carton packaging material surface (Hansson, 2011), and therefore consumers cannot pour the entire product out of the package. This is a multi-dimensional problem since product loss is expensive, because all the resources throughout the supply chain are wasted (European Parliament, 2011; FAO, 2012). In addition, the remaining product in the carton package makes it harder to recycle the material. Finally, the development of a packaging material that helps towards the reduction of food waste would help sustain the world's limited resources.

This exploratory study is aiming in understanding the market for a carton packaging material that prevents food waste in order to align the material development strategy of Tetra Pak. Experts from key food companies in the dairy industry in the Nordics and in the Netherlands, as well as influencers on the topic were interviewed. Furthermore, a consumer survey in Sweden and in the Netherlands was conducted.

The results showed that packaging has a secondary role in the decision making process for the consumers at the point-of-purchase. Consumers are basing their choices mainly on the product they are buying. However, packaging has a crucial role while the product is being used at home. Consumers appear more observant when it comes to packaging attributes. It is critical for consumer's convenience especially when it comes to the use and storage of the product. Furthermore, although consumers do recognise food waste as a problem and they are interested in environmental claims, their first priorities are convenience and price. Retailers are also working in the food waste issue and as a result they are putting pressure backwards in the supply chain for packaging developments.

Executive Summary

Large quantities of the food production are wasted throughout the supply chain, from the agricultural production down to the household consumption (Gustavsson et al., 2011). In Europe, food waste reaches up to 50% of the production considering the losses throughout the supply chain from the field up to the consumer level. Reports show that 60% of the losses at the consumer level could be avoided (European Parliament, 2011).

Packaging's Role in Food Waste

Packaging plays an important role in this problem. A household survey in Sweden in 2009-2010 showed that 20-25% of the wasted food in households could be related to packaging, while dairy products reach up to 9,5% of the total amount of wasted food in households, out of which ¾ is yogurt and sour milk. Packaging attributes to food waste can mainly be related to the packaging design. The size, sealing, way of storing, light weighing and the difficult to empty are packaging functions that can result in food waste. In addition to these, date labelling and more specifically the "use by" and "best before" dates play also an important role (Williams et al., 2012). However, one of the most crucial factors are consumers themselves. Consumer behaviour is highly important in the route for minimizing food waste, but packaging can provide the information or the technology in order to guide the consumer.

As a result, there have appeared opportunities for the packaging industry to develop packages that help towards the reduction of food waste. Tetra Pak and Arla launched in early 2013 a solution for the difficulty to empty the packages, with a package designed to have a separable top that the consumer can remove with a perforation and squeeze the product out of the package (Tetra Pak, 2013). Furthermore, Ecolean is marketing a pitcher-shaped pouch made of a flexible material that apart from being light weighted, it is claimed that allows the consumer to remove almost 100% of the product inside (Ecolean, 2013).

Goal and Purpose of the research

The goal of this research is to understand the market for a carton packaging material that prevents food waste in order to align the material development strategy of Tetra Pak. More specifically, we are aiming at identifying the characteristics of this market in terms of consumer's value, awareness, demands and future trends, as well as to understand how the companies can help the consumers to evaluate their purchases, not only considering the product they are buying, but also the packaging at the point-of-purchase. Nevertheless, our research is limited to yogurt based products with high viscosity and the only packaging attribute that is researched is the difficulty to empty.

Methodology

For the purpose of this study we used a triangulation methodology combining both qualitative and quantitative methods. It included (a) a review on related publications on food waste and packaging, especially regarding the difficulty to empty aspect, (b) interviews with food manufacturers and influencers/experts on the matter and (c) a survey on consumers in Sweden and in the Netherlands, including both face-to-face and online questionnaires. Regarding the chosen interviewees, they were mainly selected because of their expertise in the field (both for influencers and companies) and their activities in the investigated markets (Table 1). Three key players in the dairy industry that hold a large share of the markets in Norway, Finland, Denmark and the Netherlands where chosen to represent Tetra Pak's customers. At the same time, three influencers from movements against food waste, and experts from organizations and the academia were interviewed. As for the consumer survey, we randomly chose them depending on their willingness to participate in this study.

The interview and the survey had the same content. The main topics that we investigated during the study were: (a) the market for yogurt-based products, (b) the consumer's satisfaction regarding the packaging design, (c) the consumer's behavior at the point-of-purchase and the retailer's role, (d) the relation between consumers and environmental claims and logos and finally (e) the pricing of environmental friendly packages and more specifically packages that are easy-to-empty.

Results & Discussion

Interviews

According to the respondents yogurt-based products are targeting the whole family. They are mainly used as breakfast, snacks or between meals. When it comes to packaging, 1L gable top packages represent the most common packages for spoonable yogurt in most of the investigated markets apart from Norway where this kind of package was not as successful as cups and the industry is on its way of replacing them with gable tops.

An interesting example of consumer's behavior contribution to the food waste problem that resulted from the interviews was the case of the "screw cap". Screw caps were implemented in gable top packages after consumer demand in order to facilitate sealing, storage, convenience in use and appearance of the product while used and stored. However, consumer's started eating the product directly from the packaging resulting in its contamination. In some cases, consumers were complaining that the product was spoiled before its expiry date. In addition, with the implementation of the screw cap, consumers are no longer opening the package to remove the leftover product out, since the screw cap gave them the "feeling" of an easier to empty package. At the same time, there were some environmentally concerned consumers that complained about the presence of two different packaging materials (paperboard and plastic) that made it harder to recycle the package.

When it comes to environmental claims, we focused the interviews on the way these claims affect the decision process of the consumers at the point-of-purchase and the consumer's trust in claims coming from private companies. The interviewees claimed that they do not have a significant impact on consumers, but their absence can be considered as a disadvantage. In addition, they claimed that consumers don't have time to read the package while buying their products.

We also focused the discussion on environmental logos and the possibility of establishing a logo for food waste reduction. The interviewees appeared to be negative towards that development since there are already too many logos on packages and the consumer's understanding appears to be low (Ipsos Mori, 2008). At the same time, they believe that it would be hard to develop and certify such a comment. On the contrary, the experts believe that there could be a logo, certifying good practice against food waste taking into consideration the whole supply chain.

Finally, we discussed the role of the retailers in the food waste issue. Some of the respondents claimed that retailers do request developments towards the reduction of food waste, such as packages that prolong shelf life. At the same time, they are working with campaigns against food waste and this might appear as an opportunity for the launching of an easy-to-empty packaging solution applied in different kind of food products including yogurt-based products and custards.

Consumer survey

When consumers were asked how do they usually dispose the packaging of yogurt-based products the majority (38,3%) of the respondents in Sweden said that they usually cut, open and try to empty completely the packaging while the second most popular answer was that they squeeze the product out of the package. This points out the fact that they do realize there is an amount of the product left inside and they are making an effort to take it out. There was also a big part of the respondents (26%) that said they are just throwing away the package in the recycling after rinsing it. For this group, it is not clear whether they identify the food waste issue or not. There is the probability that they do identify it, but they don't have the time or they don't want to make the effort to take the product out, because they believe it is not a lot.

Furthermore, around 58,3% of the consumers in Sweden and 56% in the Netherlands claimed that the estimated amount of yogurt based product thrown away with the packaging, reaches up to 5% of the total product. However, research studies shows that this amount is at least 8-10% of the product in the packaging (Hansson, 2011).

In addition, around 62% of the consumers agreed that discarded food packaging is a greater environmental issue than food thrown away. Although the figures appeared improved compared to the results form similar surveys from WRAP in 2007, consumers still need to be informed. For instance, Wikström and Williams developed a life cycle assessment (LCA) model in 2010 that analyses packaging solutions with the purpose of minimizing the environmental impact of the food packaging system. Their results showed that the environmental impact of packaging can be allowed to increase if the new packaging design reduces food losses (Wikström & Williams, 2010).

Finally, 43,3% and 29,3% of the consumers in Sweden and in the Netherlands respectively, appeared to be prepared to pay more for a packaging that helps reduce food waste due to its non-sticking properties.

Concluding remarks

The main incentives for consumers when taking packaging design into consideration are convenience and money saving. This means that companies should also focus their development strategies on that area. When it comes to the carton packaging material that was researched in this study, experts believe if it is launched there will appear a "domino effect" and consumers are going to request its implementation not only in yogurt-based products but other high viscous products as well. This also means that the company that is first going to launch this will have a competitive advantage compared to the other food and packaging companies.

Acknowledgments

I would like to express my sincere thanks to my supervisors from Tetra Pak Marlene Kjellstrand and Erik Steijger for all their support and valuable feedback through this interesting project. I would also like to thank my supervisor from Lund University Katrin Molina-Besch both for guiding me in the design of my research and supervising me during these months, but also for her valuable comments when reviewing this report.

In addition, I would like to express my gratitude to all the respondents that participated in this study for dedicating their attention and time to this research.

I consider myself very lucky to have had such an experience during this Master's program in FIPDes. I would like to thank all my classmates in the program for such an adventurous and amazing journey we had together. This would have never been the same without you and I would not change it for anything. Thank you for all of our talks, thank you for everything that we shared, thank you for showing me the world through your eyes and thank you for our friendships which I will always keep in my heart and value as the most important thing I gained the last two years.

Last but not least, I would like to thank my family. Their endless support and faith in me are the most important gifts anyone has ever given to me. You are always there for me, helping me pursue even my craziest dreams, thinking of me, worrying about me and being proud of me no matter what.

June 2013, Lund

Ivi Kalyvioti

To Andriana & Thodoris

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Chapter I Introduction

1.1 Project background

1.1.1 The food waste problem

Large quantities of the food production are wasted throughout the supply chain, from the agricultural production down to the household consumption. In industrialized countries, it is estimated that 40% of this food waste occurs at the retail and the consumer level (Gustavsson et al., 2011).

Food production though requires natural resources and large amounts of energy consumption, both for its production and distribution. Thus, food waste causes unnecessary environmental impact, not only because of the energy and resources waste, but also because unconsumed food contributes significantly to the Greenhouse Gas Effect. More specifically, food represents the greatest environmental impact in terms of CO_2 emissions, energy and water usage, transport kilometres and waste processing, after housing and transport, with the figures reaching 20-30% worldwide (Ministry of Agriculture, Nature and Food Quality, 2010). Apart from that, it is expected that by 2050 the human population is going to reach nine billion, leveling the demand for food supplies up to 70% higher than today and revealing also an ethical problem of food wastage.

In Europe, edible food is lost throughout the whole supply chain and some studies show that the level of waste reaches up to 50% of the production, considering the losses from the production up to the consumer level. In addition, it is estimated that 60% of the losses that occur in the post-consumer level could be avoided. In response to these studies the European Parliament, apart from other initiatives, has published a report on how to avoid food wastage, calling the European Commission, the Member Stated and all the involved actors to take measurements so as to cut down on unnecessary food waste (European Parliament, 2011).

Food waste is generated as a result of different parameters across the supply chain, depending also on the income level of the market. In low-income countries, food waste appears mostly in the early stages of the supply chain, due to managerial and technical limitations from the harvesting techniques to the packaging and marketing systems. On the other hand, in medium and high-income countries the

causes for food losses mainly relate to consumer purchasing and food use practices (FAO, 2012).

1.1.2 Role of packaging in food waste problem

Packaging's main role is to protect the food from physical damage and biological deterioration and to facilitate distribution. In addition, it also provides information on the product (content, best-before-date, etc.) and supports marketing.

Nevertheless, packaging has also been related to food waste. Williams et al. conducted an exploratory study in 2009-2010 in Sweden in order to identify reasons for household food waste and especially waste related to packaging. The results showed that 20-25% of the wasted food could be related to packaging. More specifically, consumers, who were environmentally educated, claimed that 16% of the wasted food resulted because of the packaging. One of the main reasons that was identified by the consumers is that it was very difficult to empty the packaging, with the amount of wasted dairy products reaching 9,5% of the total amount of wasted food, out of which about ¾ is yoghurt and sour milk from liquid packaging board. Other factors of food waste that can be related to packaging appear to be too large packages, too little packaging protection and the difficulty to reseal or store properly (Williams et al., 2012).

1.1.3 Possibilities to solve the problem with "easy-to-empty" packaging solutions

The difficulty to empty the packaging appears as one of the most disliked properties of packaging (Williams et al., 2012). As a result, food and food packaging manufacturers have started taking initiatives towards that direction, launching products in order to help the consumer remove the majority of the food product from its packaging.

One characteristic example is Ecolean that launched a flexible stand-up, pitcher-shaped pouch, designed to suit various purposes. It is claimed that due to the soft material, the consumer can practically squeeze out of the package 100% of the

Figure 1: Pitcher shaped packaging from Ecolean (on the left) and Tetra Top from Tetra Pak for Yoggi (on the right).

product (Ecolean, 2013). At the same time, Arla launched its Yoggi in collaboration with Tetra Pak in February using Tetra Top. The packaging has a separable top and the consumer can use a perforation to remove the top of the packaging and squeeze the product out of the package. 88% of the consumers agreed that they could take more product out of the package (Tetra Pak, 2013).

In addition, there have been studies towards the development of new materials for packaging that have non-sticking characteristics. One of the most successful ones appears to be "LiquiGlide" which is a coating material that can be used for application, starting from the food packaging industry to oil & gas industry (Liquiglide, 2013).

1.1.4 Tetra Pak

Tetra Pak's target is to develop breakthrough, innovative food packaging and processing solutions. A new package that would facilitate the food waste prevention would be of great importance, since it would be a key component both for Tetra Pak and its customers in order to improve their environmental profile.

The company was founded by Ruben Rausing in 1951 in Lund, Sweden. Tetra Pak introduced a paper based package with a characteristic tetrahedron-shape to package and store dairy products. Several more different packages were developed after that one, but the breakthrough for Tetra Pak came in 1959, when their first aseptic packaging was launched. This package enabled the preservation of milk for more than one week without the need of refrigeration.

Today Tetra Pak is one of the three companies that form the Tetra Laval group. The company is selling hundreds of different packaging solutions as well as processing solutions for food in more than 170 countries in the world. 173 billion packages were sold in 2012 reaching a total of net sales 11,2 billion €.

Figure 2: Today's portfolio of Tetra Pak packages.

There is an increased awareness on the importance of reducing food waste. For Tetra Pak there are opportunities to develop new packaging material that can help facilitating the reduction of food waste. However, this new material often has a higher complexity and thus is more costly to produce. It is important for Tetra Pak to understand the potential market, future trends in consumer lifestyle and purchase behaviour in order to invest the development resources in the right way.

1.2 Problem discussion

Although the development of packaging materials with non-sticking properties appears as a promising project, the potential market for this type of product has not been identified yet. Results from surveys illustrate that consumers are still not that informed on the environmental impact of food waste. In UK, 60% of the respondents of such a survey, agreed that "Food waste is not an issue since it is natural and biodegradable" and at the same time almost 92% perceive food packaging waste as a greater environmental issue than food waste (WRAP, 2007). On the other hand, the past years, many influencers have appeared in this area, working towards the increase of consumer's awareness in the food waste issue. Consequently, it is evident that there is a need of further investigation on the potential market for a packaging material preventing food waste.

1.3 Goal and purpose

This master thesis should help align the material development strategy with an understanding of the market for a packaging that prevents food waste. More specifically, the goal of the research is to identify the characteristics of this market in terms of consumer's value, awareness, demands and future trends. The results of this project will also give an understanding on what does a brand-owner have to communicate to consumers about packaging that prevents food waste in order to help them evaluate their purchases, not only considering the product they are buying, but also the packaging at the point-of-purchase. For this reason, this master thesis will investigate the market conditions for a paper based packaging with non-sticking properties for yoghurt-based products.

1.4 Delimitations

To begin with the project took place in a limited period of twenty weeks which forced the focus on certain aspects related to food waste generation and the role of packaging to that. The research was limited on paper-based packaging material for yogurt-based products. Other types of materials for packaging were excluded from this study as well as different high viscous products such as custards, soups or shakes.

Apart from that, the consumer survey that was conducted included consumers from Sweden and the Netherlands. The countries that appear to be more aware of the food waste issue are UK, Denmark, Finland, Norway, Sweden and the Netherlands. Since it is was not possible to gather data globally or from all these countries under the limitations of this master thesis, Sweden and the Netherlands were chosen for this survey. Moreover, the respondents that were chosen for the interviews were not just

from the countries where the consumer survey was conducted. Their selection was mainly after consultation with our supervisors with Tetra Pak and their willingness to participate in this study.

Furthermore, for the purpose of this study, we only considered the difficulty to empty as a packaging attribute towards food waste. Other, attributes such as reseal-ability, date labeling (best before/use by dates), size, etc. were not considered for this research.

In addition, high viscous products that cause food waste are dairy products such as yogurts, fermented milk, but also custards, soups. In this study we are only focusing on yogurt based products with high viscosity.

Regarding the interviews, it should be taken into consideration that they were all conducted in English. As both the interviewer and most of the respondents are not native English speakers, the ability to communicate was potentially limited.

Chapter II Literature Review

2.1 Food waste

2.1.1 Definition of food waste

Food waste occurring early in the supply chain, taking part at production, post-harvest and processing stages is defined as "losses", while discarded food products at the retail or consumers stage are called "waste" (Gustavsson et al., 2011). Moreover, in 2008 WRAP defined food waste as follows:

Avoidable food waste – the food has been thrown away because it is no longer wanted or has been allowed to go past its best.

Possibly avoidable food waste – This is food that some people will eat and others will not, or that can be eaten when prepared in one way but not in another (examples include bread crusts and potato skins)

Unavoidable food waste – This waste arises from food preparation and includes foods such as meat bones and hard vegetable or fruit peelings; it also includes tea bags and coffee grinds.

2.2 Role of packaging in food waste

2.2.1 Packaging definition

The principal role of food packaging is to protect food products from outside influence and damage, to contain the food and to provide consumers with ingredients and nutritional information. Apart from that, traceability and convenience are secondary functions of increasing importance. The goal of food packaging is to contain food in a cost-effective way that satisfies industry requirements and consumer desires, maintains food safety, and minimizes environmental impact (Marsh & Bugusu, 2007).

2.2.2 Packaging aspects in relation to food waste

As discussed in the introduction, packaging plays an important role in the food waste generation throughout the supply chain, but also at the post-purchase phase. The reasons for food waste generation related to packaging are the lack of protection, the size, the difficulty to reseal or store properly and the difficulty to empty the package completely (Williams et al., 2012).

Packaging aspects that cause food waste are found both at the time of purchasing the food and when using packaging at home. It is important to mention though that most consumers do not recognize indirect packaging attributes related to food waste, for example the lack of packaging (Williams et al., 2012). Furthermore, consumer behavior plays an important role and is crucial for the minimizing of food waste, but packaging can provide the information or the technology in order to guide the consumer.

2.2.3 Kano's theory and the difficulty to empty completely

Kano's theory of attractive quality shows the relationship between the degree of sufficiency and customer satisfaction with quality attribute. This relationship can be classified in five categories:

- Attractive quality attributes, which provide satisfaction when fulfilled and no dissatisfaction when not fulfilled (surprise/ delight attributes).
- One-dimensional quality attributes, which provide satisfaction when fulfilled and dissatisfaction when not fulfilled.
- Must-be quality attributes are taken for granted when fulfilled but result in dissatisfaction when not fulfilled.
- Indifferent quality attributes are perceived as neither good nor bad and therefore do not result in customer satisfaction or dissatisfaction.
- Reverse quality attributes result in dissatisfaction when fulfilled and satisfaction when not fulfilled. For example, when you want a basic model of a product you will be increasingly dissatisfied the more functions it has (Kano et al., 1984).

The difficulty to empty a packaging completely is presented as one-dimensional quality from the consumer's perspective. This means that this attribute results in satisfaction when fulfilled and dissatisfaction when not fulfilled (Löfgren & Witell, 2005). There have been complaints from consumers regarding their inability to empty the packaging completely. This problem can be solved by changing the shape of the packaging, by introducing new opening and reclosing possibilities or by changing the interior hydrophobic surface (Williams et al., 2008).

2.3 Food waste as a bigger environmental threat than packaging waste

For the public opinion packaging is still considered as a bigger environmental threat than food waste and it is still criticized a lot (WRAP, 2007). Furthermore, after the introduction of the Directive 94/62/EC on Packaging and Packaging Waste, there has been a lot of research and work towards the better use of natural resources and the minimization of the packaging carbon footprint (European Comission, 2006). Nevertheless, research studies during the last years gave a different perspective (Figure 3). Wikström and Williams developed a life cycle assessment (LCA) model in 2010 that analyses packaging solutions with the purpose of minimizing the environmental impact of the food packaging system. Their results showed that the environmental impact of packaging can be allowed to increase if the new packaging design reduces food losses, taking into consideration parameters such as the initial food losses, the product itself and the handling of both food and packaging waste. For example, a new packaging material that helps prevent cheese waste can be allowed to increase drastically its environmental impact (Williams & Wikström, 2011) or when it comes to sliced meat, the impact from throwing away ¼ of a pack, because the last couple of slices have gone a bit pale and greasy, are far higher than if an extra membrane is added in the package, so that the package can be opened in steps (Concito, 2011). LCAs for food packaging developments ought to take into consideration food losses across the supply chain; otherwise an important environmental issue is neglected (Williams et al., 2008)

Apart from that, usually the packaging's quality attributes, information regarding how to open and dose, easy to empty, leakage, date labeling, protection that appear to be most important for the consumer using Kano's theory are closely related to food losses (Williams et al., 2008).

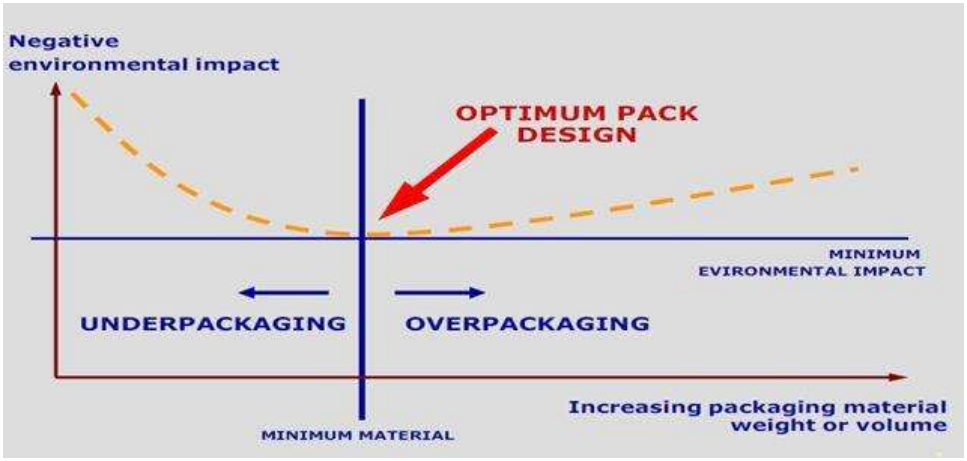

Figure 3: Optimum packaging (Source: "Packaging in the Sustainability Agenda: A guide for Corporate Decision Makers, 2009)

2.4 Demand for developments in packaging

Consumers are demanding more packaging innovations, particularly in relation to recycled content, recyclability and biodegradable materials. It is still uncertain, though, how these developments should be communicated to the consumers (through food/packaging manufacturers or retailers), because studies showed that only a minority of consumers are looking for environmental information on the packaging at the moment. Nevertheless, there is a need towards the development of such products.

A report (WRAP, 2013) investigated the consumer attitudes to food waste and food packaging, in order to identify possibilities towards the reduction of household food waste. Consumers were asked to select developments related to packaging that they found most useful and re-closable packaging was the most frequent answer among the results, with the figures reaching 56% of the respondents. In addition, popular demands were the packaging that keeps the product fresher for longer (40%) and split packs (32%). Re-fillable/ re-usable packaging was another frequent result with the figures reaching 30%.

The same survey showed that the priority for consumers is how long can the food remain fresh and packaging can play an important role in that. For instance, providing consumers with clear labeling on the pack, communicating to them the benefits of utilizing this information and providing improved packaging functionality could result both in consumers wasting less food, but also appreciating more the packaging that facilitates this.

Figure 4: Gas permeable packaging film from Evap.

In the past, there have been similar examples from companies, launching food packages that are directed towards the reduction of food waste (WRAP, 2012). Characteristic examples are the ones that follow:

- Asda is the second largest retail chain in the UK after Tesco by market share. It has launched a revolutionary new gas permeable packaging film from Evap for its Extra Jersey Royal Potatoes (Figure 4). This change in the packaging resulted in an extension of shelf life from 4 to 8 days, reducing waste levels of the product up to 50% throughout the supply chain and at home.
- Heinz introduced a 1kg reclosable polypropylene plastic bottle for their popular Heinz Beanz product (Figure 5). This packaging is developed with the focus on consumer convenience, time saving, portion control and shelf life extension. It helps consumers eat as much as they like and at the

Figure 5: Reclosable polypropylene plastic bottle from Heinz.

same time the bottle has a see – through portion control guide on the side.

- Warburtons is a British baking firm. In order to contribute to the food waste reduction, the company followed the Defra and Food Standards Agency guidance to change the labels, removing "display until". In that way, the "best before" date is easier to see, but also it helps staff when managing products on the shelf (Figure 6).

Figure 6: Change in the date labeling from Warburtons.

2.5 Environmental claims on packaging

Around 59% of all purchases are unplanned. Consumers tend to decide on the spot about their purchases and as a result, product packaging is an important communication tool and could have a great impact on consumer's decision process. Therefore, environmental claims on packaging for food are also very important.

Studies have showed that there appears a tendency to use more and more claims on packaging at the same time (Cousté, 2012). However, this appears to be quite risky, because the important claims might not be communicated to the consumers, who might not want to read all the claims or may get confused. In the same study, Cousté et al., believe that there is likely a threshold above which the number of claims causes confusion among consumers, especially if those claims refer to different packaging and product attributes.

At the moment, the most widely used claims regarding packaging are focused on the recyclability of the package, followed by "reusable" and "reduced packaging". Nevertheless, it is crucial to investigate what is the consumer's perception of these claims.

2.6 Consumers and environmental logos

Logos regarding environmental claims are receiving lately a lot of criticism. Ipsos MORI published a report in 2008 for Valpak and INCPEN (Ipsos Mori, 2008) regarding consumer's concerns and knowledge about packaging. This study presented the results from a survey that included interviews with 1,010 British adults. The results showed that consumer's awareness is very low when it comes to logo's identification (Figure 8). For instance, aside from the "recyclable" Mobius loop (correctly identified by 56%) only a minority could recognize the European Ecolabel (14%) or the PETE plastics recycling logo (20%).

The same study revealed that the main influences on consumer's attitudes are coming from the media, while only 24% of the respondents are influenced from the information on the packaging or in store.

However, the recognition of eco-labels in the Nordic countries is considered to be a success. Over 90% of the consumers in Sweden recognize the Swan label and slightly less in Norway, Finland and Denmark. At the same time, it is considered a trustworthy label from consumers (Leire & Åke, 2004).

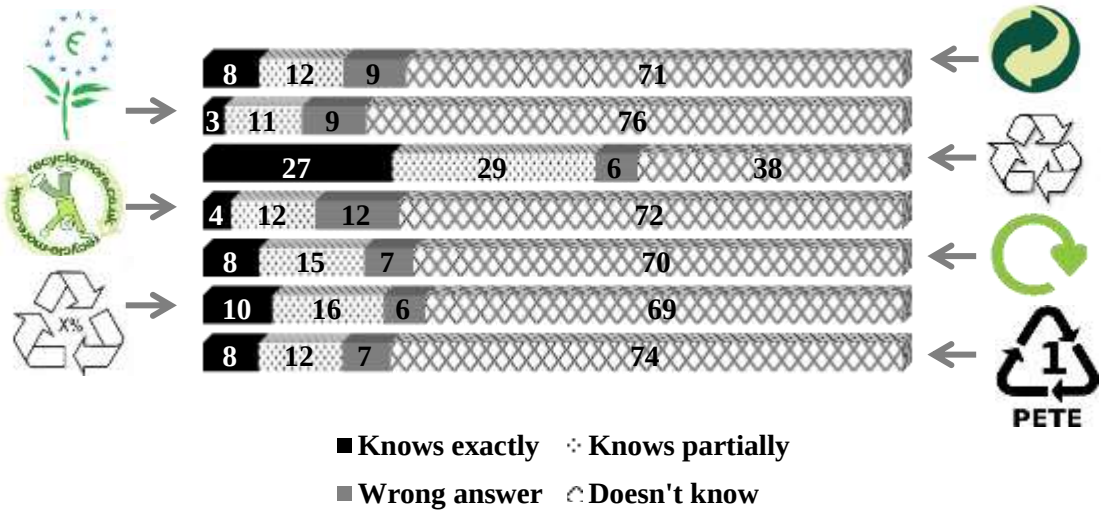

Figure 7: Consumer's awareness regarding environmental logos.

Chapter III Methodology

This study used a triangulation methodology of qualitative and quantitative methods and it investigated the potential market for a packaging that prevents food waste, because of its non-sticking properties, focusing on yogurt-based products. "Methodological triangulation" or mixed-methods research, uses more than one kind of method to study a phenomenon combining qualitative and quantitative data collection techniques (Bekhet & Zauszniewski, 2012). For this study we combined qualitative data resulting from interviews and quantitative data including analysis of questionnaires. This type of methodology will give us the opportunity to strengthen our results but also to possibly identify different conclusions from the qualitative and quantitative data and it is expected that the two different kinds of data collected can be complementary but also promote a discussion between a possible gap between the respondent's opinions and the consumer's perceptions.

The research involved a combination of both qualitative and quantitative

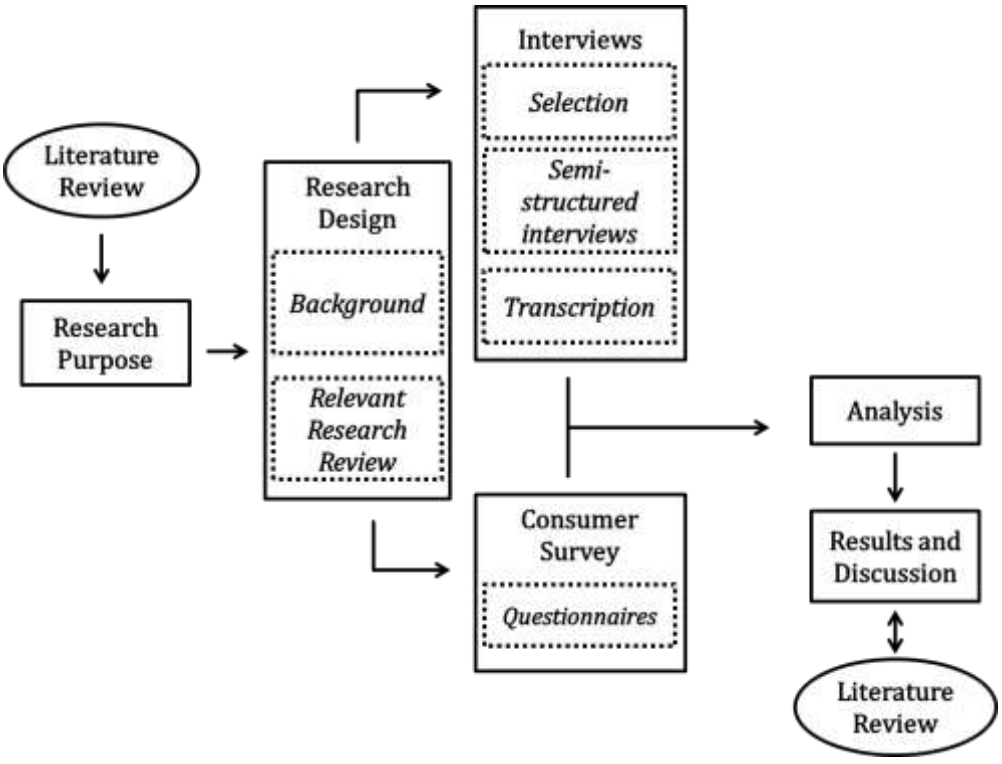

Figure 8: Research Process Overview

methods to better understand the investigated problem, including (a) a review on related publications on food waste and packaging, especially regarding the difficulty to empty aspect, (b) interviews with food manufacturers and influencers/experts on the matter and (c) a survey on consumers in two different markets, including both face-to-face and online questionnaires.

The research covered questions that were examined both qualitatively and quantitatively. The findings from one study will be expanded or elaborated by examining the findings from the other study and at the same time compared with literature findings (Barnham, 2012; Creswell, 1999).

3.1 Quantitative and Qualitative research

Quantitative research describes the collection of numeric information with an instrument, while qualitative research involves collecting text (e.g. interview data). In the last case, the researcher becomes the measuring instrument for the data collection (Cresweel, 1999; Merriam, 2010).

In contrast to quantitative research, qualitative relies on small sample sizes rather than larger representative ones (Mumford, 2012). The quality of a qualitative research mainly depends on the credibility and representativeness of the respondents, which includes their level of expertise and willingness to share information.

The main advantage of qualitative research is that it is more flexible than other kinds of research. In that case, the researcher is the one who takes the "measurements" and he can be immediately responsive and adaptive, can expand his understanding through both verbal and non-verbal communication and explore the respondent's answers. At the same time, it is easier to cover any gaps in theory or built a new one. Finally, the results are deeply descriptive (Merriam, 2010).

On the other hand, quantitative techniques are used to test hypotheses or measure the frequency of observations. The main advantage of quantitative research is that it can help the researcher gather data about different aspects of a phenomenon from many participants (Venkatesh et al., 2012). The disadvantage is that usually respondents are limited to a certain amount of answers and they cannot elaborate on the problem freely. For the purpose of this study, we used both face-to-face and online questionnaires. When it comes to face-to-face interviews, the researcher can evaluate the validity of the respondent's answers, since at the same time he is observing him. However, he cannot do that with online questionnaires. In that case, the respondent is answering with no supervision and at his own time (Barnham, 2012).

3.2 A review of previous research

To begin with it was necessary to map the existing information regarding food waste and the difficulty to empty the packaging, as well as previous consumer surveys related to this issue. In that way, a solid background was created, containing information from publications from academic or research institutions and organizations involved in the food waste issue. After an evaluation of the literature it was easier and there were more information for the decision over which companies and experts/influencers should be interviewed and which markets should be investigated for this project.

3.3 Interviews with Experts/Influencers/Customers

Interviews range from highly structured, targeting to a random sample, with close-ended questions, to unstructured, where the interviewee is asked to explore topic areas, but neither the questions nor the order are predetermined (Marvasti, 2003; Merriam, 2010). In this research a method falling in between those two was used. The semi-structured interview usually contains structured questions, since it is targeting to specific information, but at the same time, neither the exact wording nor the order of the questions is determined in advance. The quality of the data obtained through all kinds of interviews depends heavily upon the questions asked (Merriam, 2010). The same open-ended questions were asked to all interviewees, in order to be more easily analyzed and comparable (Valenzuela et al., 2012).

The respondents we chose were selected because of their expertise in the field (both for influencers and companies) and their activities in the investigated markets. Three key players in the dairy industry that hold a large share of the markets in Norway, Finland, Denmark and the Netherlands where chosen to represent Tetra Pak's customers. At the same time, three influencers from movements against food waste, and experts from organizations and the academia were interviewed (Table 1).

Other researchers might have referred to different experts or companies for information, but the ones selected for this research were considered representative at the time. In parallel, there was some guidance over the selection from Tetra Pak towards companies that have already expressed their interest over a packaging that prevents food waste or that are doing similar research on their own.

Table 1: List of interviewees

Position	Gender	Code	Type of interview	Country
Tetra Pak's Customers				
Packaging Development Manager	M	C1	Face-to-face	Finland
Manager Marketing & Product Development in Tetra Pak	M	T1	Face-to-face	Finland
Packaging Development Manager	M	C2a	Face-to-face	Norway
Packaging Development	M	C2b	Face-to-face	Norway
Brand Innovation Manager	M	C3	Face-to-face	Netherlands
International Account Director in Tetra Pak	M	T3	Face-to-face	Netherlands
Experts/Influencers				
Founder of a movement against food waste	F	E1	Skype	Denmark
Senior Lecturer, Karlstad University	F	E2	Skype	Sweden
Research Director	F	E3	Phone	UK

3.3.1 Set up of the interviews

The first step for the interviews was to find the correct contact in the different selected groups and arrange a meeting with them. This appeared to be quite challenging, because of their availability but also because of possible confidentiality issues. When we contacted the interviewees a short description of the project's aims was given to them and we asked the arrangement of a meeting. When possible, we tried to meet with the respondents and conduct face-to-face interviews, in order to provide a comfortable environment for the interviewees. The interviews with the

customers we conducted face-to-face, while the ones with the experts/influencers were via skype (Table 1).

The content of the interview was defined in consultation with Tetra Pak's marketing department and the Tetra Pak Key account managers for the selected customers/companies (Appendix I). The aim was to collect information regarding the following:

- the market for yogurt based products
- consumer's satisfaction when it comes to the used packaging
- consumer's behavior at the point-of-purchase
- consumer's interest and trust in environmental claims (logo use and recognition) and
- Information related to pricing of environmental friendly products was collected.

3.3.2 Execution and observation

At the meeting with the interviewees, we firstly explained the purpose of the interview and the terms of confidentiality. After that, they were asked to present themselves, their position in the company/organization and we clarified any doubts about the interview. After that, we shortly presented the project and the aims of our research. Before starting the interview, we asked permission to record it. Although, the questions were already formulated before the interview, each time the discussion between the interviewer and the interviewee affected the order and the time spent on each question. Nevertheless, the interview always started with fact-based questions, in order to make the interviewee as comfortable and involved in the interview as possible. Later on, more controversial questions were asked, resulting usually in a discussion between the participants. Finally, the respondents were asked to provide any further information they wanted to add. Each interview lasted on average 40 minutes.

Two respondents were present during the interviews with the customers. Regarding the interviews held with the customers in Finland and in the Netherlands, the Manager on Marketing and Product Development from Tetra Pak Finland and the International Account Director from Tetra Pak in the Netherlands also participated, giving their own perspective on the interviews. For the interview with the customer in Norway, the participants were also two. Both of them were from the Packaging Development Department. For the interviews with the experts/ influencers there was only one participant.

After the completion of each interview, they were transcribed and analyzed accordingly.

3.3.3. Interview data analysis

After each interview, we transcribed the recordings into text and we wrote down possible impressions from the interviews. The next step was to focus the analysis of the data by topic. As discussed above we had five different topics in which we focused during the interviews and these were the market for yogurt based products, the consumer's satisfaction when it comes to the used packaging, the consumer's behavior at the point-of-purchase, the consumer's interest and trust in environmental claims (logo use and recognition) and information related to pricing of environmental friendly products was collected. After that, we tried to identify common patterns in the respondents' answers and categorize them according to the group of respondents they belonged. Finally, we compared the findings with data coming from the literature review.

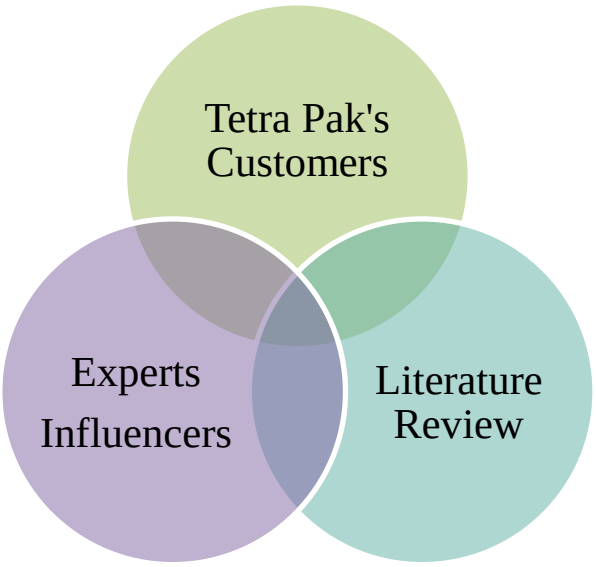

Figure 9: Analysis of the interview results.

3.4 Primary research/Quantitative data

The purpose of the quantitative study was to compare it with the key findings that had emerged from the interviews. A questionnaire was structured to correlate with the content of the interview questions, in order to identify possible gaps, between the food manufacturing industry as well as the influencer's experts on this matter and consumers' perceptions.

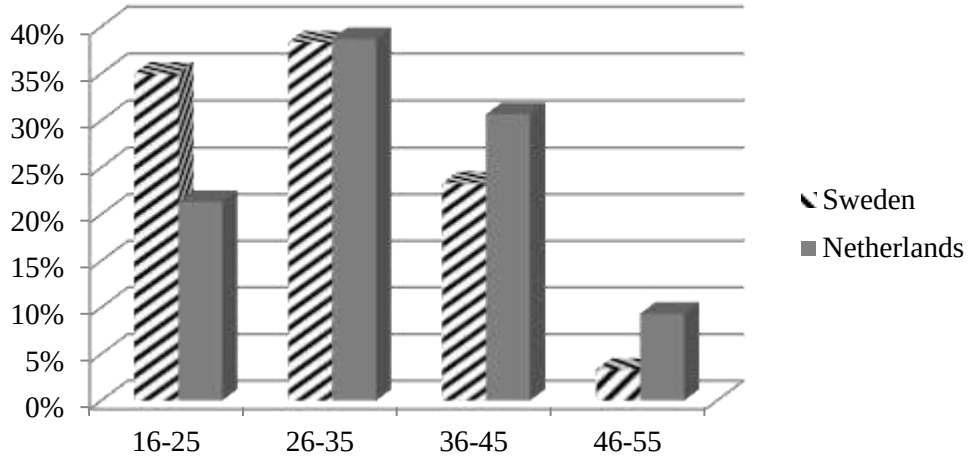

Figure 10: Age distribution of the respondents for the consumer survey in Sweden and in the Netherlands.

The age distribution of the respondents in the consumer survey is presented in figure 10. For Sweden, the majority of the respondents aged between 26-35 years old with the figures reaching 38,3%, while the ones aged from 16-25 years were 35% of the respondents. Among the respondents in Sweden 55% were women (Figure 11). Regarding the participants from the Netherlands, 38,7% aged between 26-35 while 30,7% were from 36-45 years old. 36% of the respondents in the Netherlands were males. The population from Sweden is on average younger than the one in the Netherlands, since the survey was conducted partly in Lund and it included a lot of students who are studying there.

For the questionnaire different statements regarding attitudes to food waste and to packaging, as well as purchase habits were posed to the respondents. Consumers were mainly asked multiple choice questions throughout the survey questionnaire, sometimes including the option "other, please specify". However, it should be taken into account the usually respondents tend to select one of the provided choices, since they prefer ticking an option than writing an answer. Moreover, respondents were asked to answer questions on a graded scale and they had to grade them from 1(do not agree at all), to 5(do fully agree).

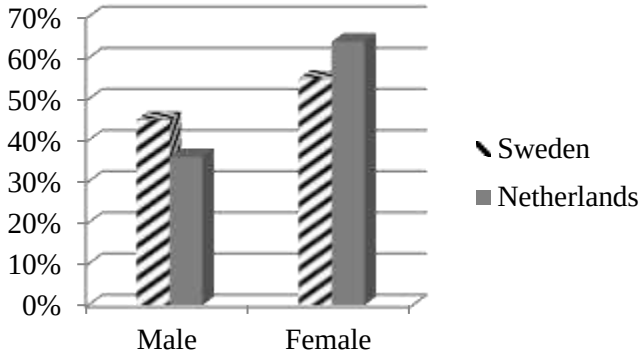

Figure 11: Female and male respondents for the consumer survey in Sweden and in the Netherlands.

3.4.1 Set up of the consumer survey

Two different markets were chosen for the primary research, Swedish and Dutch. In total 60 consumers from Sweden were asked to fill in the questionnaire, 45% of the respondents were coming from Malmö and the remaining from the city of Lund. The survey was conducted inside two central retail shops, ICA Kvantum Malmborgs Tuna in Lund and ICA Söder in Malmö. ICA AB is a Swedish retailing group and is the largest retail company in the Nordics.

As for the consumers in the Netherlands, the research was conducted in Amsterdam. It was harder to approach the consumers, because we were not allowed to fill in the questionnaires inside the retailers, so we had to do it outside. These made the respondents more reluctant to answer our questions and at the same time, they didn't have enough time and patience since they were carrying their groceries. Nevertheless, we managed to collect 40 responses and another 35 from online questionnaires using Google Forms.

These consumers were randomly chosen on their willingness to participate in this study. The questionnaires were collected in two working days for the market in the Netherlands and for three in Sweden.

3.4.2 Executions and observations

The respondents were approached and kindly asked whether they would like to participate in the survey, after explaining them the type and content of the project. If they were eager to participate, we were asking and filling the questionnaire for them.

3.3.3. Consumer survey data analysis

After gathering all the survey responses, we used Microsoft Excel to analyze the data. We generated graphical representations to create a summary of the results and to be able to analyze and discuss them.

Chapter IV: Results

In this chapter we are presenting the collected data. The results have been divided in three separate parts. The first part includes the information collected from the interviews conducted with Tetra Pak's customers, while in the second part the information from the interviews with the experts/influencers. In the last part are presented the consumer survey results. The main topics were the market and packaging for yogurt based products, insights about consumers, food waste, pricing and development cost and future developments. The analysis and the discussion follow in the next chapter.

4.1Interview Result

4.1.1 Interviews with Companies

4.1.1.1 Market and packaging for yogurt based products

Could you describe the market and the packaging for yogurt-based products?

Yogurt-based products and more specifically spoonable yogurt are consumed by the whole family, including children and elderly people. Specific products exist in the market that are targeting smaller market segments, such as value-added products with health benefits (i.e. less sugar), but the main brands from all the interviewed companies are for the whole family.

Figure 12: Gable Top Package and Cup

"It doesn't depend on your age or the age of your children, this product is for everyone. In Finland, consumers eat spoonable yogurt throughout the day, starting from breakfast or as a snack between meals or in the evening" states the respondent from the dairy industry in Finland. The same goes also with the market in Norway. The respondents said that they have a quite broad portfolio of products, *"targeting a wide range of the market, including yogurt based products for children"*. In the Netherlands, *"people use spoonable yogurt mostly for dessert after the evening meal or as breakfast in the morning […] from our research, it is shown that women and especially the ones between 20-40, have it as breakfast with fruits and cereals, while the rest of the consumers including families, and usually have it as a dessert".*

When it comes to packaging, 1L gable top packages represent the most common packages for spoonable yogurt in Finland and in the Netherlands, while in Norway, this kind of package was not as successful as cups and the industry is on its way of replacing them with the latter type of packaging (Figure 12). *"Although we do use bottle-looking gable top packages for drinking yogurt, Norwegian consumers prefer having spoonable yogurt in a cup"*. Comparing the Norwegian market with the Swedish one, the second interviewee from the dairy industry in Norway (C2b) said that *"What is interesting is that in Sweden, is not that only the drinking yogurts are in gable top packaging, but also regular yogurt is in the same packaging, even though it has a much higher viscosity"*. Moreover, although portion packs might be more popular packages for this kind of products in other markets, this doesn't appear to be the case in any of the three markets (Norway, Finland and Netherlands) according to the respondents, since the consumers tend to prefer family packs.

4.1.1.2 Insights about consumers

Could you tell me about any consumer research that you have done to investigate the consumer satisfaction of packaging used for your products?

In Finland and in the Netherlands gable top appears as the dominant type of packaging used for this kind of products, while in Norway is the cup. Although consumers are used to this packaging, since it is the one most companies are using, some complaints occur from the consumer regarding its functionality. For instance, consumers in Finland complained for the lack of a screw cap for several reasons. First of all, they tend to believe that the product can be easily contaminated if there is no screw cap to reseal the package after its opening. In addition, when the package has a screw cap it appears to be more convenient for consumers since they can also place it laying on the shelves of the fridge and not only standing at the door.

On the contrary, Dutch consumers perceive the presence of the screw cap as a disadvantage. Although they can handle in a better way the storage in their fridge, they claim to dislike when part of the product goes in the screw cap, since it can end up either on their hands or on the packaging when reusing it. Apart from that, there is

a tendency from consumers to drink the product directly from the packaging now that there is a screw cap, which sometimes results in contamination of the product and they complain back to the company that *"the product has gone bad"* (C3).

Except from the difficulty to empty the package, Norwegian consumers also claim that *"when you are using a gable top packaging, it is hard to get all of the product out, but it also doesn't look good either when you open the packaging and pour out the yogurt and then reclose it, since you still have some product left in the sealing area and that doesn't look very good when it has stayed open in your fridge for some days"*, said the respondent from Norway. At the same time, he gave an example from the packaging for milk, explaining that the last 7 years they gradually changed the milk carton packages from gable top to gable top with a screw cap, since consumers were demanding it.

The respondent from the dairy industry in Finland (C1) pointed out that according to the latest consumer surveys, the biggest problems for the Finnish consumers regarding the packaging are the resealability of the family packs (1L packages) and the difficulty to empty the container. In addition, *"some consumers prefer pouring the product through a screw cap and not directly from the packaging"*, said the Finnish respondent.

It is also important to mention, that yogurt based products used to be marketed in glass bottle a few years ago in the Netherlands. Consumers tend to perceive products in glass packages (transparent) as more fresh compared to the ones in carton packages.

How do consumers react to environmental claims? How do you think consumers value such developments? Do you have any related case studies to share?

All the respondents from the industry agreed that consumers expect from companies, especially the big ones, to take responsibility towards environmental issues. This appears as a general demand. *"If you don't have environmental friendly claims, it is a disadvantage, especially when your competitors do have, but on the other hand, if you have then, it is not considered an advantage"*, stated C3.

For example, the company in the Netherlands is already using FSC labels on their packages, while the one in Norway has recently introduced them to the market. In contrast, in Finland *"FSC logos are not commonly recognized among consumers which is the case in Sweden and Denmark, where it is high priority to have an FSC logo"* (T1). When it comes to environmental claims, the Finnish company is working more towards the packaging material, the recycling and the food waste issue.

How do you think that environmental friendly packaging is affecting the consumer decision at the point-of-purchase?

What all the respondents agreed in is that there are always many different things that companies want to communicate with the package. Information about the

product, the brand, the recycling, information required by law are already on the packages. As a result there is not so much space in the package, where you can communicate extra information and moreover there cannot be too many different messages on the package. *"The consumers don't have time to read it. Maybe when it is already on the coffee table or at the lunch table, they will read something on the package, but in the shop you don't have time and there is also no space on the package"* said C1.

What do you think about the consumer's logo recognition and understanding? Do you think that a logo stating reduction in food waste would be a good marketing tool?

"Logos are more for reassurance that companies take their responsibilities" said C3.

All respondents seem to agree that consumers are really confused with the different logos for products and in most cases they cannot relate with them. They also pointed out that this mainly results from the fact that there already are many different logo's coming from both third-party organizations, but also private companies, making it even harder for consumers.

A general discussion was held with all of them on the possible introduction of a logo that certifies food waste reduction, because of the packaging material. Although the majority of the respondents agreed that such a logo should be certified form a third party organization, C1 believes that at the moment it is hard to develop a logo like that. There need to be more studies regarding the reduction of food waste and "*then we can start thinking on how we can communicate this to the consumer, but we would be more interested in an individual claim and a direct comparison with what we can do compared to our competition"*.

Do you think consumers trust environmental claims from companies?

Two of the respondents from the companies agreed that consumers trust more environmental claims from third parties than from private companies. However, C1 stated also that it is also very important to build a good relationship with the consumers, *"building a strong relationship with your customers means that they will trust your claims"* said C1.

4.1.1.3 Food waste

Which do you believe are the main reasons for food waste generation in the post-purchase phase? More specifically, for what reasons related to packaging food is thrown away?

C2 stated that packaging design plays an important role in the food waste generation. Packages with sharp edges make it hard to take the entire product out. C3

also added that it is also important that packages are either from paperboard or plastic and are not transparent, so in many cases, consumers do not realise that there is still product left inside or how much product is left inside.

Resealability and packaging size was mentioned from all the respondents. As they agreed, it is important to reseal some of the products after opening, because it helps keep them fresh for longer. At the same time, it adds convenience in the packages and consumers are requesting it in most of the cases. When it comes to packaging size, they all agreed that larger packages have high probabilities to result in food waste since consumers buy more than what they need and the product usually expires before it is consumed.

Some of the respondents also mentioned "best before/use by date" as reasons for household food waste.

Retailers in several markets are also involved in campaigns promoting the reduction of food waste. At the same time they are putting pressure on food companies towards the development of more sustainable and environmental friendly products. Do you have any examples on that regarding food waste?

There were different answers from the respondents for this question. In Norway retailers are more focused on the logistics and not on the food waste generation. The same goes for the Finnish retailers. However, in the Netherlands, the situation is a bit different. According to C3, *"there has been a price war in the Dutch retail market for the last 9 years. They do ask developments towards the reduction of food waste, as long as you can do it for the same cost"*.

A consumer research in Sweden showed that consumers believe that 16% of the household food waste is related to packaging, identifying as the main reasons the size of the packaging and the difficulty to empty it. Have you had similar indications or complaints from consumers regarding the packaging size or the ability to empty it completely?

The answers varied while the respondents evaluated the different packaging attributes to food waste. *"In Norway, the complaints are mainly focused on the resealability of the packages, especially when it comes to cheese products and less for yogurt or milk, for which we use the screw caps"* said C2. Nevertheless, he also claimed that they do have complaints about product being left in the package, but it's not the main problem. Finnish consumers also claim to have difficulties emptying the package.

In the Netherlands though, *"consumers do complaint about the difficulty to empty the packaging, especially for products such as spoonable yogurt and custards"*. On the other hand though, *"when we didn't have the screw cap, people would open the package and see what is left, but they no longer do that because of the*

cap, so they don't know what is left inside. Nevertheless, they fold the package to squeeze the product out".

What percentage of food waste reduction do you think would be sufficient for the consumer?

The respondent C3from the Netherlands questioned whether the consumers are aware or not about the amount of product wasted in the packages.

However, respondents C1 and T1 from Finland agreed that *"considering that research shows that around 8-10% of the product is left in the package today, it would already be a good base for further development if we could achieve below 4-5% of product left in the package"*. Of course, all of them agreed that in the future the target would be to reduce as much waste as possible, but this also depends both on the product, the packaging material and the consumer's behaviour.

4.1.1.4 Pricing

Do you think that the consumers would be willing to pay more for value added packaging properties?

In the Netherlands, *"people are willing to pay more if there is a really big advantage for them"*, stated C3. He explained that consumers want to experience a difference in the product they are offered, if they are planning to spend more. Convenience is one of their higher priorities. *"I know that when we moved from the standard packaging to the one with a screw cap, we were able to raise the price by 1 cent maybe. But, for example, if you go from a two-step opening to a one-step opening, then you cannot ask for anything more, because you are not adding any convenience."* However, he emphasized that different parameters, such as your competitors, the market and the product itself should always be taken into consideration.

C1 also agreed with this. He explained that consumers appear to be ready to pay more for packages with good screw caps, when they notice that it is more convenient for them to pour, to reclose and even get the entire product out of the package. He explained though that there are consumers who are expecting companies to solve this problem without extra charge.

Nonetheless, C2 pointed out that many times consumers tend to be positive to this kind of changes when they are asked in a consumer survey, but *"they act the opposite way at the point of purchase"*. Both, C2 and C3 agreed that for spoonable yogurt, that is an everyday product, consumers will not spend a lot of time in front of the shelf evaluating their purchase. *"Decisions are made in a few seconds"* and price is really important especially for consumers with children, who are always more concerned about prices compared to the rest of the consumers, said C3.

C3 said that consumers are not aware of the amount of product they are losing. *"Let's say you offer a product that now helps you take all of your product out, I think that you cannot ask more for it. Because you are telling the consumers that they have a problem that they are not aware of."*

On the other hand, C1 and T1 agreed that you can raise the price, when it comes to value added products. *"If the product has already an added value and you offer some extra value in terms of functionality of the packaging or convenience, then people might be more willing to pay this extra cost, like a more premium product".*

The respondents from Norway also added that it's hard to say, but they think that most consumers would be positive, because there was an increased focus on food waste also in Norway over the past years.

What is the percentage range that you think can be charged more for an environmental friendly packaging?

All the respondents agreed that this is mainly a matter of marketing communication. "*I think if you want to charge a product premium, you really need to convince your customers over the benefits"* said C1. He also gave an example from milk products, pointing out that consumers were not willing to pay more for packages with a screw cap, compared to the ones without, in Finland. However, he said that the situation might be different when it comes to spoonable yogurt and food waste, because the product differs a lot, but still the price difference has to be very small, if there is any.

Moreover, T1 mentioned that it is very important to follow the range of prices that your competitors are charging. *"The consumers are always going to compare you with your competitors when they are standing in front of the shelf and this is a battle you have to win"*.

Another parameter that was mentioned from the respondents C2 and C3 was the presence of more and more private labels in the market, which are creating an even more competitive market. Consumers need to evaluate again, the products, the brands and the packages and decide how much they want to spend.

When it comes to numbers, C2 mentioned that a maximum of 5% could be charged extra, especially if the price per unit is already high. "If the package was smaller (smaller than 1L), like a portion pack, it could be easier to raise the price maybe by 10%, but since there is a big package, that already costs 35NOK 10% is a bit risky.

Concluding, all of the respondents agreed that this is an issue the marketing department has to handle.

A lot of consumers make price driven choices in the products they buy. Do you think this added feature will influence them at the point of purchase?

Added features in packaging play an important role in consumer's decision when choosing everyday products. *"It is not only a matter of food waste. For example I was very surprised when I was told that people have so small fridges that they have to keep the milk packages lying, so if they have the screw caps they have the possibility to do so, otherwise they cannot after opening. Or for example other people think that it is better to pour the milk out of the package from a screw cap and not directly from the package. And I think that is the same with the yogurt. If you keep your product for several days in the fridge the design of the package will play an important role in your decision. I don't think that it is only about food waste, but it is going to be an extra advantage that the package will have"* said C1 discussing about the advantages that a packaging material that prevents food sticking to the packaging would have from a holistic point of view.

Do you think environmental friendly products are considered premium and if not, how can the consumer's perception be changed about it?

C2 mentioned that the product is considered premium from the consumers, when there is a change in the design or if there is an added-value in the packaging. *"Consumers will not consider product premium only because of its price. The product should also look premium".*

T1 pointed out that consumers today are willing to buy consumer friendly packages, but not at any cost. *"There are quite some companies that are promising to provide more environmentally friendly products by 2020, so there is a big interest in it, but consumers will not be willing to pay a lot more for it".* Moreover, he continued saying, that companies have to provide more environmentally friendly packages, but they must give value on them and market it properly, if they want consumers to pay for it.

Some studies show that if consumers choose to buy green or value added products (which are more expensive than the regular ones), they may not be able to purchase the same amount of products as they used to do. Do you share this thought?

"Products need to jump out of the shelves into people's eyes", said C1. He also stated that the most important thing is to have products that people want to buy. Describing the decision process at the point of purchase, C1 highlighted that the most important thing for consumers is that they can easily find the product they want to buy on the shelf. Once they have it in their hands, they might start comparing the benefits from the product or the packaging, compared to the competitive ones, but that's not usually the case. *"Most of the people don't have time to spend in the shops and start comparing products. Their purchases are mainly impulsive and are driven from their habits"* stated C1 and C3. *"They will just pick up the things they need and head home – Only a few people have enough time"*. Of course, C1 explains that once

they are home, they might evaluate their purchases again and if consumers are not satisfied, for example because they cannot empty the package, they will not buy this product again. *"Environmental friendly packages are important, but they are not number one priority, even when selecting with your mind only on the packaging"*.

T1 also added that companies and researchers should always keep in mind that *"consumers are buying the products and not the packages. They buy the taste or they buy the products to cover some need. They are not buying the package, but of course they have to think of the whole offer, the product and the packaging material".* As he concludes, food waste is a growing issue and the next consumer generations will be more concerned about the consequences of their purchases, but today this trend is still at the beginning.

In addition, C2 from Norway said that this mainly depends on the product. He also added that the bigger the volume of the product is the harder it is to raise the price of it.

4.1.1.5 Development Cost

There is always a development cost for new product or packaging projects. The question that usually arises is who is supposed to pay for that: packaging companies, food companies, end-consumer? Could you say something about that?

C2 believes that theoretically, it should be the consumer the one who would have to pay for such a development. *"In practice though, I don't think that would work. Maybe it depends on the marketing team, the way they are going to communicate the added value of being environmentally friendly and probably communicate how much they are saving compared to the extra money they are paying"*. He added that you cannot expect the consumers accept and understand such a change by themselves. C3 also agreed that it is the consumer the one who usually pays the cost of such developments.

Consumers will be very satisfied with a packaging that helps them take all the product out of it says C1. "I don't believe there is going to be a difference in the price big enough to make them complaint". He also added that even if this packaging material is a bit more expensive it will compensate with the cost of the product lost, so consumers will still be satisfied.

4.1.2 Interviews with Experts/Influencers

This part of the analysis presents the results from the interviews with the experts/ influencers. During the interviews with them, the same template for interviews was used, apart from questions that referred directly to the company's

profile. The details of the interviewees and the coding for the data analysis can be found in Table 1.

4.1.2.1 Environmental claims

How do you think that environmental friendly packaging is affecting the consumer decision at the point-of-purchase?

The interviewees agreed with the respondents from the companies about the amount of information on the packages. They believe that there are already too many messages on the packages that consumers probably will not read them and us a result they will not affect their decision at the point-of-purchase. More specifically, E3 stressed the fact that, regarding everyday products, such as yogurt, consumers tend to be less interested and affected, especially at the point-of-purchase, while they pay more attention to such claims when it comes to more important purchases, for instance when buying a car or a fridge.

What do you think about the consumer's logo recognition and understanding? Do you think that a logo stating reduction in food waste would be a good marketing tool?

From the experts/influencers point of view, logos are still not a solution for the food waste issue related to packaging. *"Food producers are always very concerned not to put a lot of information on their labels and there is also a lot required by the law to make such a statement. Logos, such as FSC has been around for a long time and it is used broadly, but a logo regarding food waste would target in a really small area and I don't think consumers would be interested. Apart from that companies would have to substantiate them and I think it would be either impossible or very expensive"* said E3. She also pointed out that even if a logo like that would be developed right now, it would be difficult to make sure that the result would be satisfying in terms of food waste reduction, since consumer behavior should also be taken into consideration.

The researcher from Karlstad University (E2) also mentioned that *"consumers buy the products mainly for the content and not the packaging".* She believes that packaging does have some influence, but not that much. Nonetheless, she believes that a possible solution would be a logo that includes claims about the whole food-packaging system (packaging material, recyclability) and includes a claim regarding food waste generation.

In Denmark though, the respondent from an organizations against food waste indicated that they are working towards the development of a logo that could make sure that certain limitations, when it comes to food waste are being respected from the companies that would be certified with it. It goes without saying, that this would not only refer to the reduction of food losses because of the difficulty to empty the

packaging, but it would have a holistic approach in the supply chain and the food-packaging system. Nevertheless, official governmental organizations from Denmark stated in the public that they need to work on the reduction of the amount of logos, since there are already around 40 different types of logos, resulting in confusion for the consumers. But, E1 still supports similar initiatives from packaging companies that could make environmental claims on their packages against food waste, as part of their corporate social responsibility.

Do you think consumers trust environmental claims from companies?

All of the interviewees agreed that consumers trust more environmental claims from third parties than from private companies. For example, *"in Sweden the Nordic ecolabel or "Swan" and "Krav" have a good reputation , but as soon as it goes to private labels and claims it's probably no longer the same case"* according to E2. However, E3 stated that *"British consumers are skeptical. There have been so many green claims that they no longer distinguish the important ones."* Apart from that, a lot of green claims are being challenged from the Advertising Standards Authority right now in the UK, so consumers tend to be more unwilling to trust them.

4.1.2.2 Food waste

Which do you believe are the main reasons for food waste generation in the post-purchase phase? More specifically, for what reasons related to packaging food is thrown away?

"Although packaging is just a small part on the way to food waste generation, it is a matter that should be addressed" said E1.

The respondents agreed with the companies interviewees, pointing out at resealability, packaging size, "best before/use by" dates and the difficulty to empty as the most important packaging attributed to food waste generation.

It depends on the different parts of the world and on the different supply chains, said E3. She continued saying that getting everything out of the container is an important problem. Too little packaging is also another reason for food waste generation both in the post purchase phase, but also in earlier steps of the supply chain (distribution, retailers). For instance, this is really important since suppliers are pushed towards the development of lighter packages, which sometimes do not guarantee the safe handling and distribution of the products. Furthermore, E3 agreed on the fact that packaging design also plays an important role in the food waste generation (packaging design and material).

Retailers in several markets are also involved in campaigns promoting the reduction of food waste. At the same time they are putting pressure on food companies towards the development of more sustainable and environmental friendly products. Do you have any examples on that regarding food waste?

E3 said that there are some initiatives in the UK, for example from Sainsburry's, who are working with consumers and the usage of leftovers. In addition, she mentioned that there is a lot of effort coming from the retailers in all areas of packaging related to food waste like the date labelling, the portion packs and the resealability of the packages. However, she also pointed out that sometimes retailers are also demanding developments such lighter packages risking product waste. In parallel, she explained that *"many retailers don't really collect good statistics on product losses, or they put all the data together, for example whether it's down to something being damaged or out of its place or stolen, sometimes all that data is collected together as a financial value and they don't split it out, so it's quite difficult to understand why the damage occurs"*.

At the same time, E2 stated that *"retailers are really pushing backwards in the supply chain. They request developments such as packages that prolong shelf life, shelf ready packaging and selling fresh produce which requires special containers. Although, the main target is to reduce their own costs, it could also present some benefits towards the reduction of food waste".*

E1 said that in Denmark, retailers are also working with companies towards the reduction of food waste, mainly by participating in campaigns. However, she also mentioned that *"it should be kept in mind that food producers and retailers are also relying on the fact that we consumers waste food"*.

A consumer research in Sweden showed that consumers believe that 16% of the household food waste is related to packaging, identifying as the main reasons the size of the packaging and the difficulty to empty it. Have you had similar indications or complaints from consumers regarding the packaging size or the ability to empty it completely?

"Emptying the package is not a problem among consumers in the UK", said E3. There used to be a forum for consumers called the "Packaging Standards Council", where consumers could bring their complaints about packaging. This had been running from 1993 till 2011. The main complaint coming from consumers was that there is too much packaging. They were mainly focused on that disregarding any other packaging problems. *"In addition, consumers would identify problems such as the difficulty to open the package, but not the difficulty to empty, at least at that time"* stated E3.

4.1.2.3 Pricing

Do you think that the consumers would be willing to pay more for value added packaging properties?

E3 pointed out that *"consumers will not pay more or choose to buy something that they believe it's just a commodity"*. She continued saying that research shows that people actually make purchases based on quality and price, some people want good quality or are prepared to pay a little bit more. On the other hand there are also consumers who are happy with whatever the quality turns out to be. They will base their purchases on price.

In addition, E2 mentioned that once a product like that will be in the market, consumers are going to demand to have this type of packaging in all high viscous products. Concluding, all of the respondents agreed that this is an issue the marketing department has to handle. *"You need to talk to the consumer and push the correct buttons on telling the story",* said E3.

Do you think environmental friendly products are considered premium and if not, how can the consumer's perception be changed about it?

E1 said that consumer's perception on premium product depends on the market also. *"Northern Europe has much better economy than the south for example. People here (Denmark) can afford to be more environmentally concerned. When you have financial problems you don't think about the environment, but only how to put food on your table and any product that exceeds average is considered premium. We shouldn't put too much responsibility on the consumers, but try to help them to have the right approach. Raising awareness is the right approach. It is about education".* In addition, she mentioned a survey that shows *"saving money"* as the most important reason for Danish consumers when changing behaviors. When asked, Danish consumers claimed that they want to save food because it is a waste of money as well, not because of the hunger problems in the world or for the environmental effect. *"So this is the way companies should approach consumers too".*

4.1.2.4 Development Cost

There is always a development cost for new product or packaging projects. The question that usually arises is who is supposed to pay for that: packaging companies, food companies, end-consumer? Could you say something about that?

E3 belives that companies can charge a little bit more for that, but they will have to talk to consumers about this change to make it acceptable. On the other hand, E2 thinks, that it might be a cost that has to be absorbed from the packaging

manufacturers and be seen as an investment. *"But it depends on how many products are they expecting to be launched with this packaging".*

However, E1 said that it is always the consumer the one who pays for such developments in the end. Nevertheless, she stated that if companies manage to make a good solution, they can charge a bit extra.

4.1.2.5 Further developments

Which are the packaging attributes that you think should be in focus for further development and improvement in order to reduce food waste?

"Except from the way to empty easily the package, perhaps the most important or one of the most important is the size of the packages" stresses E1. E2 agreed and added that the population, especially in Europe, is aging and this increases both small and single households. This will also help towards the reduction of food waste, since consumers will probably be buying exactly as much product as they need.

They all agreed that there are many different packaging functions that you can work with. Prolonging shelf life is also a *"hot issue"*, as E3 mentions and there are a lot of initiatives in that direction.

4.2 Consumer Survey Results

The previous section highlighted the main interview results. In this one, the main results from the consumer survey conducted in Sweden and in the Netherlands will be presented. As mentioned in the methodology chapter, the questionnaire was formed in accordance with the interview main topics.

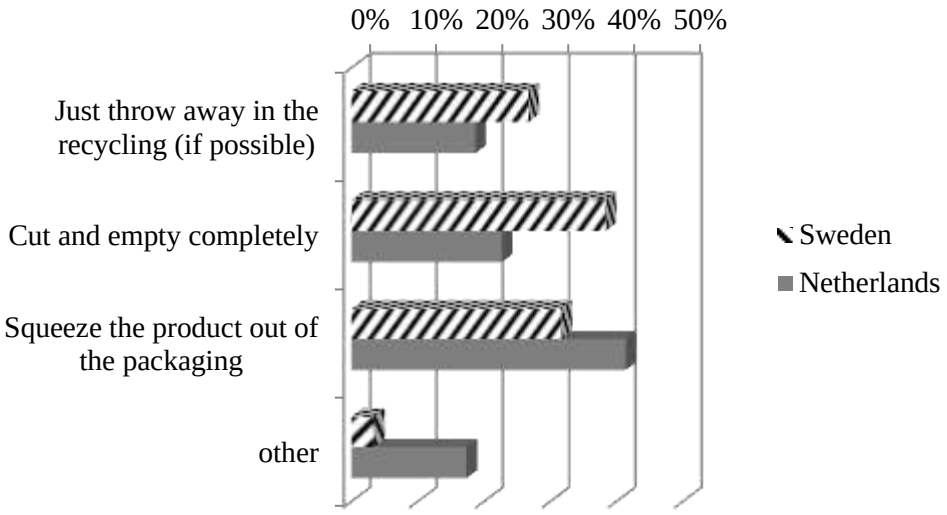

Figure 13: When it comes to spoonable yogurt, how do you usually dispose the packaging?

4.2.1 Disposal of yogurt based product packaging.

The question addressed to the consumers was *"How do you usually dispose the packaging of yogurt-based products?".* The results are presented in Figure 13. 38,3% of the Swedish consumers answered that they cut or open the packaging in order to empty it totally, in comparison with 22,7% of the Dutch consumers who do the same thing. In addition, 17,3% of the consumers in the Netherlands stated not to use any of the mentioned methods, since when the product is almost finished, they mix it with juice in order to take all the product out of the package. Moreover, 26,7% of the consumers in Sweden claimed that they "just throw away the package" after rinsing it in the sink. They explained that they do so sometimes, because they don't have time to do something else.

4.2.2 An estimation of the amount of product thrown away with the packaging

As part of the questionnaire, the consumers were also asked if they can estimate the amount of product that is being left in the 1L package, because they cannot or will not take out of it in volume ranges. The equivalent percentage ranges can be found in Table 2.

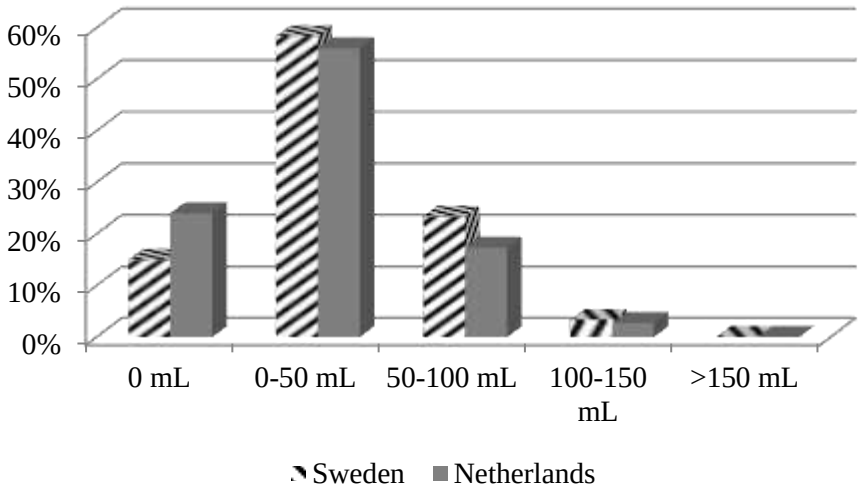

Figure 14: Are you throwing any yogurt away? If yes, please estimate the amount of yogurt you are throwing away with the packaging.

As seen on Figure14, the majority of the respondents claimed that 0-50 mL remains in the package, reaching a peak of 58,3% for Swedish and 56% for Dutch consumers. Furthermore, the figures for consumers that said not to throw away any of the product and the ones who believe that they probably throw away 50-100mL, fluctuated at around 16% and 24% for both markets.

Table 2: Volume and Percentage of wasted product

Volume (mL)	Volume (%)
0	0
0-50	0-5
50-100	5-10
100-150	10-15
>150	>15

4.2.3 Statements

At the end of the consumer survey we also asked the consumers to evaluate some statements from *"Fully Disagree"* to *"Strongly Agree"*. The results from the two markets are shown in the Figures 15 and 16. The statements were about the importance of price at the purchase decision and in comparison with the will to buy environmental friendly products, the tendency of the consumers to buy or not

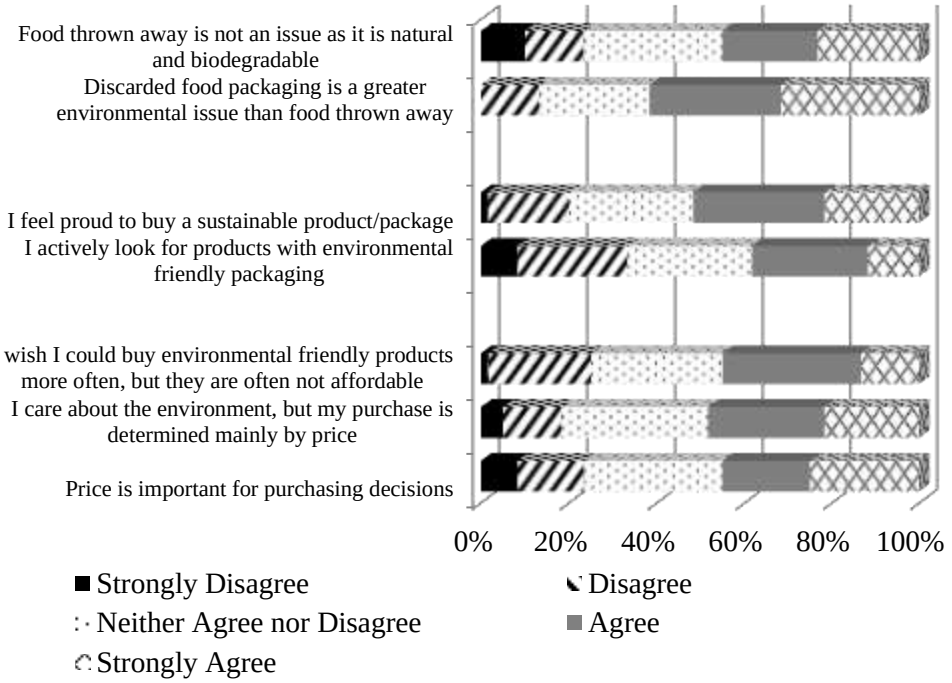

Figure 15: Consumer's agreement on statements regarding food and packaging waste, environmentally friendly packages and pricing in Sweden.

products with environmentally friendly package and the importance of the environmental effect of food waste compared to packaging waste.

4.2.3.1 For Sweden

45% of the Swedish consumers agreed/strongly agreed that *"food thrown away is not an issue as it is natural and biodegradable"*, while 61,7% agreed/strongly agreed that *"Discarded food packaging is a greater environmental issue than food thrown away"* Furthermore, 45% stated that price is important for their purchasing decisions (Figure 15). At the same time, although 51,7% of the respondents claimed that they feel proud when buying a sustainable product package, 45% claimed that they wish they could buy environmental friendly products more often, but they are often not affordable.

4.2.3.2 For the Netherlands

For the Dutch consumers, the price of the products appears to be very important. 50,7% agreed that *"I do care about the environment, but my purchases are determined mainly by price".* Moreover, 61,3% of them agreed that food packaging is a greater environmental issue than food thrown away (Figure 16).

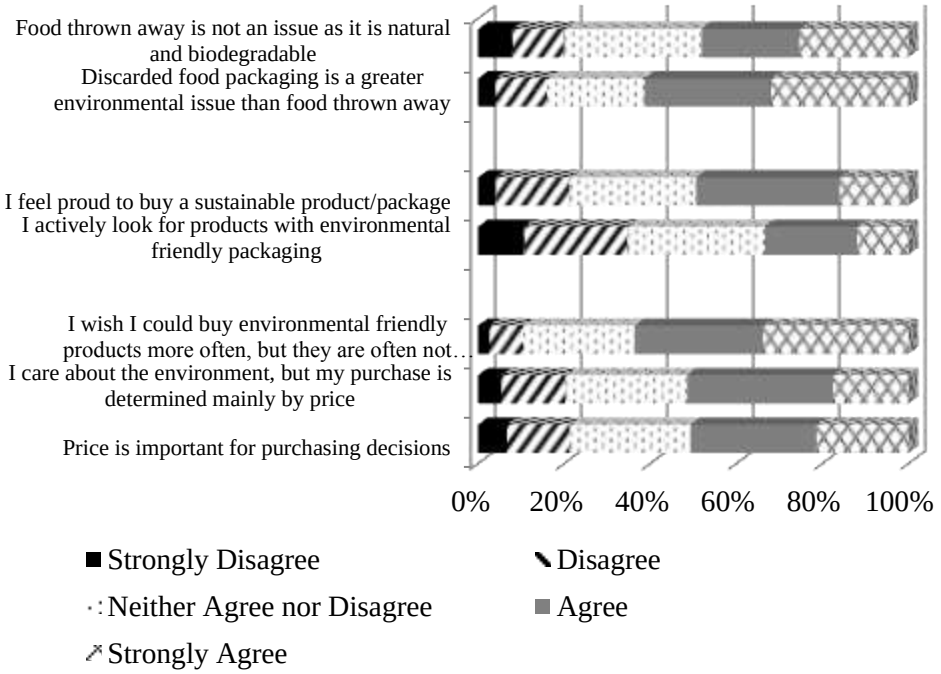

Figure 16: Consumer's agreement level on statements regarding food and packaging waste, environmentally friendly packages and pricing in the Netherlands.

4.2.4 Willingness to pay more

Consumers in both markets were asked about their willingness to pay more for a packaging that would be easier to empty (Figure 17). 35% of the Swedish consumers appeared positive to pay more for this type of packaging. Consumers in the Netherlands, appeared to be less willing to pay the additional cost, with the figures reaching 29,3% for the respondents who are prepared to pay a little more/a lot more if necessary.

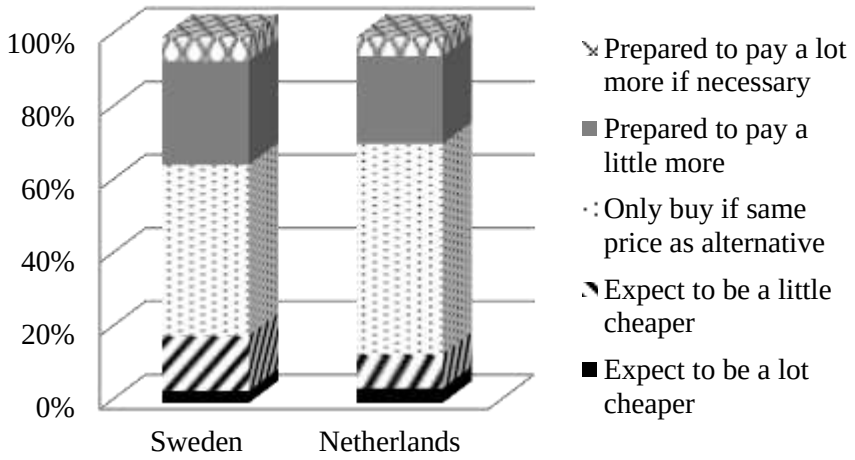

Figure 17: Consumer's willingness to pay for a packaging with non-sticking properties in Sweden and in the Netherlands.

Chapter V: Discussion

After having conducted and compiled the interviews, it is time for further analysis. The data collected are evaluated together with results from the literature reviews. It was also important for the research to identify possible convergence between the data collected from the industry and experts compared to the consumer's perception.

5.1 Discuss interviews with customers/influencers

Upon interviewing both, the three companies that work with Tetra Pak and the three influencers/ experts on the food waste issue, we collected a lot of information regarding the market for a packaging with non-sticking properties that helps reduce the yogurt residues inside the packaging.

5.1.1 Market and Packaging Type

To begin with, we specified the market for spoonable yogurt. All the customers agreed that is a product that targets the whole family and it is being consumed throughout the day, as breakfast or as a snack between meals. We identified some differences between the packages used in the different markets. The most common package is gable top, with or without the screw cap, although in Norway this is not the case and the majority of gable top packages have been replaced by cups, because of the consumer demand.

This can also be explained because of the product differences between the markets. In Norway yogurt has higher viscosity compared to the one in the other investigated markets, so consumers prefer to have it in cups. Gable top is used for drinking yogurt products. At the same time, this could be an indication that consumers perceived the difficulty to empty the packaging as a problem when the product was in gable top packages and this was the reason why they demanded having it in a cup.

5.1.2 Reasons for food waste generation related to packaging

All the respondents agreed that there are several factors related to packaging that contribute to food waste generation. The packaging size, use by/best before dates,

the resealability, the packaging design (geometry and light weight packaging) and the difficulty to empty are some of the reasons. Similar results have been published from other research projects as well as from WRAP's studies. Another reason that was also mentioned from a customer is that since paperboard packaging is used, consumers cannot actually see how much product is left in the package.

In addition, we discussed about the factors that consumers recognized as packaging problems. Some of them are also related either directly or indirectly to food waste generation, like the presence or not of the screw caps. An interesting result was that although companies offer solution to some of the problem consumers complain about, consumer's behavior might not bring the predicted result. For example, the solution to the resealing problem of packages was the screw cap. Although, it was a good solution because it is easy to close the package again once you open it, you can store the package standing regularly or upside down (to also help the product get out of the package) or laying on the shelves and improves pouring of the product, consumers started using it in order to eat the product directly from the package, lowering its shelf life or in other cases, the presence of the screw cap prevented them from opening the package and see the product that is left inside. This is also confirmed from another research held in Sweden, in which the majority of the respondents claimed that they do not like the presence of a screw lid on the liquid board packaging (Williams et al., 2012).

5.1.3 Environmental claims

Concerning environmental claims from companies, we focused the interview with the respondents on the way these claims affect the decision process of the consumers at the point of purchase and the consumers trust on claims coming from private companies. The experts in the field stated that consumers trust more environmental claims coming from third parties. This indicated that a potential environmental claim regarding the reduction of food waste would be more appealing to the consumers if it was stated from an independent party. For example, according to E1 in Denmark the ministry of Environment is actually collaborating with organizations against food waste in order to evaluate possible methods of communicating such claims to the consumers, for example logos. In that way, it will be easier for the consumers to evaluate and trust these claims, since they will be addressed from independent parties and companies that will be using these claims will be controlled and certified from an official actor.

In terms of consumers evaluating environmental claims on the packages at the point of purchase, the respondents said that consumers don't have the time to do it. Usually, when it comes to products such as spoonable yogurt, consumers are doing repeated purchases. They have a brand or a type of product that they are used to consuming and usually it is hard to change. At the same time, this means that once in the supermarket, these purchases are impulsive, mainly driven by the habit and done in a few seconds, especially since these products belong to the weekly shopping list. Of course, if the consumer is no longer satisfied with the product or its packaging, he

will reevaluate his options. C1 stressed the fact that even in everyday products, consumers would consider their convenience and pick the product that would facilitate their needs the most.

On the other hand, when we focused our discussion on the FSC logo, the respondents from the companies said that consumers do not consider it as an advantage when companies have such claims; however it is a disadvantage when they don't. Consumers want to see the companies they trust to be environmentally and social responsible and it is a way for companies to distinguish from their competition. Especially the last years, green claims have been used as a strong marketing communication tool from a lot of companies, related to both food and packaging. For instance, there are many companies that have stated their environmental targets for 2020, including Tetra Pak that is focusing on reducing the Carbon footprint across the value chain, targeting to the use of only renewable materials and zero waste.

5.1.4 Logos

During the interviews, we asked the respondents about their opinion on a logo that would certify the reduction of food waste because of the packaging material, as a marketing communication tool to help consumers choose products, not only because of the product itself, but also because of the packaging. All the respondents believe that such an implementation would not bring the desirable results. To begin with, there are already too many logos in the market and consumers are very confused about the correct meaning of each one, which comes in agreement with the report from Ipsos Moris in 2008. Apart from that, it would be difficult to apply this on the packages for different reasons. First of all, the questions addressed are who is going to certify such a logo. Would it be a private company or third party? The customers from Norway and the Netherlands also said that it would be hard even to make such a claim. For example, it would represent a reduction on food waste, but the questions is if that would concern only the packaging or a certain phase in the supply chain.

In the end, the experts in the field agreed that a solution could be the use of a logo concerning food waste, but it would have to take into consideration a bigger part of the food-packaging system and include for example an indication for good practice against food waste over the whole supply chain. On the other hand Tetra Pak's customer from Finland, stated that it would be important for them to make their own claim against food waste and use it also as a communication tool to differentiate from their competitors. This has comes to agreement with the study from Leire and Thidell, who mentioned that environmental marketing and self-declared claims of producers can also be an alternative for product groups in which labeling is considered less suitable, but the information regarding how well this could work is not sufficient.

On the other hand though, according to the confusion caused by the numerous labels is overstated. As they discuss in their paper, the main eco-labels have significantly higher recognition when compared to other labels. As a result, they believe, that probably consumers are not confused during their daily purchases, since

they can recognize the main ones. However, they point out the fact that there is a need of further research to investigate potential correlations between consumers who emphasis their confusion and distrust in the eco-labeling schemes and those who are not likely to prioritize green products anyway (Leire & Åke, 2004).

In addition, retailers could play a role in raising the logo recognition among consumers, since right now the main problem is that there is not sufficient information.

5.1.5 Retailers

Regarding the retailers, one customer and two influencers mentioned that they do put pressure backwards in the supply chain, at least in markets like the UK, the Netherlands and Denmark, but the developments they are mainly asking for the time being concern mainly logistical issues or shelf ready packages and packages that prolong the shelf life. At the moment, some are working on campaigns against food waste, but they are mainly focusing on changing consumer behavior.

Nevertheless, it is certain that all the attention that is being drawn to the reduction of food waste, will also present more opportunities for retailers. An easy to empty packaging solution, will be interesting for them, firstly because they could combine it with the rest of the campaigns that they might be already running, presenting a more holistic view towards the waste reduction. At the same time, this packaging technology could be applied to more than one product and maybe not only food products and retailers could probably be the ones to put pressure to manufacturers.

5.1.6 Desirable percentage of food waste reduction

The respondents, who are working on the reduction of food waste with the packaging material and design, estimated the levels of food residues inside the packaging for spoonable products as 8-10% which corresponds well with data from literature (Hansson, 2011). They believe that a reduction of 50% would be a good approach at this point. The question though that still remains is whether the consumers will be able to identify this food waste reduction. Depending on the market and the packaging used, consumers have different perceptions of the amount of product wasted. The key factor in this case again will be the marketing communication strategy that the companies are going to use. It will have to highlight the difference with the developed packages and focus on the benefit both for the consumer and the environment.

5.1.7 Pricing

Respondents pointed at convenience and added value as the main possibilities to raise the price of a product. Consumers need to recognize the advantage of buying a product and the extra value or feature that this will provide them. Otherwise they will not be willing to pay more for it. Furthermore, they agreed that two important factors should always be taken into consideration. First of all, consumers tend to act differently than what they claim. In many consumer surveys they express their willingness to pay more, but at the point-of-purchase they don't act as claimed (Podsakoff, 2003). At the same time, when deciding on the price of the product it is crucial to reflect also on the competitive products' prices.

5.2 Discuss the consumer survey results

In this section we analyze the results from the consumer survey and compare them to similar surveys that have already been done. The consumer survey we conducted included 60 respondents from Sweden and 75 from the Netherlands (40 questionnaires filled in Amsterdam and 35 online). When analyzing surveys like this one, it is important to know that usually people tend to respond/behave more to what they believe is socially desirable rather than to be truthful in surveys and questionnaires (Podsakoff, 2003).

5.2.1 Disposal of yogurt based product packaging

The consumers were asked about the way they are usually disposing the packages of spoonable yogurt. In that way we tried to identify if they are already recognizing the wasted product inside the packaging as a problem. The majority of the respondents in Sweden said that they usually cut, open and try to empty completely the packaging while the second most popular answer was that they squeeze the product out of the package. This points out the fact that they do realize there is an amount of the product left inside and they are making an effort to take it out. There was also a big part of the respondents (26%) that said they are just throwing away the package in the recycling after rinsing it. For this group, it is not clear whether they identify the food waste issue or not. There is the probability that they do identify it, but they don't have the time or they don't want to make the effort to take the product out, because they believe it is not a lot. Another explanation would be that they cannot take the product out, for example this could be a reason for older people, but in the respondents of this survey were mainly younger people.

In the Netherlands, we had similar results, although squeezing the product out appeared as the most common practice. What was also interesting in that case, is that a lot of the respondents chose the "other" option. They explained during the interview

that they sometimes, mix the leftovers of the yogurt with juice, so that they can take all of the product out.

5.2.2 An estimation of the amount of product thrown away with the packaging

The majority of the consumers in both markets answered that the amount of the product left in the package is 0-50mL. Research has showed that the amount of wasted product is higher and at least 8-10% if consumers do not open the package (Hansson, 2011). There is a study that shows that even when consumers think the package is totally empty, there is still left around 3% of the product inside. At the same time, 15% and 24% of the respondents in Sweden and in the Netherlands respectively, claimed that there is no product left in the package. There was also a small part of the consumers who claimed that the amount of product left in the package is 100-150mL which is very high (10-15% of the 1L package).

5.2.3 Statements

This part of the consumer survey highlighted the fact that for consumers food packaging is still a greater environmental threat than food waste. In consumer's minds, packaging still remains a bigger problem. Nevertheless, the figures (61,7% for Swedish and 61,3% for Dutch consumers) appear to be improved compared to the study conducted by WRAP in 2007. Comparing the environmental effect of food packaging and food waste 91,8% of the consumers participating in WRAP's survey identified packaging as much worse than food waste.

Moreover, a large amount of the respondents believe that food thrown away is not an environmental issue because it is natural and biodegradable. The figures reached 45% for Swedish and 48% for Dutch consumers. Compared to the same study from WRAP (reference) the figures are again improved. In WRAP's study (2007), 60% of the consumers agreed to some extent with this statement but less than 10% agreed strongly that food waste is not a problem as it is natural. From the ones that disagreed with this statement, many mentioned moral or financial reasons for their disagreement.

However, in recent studies, consumers appear to consider both issues (food and packaging waste) to be 'equally problematic' and do not have a fixed opinion as to which is 'worse'. In addition, consumers claim to blame equally both and usually the ones who are concerned about the packaging are also concerned about wasted food (WRAP, 2013).

When it comes to pricing, consumers consider environmental friendly products more expensive and sometimes not affordable. However, they feel proud when purchasing those kinds of products and they wish they could buy them more often. More Swedish consumers claim to actively look environmental friendly

products compared to the Dutch ones, while price driven choices are more common for Dutch consumers. In this type of statements it is important to keep in mind that usually people tend to respond/behave the way they believe is socially desirable (Podsakoff, 2003).

5.2.4 Willingness to pay more

Consumers in both markets were asked about their willingness to pay more for a packaging that would be easy to empty (Figure 17). The Swedish consumers appeared to be more willing to pay for such a package. 43,4% Swedish consumers claimed that they are prepared to pay a lot more or a little more, while the consumers in the Netherlands, were more reluctant, with the figures reaching 29,3%. This may be due to the fact that consumers in Sweden might be more aware of the environmental effect of food waste. At the same time, we should also keep in mind that the price war that is taking place in the Netherlands, probably drives Dutch consumers to make more price driven choices compared to the Swedish consumers.

However, price could also be a trigger for consumers in order to choose a package that helps prevent food waste. Using a communication strategy that highlights wasting good food as a waste of money would motivate people to choose a package like that. The environment is a much weaker concern for consumers (WRAP, 2007).

Chapter VI: Conclusions

The purpose of this master thesis was to help align the material development strategy of Tetra Pak with an understanding of the market for a packaging that prevents food waste. More specifically, the goal of the research was to identify the characteristics of this market in terms of consumer's value, awareness, demands and future trends. We investigated the market conditions for a paper based packaging with non-sticking properties for yoghurt-based products

Packaging and its functions play a significant role for the amount of food wasted not only across the supply chain, but also in the post-purchase phase. Yogurt based products are characteristic examples of food being wasted inside the packaging because of the difficulty to empty it due to the high viscosity of the product.

The problem of food being wasted inside the packaging is recognized from the consumers although they cannot estimate the amount of product that is being thrown away with the packaging. When launching a packaging material with non-sticking properties it will be important to communicate its properties to the consumers in a very coherent way. There are already consumers in the market who would be willing to pay more for an environmental friendly package. According to Tetra Pak, these consumers account for 5-15% of the market and they are characterized as "green" consumers. In order to approach more consumers it is crucial to add value for them. Convenience and value for money, which means that it's not just waste of food, but also waste of money, are the main priorities for the consumers.

Retailers can also contribute in the communication of a packaging material like that. Many of them have already campaigns targeting the reduction of food waste. The promotion of a package that helps reduce the food residues can be well in tune with the campaigns against household food waste. In that way, it is evident that the information sharing and the promotion management will be improved.

Finally, although it is not definite whether the market is ready for a package like this, it should be taken into consideration that the company that will first launch an innovative product like that will have a competitive benefit. At the same time, it is our belief that consumers are going to demand the application of the same packaging material to other food products that present the same problem.

Chapter VII: Proposals for future research

To understand the market for a packaging material that has non-sticking properties, further investigation needs to be done including both qualitative and quantitative data. For the time being, we can draw some conclusions but, this study was mainly an exploratory study. We included two different markets with some qualitative data and we also interviewed companies and experts/influencers from different European countries, who play an important role each one in their field. Some of the follow suggestions could bring a better understanding of the market and potential business opportunities:

- The next step could be to try to include more actors from the supply chain. First of all, as part of this research we did not collect any data from retailers. As we discussed above, they also play an important role, since sometimes they put pressure backwards in the supply chain, but they also are involved in initiatives towards the food waste reduction and raising the consumer awareness.
- Furthermore, it would be very interesting to interview and collect information from the waste management sector. It is important to see, how are waste management companies handling packages with unintended product residues and what is the effect of the remaining product on the recycled material.
- Focusing on one market and make a more in depth research both in terms of the actors in the supply chain and the consumers.
- For this study we did a consumer survey using questionnaires as a form for collecting data. A next step would be to form focus groups with consumers. It will be important to observe them using and discarding the packaging for yogurt-based products and then collect information through interviews and discussion in the group about their experience. It would also be of great value to introduce to this group, samples of the developed packages and allow the consumers to use them with the products they are used to.
- Early in 2011, the European Parliament proposed that 2013 will be declared the "European Year for the fight against food waste", as a key information and awareness raising initiative for European citizens and to focus national governments' attention (European Parliament, 2011). This means that there is going to be an increase in the awareness among consumers regarding food waste and its environmental impact. It would be a good idea to re-evaluate

the consumer’s perception after that and investigate the potential launching of such a packaging material.

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Appendix

Appendix I: Interview template

Short topic presentation

The interview is introduced by a briefing in which we will define the project, we will briefly discuss about the purpose of the interview, the use of a sound recorder, and we will ask if the interviewee has any questions before starting.

The aims of the interview are to:

- *Bring knowledge and understanding about the market for a packaging material that prevents food waste due to its non-sticking properties.*
- *Identify the characteristics in terms of consumer's value, awareness, demands and future trends.*

More specifically, we are focusing our research on yogurt based products.

Participation in the interview is voluntary and confidential. The analysis will be done in a way that prevents the identification of individuals in the publication of the findings.

Market for yogurt based products

Could you describe the market for yogurt-based products? (Age, gender, income, lifestyle)

Insights about consumers

Could you tell me about any consumer research that you have done to investigate the consumer satisfaction of packaging used for your products?

How do consumers react to environmental claims? How do you think consumers value such developments? Do you have any related case studies to share?

How do you think that environmental friendly packaging is affecting the consumer decision at the point-of-purchase?

What do you think about the consumer's logo recognition and understanding? Do you think that a logo stating reduction in food waste would be a good marketing tool?

Do you think consumers trust environmental claims from companies?

Food waste

Which do you believe are the main reasons for food waste generation in the post-purchase phase? More specifically, for what reasons related to packaging food is thrown away?

Retailers in several markets are also involved in campaigns promoting the reduction of food waste. At the same time they are putting pressure on food companies towards the development of more sustainable and environmental friendly products. Do you have any examples on that regarding food waste?

A consumer research in Sweden showed that consumers believe that 16% of the household food waste is related to packaging, identifying as the main reasons the size of the packaging and the difficulty to empty it. Have you had similar indications or complaints from consumers regarding the packaging size or the ability to empty it completely?

What percentage of food waste reduction do you think would be sufficient for the consumer?

Pricing

Do you think that the consumers would be willing to pay more for value added packaging properties?

What is the percentage range that you think can be charged more for an environmental friendly packaging?

A lot of consumers make price driven choices in the products they buy. Do you think this added feature will influence them at the point of purchase?

Do you think environmental friendly products are considered premium and if not, how can the consumer's perception be changed about it?

Some studies show that if consumers choose to buy green or value added products (which are more expensive than the regular ones), they may not be able to purchase the same amount of products as they used to do. Do you share this thought?

Development Cost

There is always a development cost for new product or packaging projects. The question that usually arises is who is supposed to pay for that: packaging companies, food companies, end-consumer? Could you say something about that?

Further developments

Which are the packaging attributes that you think should be in focus for further development and improvement in order to reduce food waste?

Before finishing the interview, we will mention the main points of the interview and ask the interviewee to add any comments if he/she wants.

The next step will be to prepare the summary and the conclusions from the interview. This will be sent back to the interviewee to review it and we may ask some follow-up questions.