The Barriers and Drivers in Reducing Food Waste within Grocery Stores:
A Case Study

Author:
Naoko Otonari
no222cr@student.lnu.se
19930819
Chanrita Srey
cs223ar@student.lnu.se
19940705
Adam EL KHOUYA ALI
ae223av@student.lnu.se
19940530
Examiner: Monika Müller
Date: 21.07.2016
Tutor: Joachim Timlon
Course code: 2FE29E
Acknowledgments:

This bachelor thesis was written by three international students studying Business Marketing in the third year of Bachelor level. It is the outcome of almost three months research process with the aim of achieving a Bachelor’s degree. The research subject has been freely chosen by the students according to their preferences and interests in the field of Business and Marketing.

It was the authors’ intention to stretch knowledge and research about perceived barriers and drivers on the implementation of strategies to reduce food waste among food retailers, with a particular focus on a grocery store in Sweden, therefore the authors took the opportunity to elaborate on relatively unknown phenomenon within their Bachelor’s thesis.

It is with immense gratefulness that the authors acknowledge as well the support and help of their professor and examiner Monika Müller, as the support of their tutor Joachim Timlon, through the whole elaboration of this thesis. However, the authors would like to express special thanks to the three interviewees, Karin Bildsten, the store manager in Willys store and the head of the logistics manager in Dagab, for their participation and her engagement into the research of this thesis.
Abstract:

The aim of this thesis is to describe perceived barriers and drivers and analyze its impact on the implementation of strategies among food retailers in order to reduce food waste. On supply chain, food retailers are in the powerful position, communicating both consumers and suppliers. Existing literatures and our findings show that food retailers engage mostly in strategies to prevent and re-use food waste.

The methodology used in this thesis is qualitative research through single case study design in order to gain valuable insights from food retailers and develop the existing theories. The empirical date is collected through semi-structured interviews with a store manager, the head of logistics and a project manager and environmental ambassador, Karin Bildsten.

The findings had formed several learning points. First, in this case the major barrier is lack of resources in financial and knowledge terms in order to implement strategies. Second, consumers have a strong impact on the implementation of strategies, playing both as drivers and barriers. Lastly, environmental consideration of employees is a strong driver as well as positive response from society toward implementing different strategies.

This research intended to give inspiration to other researchers into this new field of research. The authors concluded with practical recommendations to food retailers as well as some advices to different stakeholders.

Keywords:
Food waste, sustainability, barriers, drivers, retailing stores / food retailers, prevention, re-use, waste management
# Table of Contents

1. Introduction.................................................................................................................. 5
   1.1 Background ............................................................................................................. 5
   1.2 Problem Discussion ............................................................................................... 7
   1.3 Purpose .................................................................................................................... 8

2. Literature review.......................................................................................................... 9
   2.1 Barriers and drivers ............................................................................................... 9
   2.2 Strategies to reduce food waste ............................................................................ 12
   2.3 Frame of reference ............................................................................................... 17

3. Method.......................................................................................................................... 22
   3.1 Qualitative research ............................................................................................. 22
   3.2 Research design .................................................................................................... 22
   3.3 Data sources .......................................................................................................... 23
   3.4 Source Criticism .................................................................................................... 25
   3.5 Data Analysis ......................................................................................................... 25
   3.6 Criteria for evaluating qualitative research ......................................................... 26
   3.7 Ethical considerations ........................................................................................... 28

4. Empirical investigation ............................................................................................... 30
   4.1 Qualitative Data .................................................................................................... 30

5. Analysis ....................................................................................................................... 38

6. Conclusion .................................................................................................................. 44

7. Reference .................................................................................................................... 46

8. Appendix ..................................................................................................................... 53
1. Introduction

The topic of the research is on implementing strategies to reduce food waste among food retailers, with a particular focus on a grocery store in Sweden.

1.1. Background

One-third of food produced for human consumption is lost or wasted globally every year (Lorrayne Ventour, 2016). Approximately 4.1 million tons or 61% of wasted food is avoidable, and still edible food whereas the rest are the truly unavoidable food waste like meat carcasses and teabags or vegetable peelings (Lorrayne Ventour, 2016). Food waste occurs when there is, “Food which was originally produced for human consumption but then was discarded or was not consumed by humans” (Thyberg & Tonjes, 2016, p.111). Food waste is generated more in developed countries than developing countries per capita (Priefer et al, 2015). The estimated food waste in Europe and North America is about 95-115 kg per year per person while it is 6-11 kg per year per person in Sub-Saharan Africa and South/Southeast Asia (Priefer et al, 2015). These figures demonstrates the impact of food waste on problems that society is facing, such as resource conservation, food security as well as the need to feed the increasing world population (Thyberg & Tonjes, 2016). Thus, in most of European countries, the governments set policies as a part of their objectives in order to minimize food waste (Priefer et al, 2015).

The issue of food waste is crucial due to its significant influence on different fields of these human activities. There are three main impacts of food waste on our lives, namely the environment, society and economy, these impacts are why, due to its significant influence on different fields of these problems, the issue of food waste is crucial.

In an environmental point of view, lost and wasted food has a strong impact on climate change, biodiversity, land but also water pollution. Unfortunately it appears at a rigid environmental price, as water and land quality and biodiversity are affected (FAO, 2013). The Food and Agriculture Organization of United Nations (FAO) mentioned, “In 2007, the global carbon footprint, excluding land use change, of food waste has been estimated at 3.3 Gionnes of CO2eq. This amount is more than twice the total GHG emissions of all USA road transportation in 2010” (FAO, 2013, P) Food waste, especially the food which is not consumed, contributes to
biodiversity loss through habitat and climate change, overexploitation and pollution. For instance, the 9.7 million hectares that are deforested annually to grow food represent almost 74% of total annual deforestation (FAO, 2013).

Furthermore, the economic impact of food waste is also significant. A German researcher stated that many organizations argue that reducing food waste and food loss not only have beneficial environmental effects but also increase the efficiency of resources (Ulrich Koester, 2014). However, the economic impact of food waste could be seen as “the value that is lost with waste” which refers to the production cost and the market price of the food (Buchner et al, 2012). Therefore the act of wasting food indicates the waste of resources used to produce these food (Buchner et al, 2012).

In addition, the social impact of food waste is also significant. FAO has reported that over 800 millions people are affected by the food poverty issue. They are not able to reach the healthy lives due to the lack of required daily calories (FAO, 2014). While a lot of people do not have enough of the daily needed nutrition, a different waste of food occurs in another part of the world (FAO, 2014). A study illustrated that some supermarket retailers throw the food straight into the waste stream instead of providing substandard products to individuals affected by food insecurity (Finn, 2014). The organizations continued by saying that although some efforts are made in feeding the hungry, huge amounts of people are still suffering (FAO, 2014).

As the food supply chain is getting complicated and more actors are becoming involved in the stream due to the globalized market, the importance of tackling the issues of food waste as a whole in the supply chain has been stressed. On the waste stream in the supply chain, food retailers play an important role in order to reduce food waste since they are dedicated to many business activities such as transit and product packaging, point of sale packaging, labeling as well as price signals to customers (Peter et al, 2008). Such activities might lead to generate waste which has an economic as well as an environmental impact (Peter et al, 2008). In other word, food retailers are quite crucial since they are the ones who communicate with both consumers and suppliers and can potentially make a great use of their position in order to ensure that their in-store promotional campaigns and packaging are not generating waste (Retailers shouldn't carry the food into the waste stream, they should provide substandard products to individuals affected by food insecurity).
the blame for food waste, says BRC, 2015). In addition, the stakeholders have been putting more emphasis on retailers’ sustainability practices, which will be a driver which motivate food retailers to further manage waste (Chkanikova & Mont, 2015). In response to new regulations and initiatives set by the governments and institutions of the respective food retailers, reducing waste management has been an important focus in the business for food retailers (Hamilton et al, 2015). The food retail industry includes different types of stores and outlets involved in dealing in a wide range of products to consumers (FAO, 2009). As mentioned at the beginning, physical grocery stores are the scope of interest in this research.

1.2. Problem Discussion
This movement of reducing food waste and minimizing its negative impacts is putting a strong pressure on food retailers to reduce food waste since the governments have realized the powerful position of the food retailers in supply chain (Peter et al, 2008). However two main issues have been identified as the barriers to implementing the food waste reduction in retailer level.

First of all, the lack of resources decreases the chance grocery store set the food waste strategies. Resources are the primary requirements of firms to develop their internal capability (Johnson et al, 2014). Companies’ resources can be in term of tangible and intangible resources (Johnson et al, 2014). For instance, the knowledge, skills and know-how are known intangible whereas merchandises and financial resource are known as tangible (Johnson et al, 2014). In their research, Zhu and Sarkis (2004) found out that there are numbers of companies in the food industry have attempted to operate the green practices, however most of them lack of the skills and experiences. To develop the internal capabilities, industries are demanded to invest in improving the knowledge (Johnson et al, 2014). This demand leads to the requirement of financial resources. Ageron et al (2012) argued that as a result of financial constraints and the high cost of operating, firms are struggling to implement their green strategies.

The second main problem is lack of support from the stakeholders. The external force can be the driver to develop the internal competencies (Johnson et al, 2014). Nonetheless, insufficient supports are the obstacles. The inappropriate regulations and lack of incentives from the government limit the opportunity to involve in the practice (Brewer and Speh, 2001). Some of the
inflexible environmental regulations turn out to be the restraints of the initial intention of the companies to be environmental-friendly companies (Porter & van der Linde, 1995). Moreover, due the high price of sustainable operation, the products or services might be more expensive. Thus, grocery stores are facing the risk of losing price-conscious customers (Brewer and Speh, 2001).

Up until today, the literatures on food waste have mostly focused on investigating the total food lost throughout supply chain, not specially on retailing stage, and therefore, academic research on food waste among retailers are relatively limited (Cicatiello et al, 2016). Also, there are barriers to develop the strategies as mentioned above. In order to find out the solution to increase the chance grocery stores implement food waste reduction strategies, this thesis is going to investigate on what are the strategies of reducing food waste in grocery stores and what the barrier and drivers to each individual strategies. So the research question comes down to;

What do food retailers perceive as barriers and drivers in order to reduce food waste?
In which way do barriers and drivers impact on the implementation of the strategies?

1.3. Purpose

The purpose of this research is to describe barriers and drivers and analyze that impact on the implementation of strategies to prevent and reuse food waste among grocery stores.
2. Literature review

In this section, relevant literatures are presented in order to have deeper theoretical understandings on the topic and determined theoretical frameworks for this research.

According to Jonhson et al:

“In strategy, therefore, it is always important to look inside organizations [...] Externally, organizations are surrounded by important relationships, for example with suppliers, customers, alliance partners, regulators and investors. [...] Strategy therefore is also crucially concerned with an organization’s external boundaries: in other words, questions about what to include within the organization and how to manage important relationships with what is kept outside.” (2014, p7)

Based on the sentence above, the researchers illustrate that to implement a strategy it is required to analyze the internal resources and the external environment. Thus, the two conditions are either (both) barriers or drivers. To consider the internal resources or the external environment as a barrier or a driver depends on each individual organizations define based on their resources.

2.1. Barriers and drivers

There are few articles which generally state the classification for drivers and barriers regarding to the issue of food waste. Thus, the authors categorize those based on a classification used in the articles by Chkanikova et al, (2015), where they provide a systematic overview of the drivers and barriers for food retailers to sustainable food retailing. Since sustainable food retailing includes strategies relevant to reducing food waste and their classification covers a wide range of problems, the authors have decided to use it; namely regulation, resource, market, society.

Regulation

Regulatory factors have a close relationship with policies and regulations from national and international governments (Chkanikova et al, 2015). Bates & Phillips (1999) described the benefits of reducing food waste for food and drink sector from both environmental and financial aspects. In their research, they argue that the governments can encourage companies to minimize
food waste by introducing penalties and incentives. They stressed that the regulations on food waste are likely to be stricter in the near future, and therefore consideration on legal aspects would be crucial for food retailers.

Stuart (2009) investigated on the causes of food waste and possible solutions for reducing food waste with special focus on industrial level. He mentioned as an example of government penalties that imposing landfill tax depending on the amount of food waste is one way to motivate food retailer to avoid wasting. Since financial resource is the one of the major concerns of food retailers, lack of support system from the government would be a barrier for them.

Resources

Resource can be tangible and intangible assets a company has to achieve their objectives (Hughes et al, 2012). In order to tackle the issue of food waste, food retailers are required to have sufficient resource. In the same research, Bates & Phillips (1999) stressed that financial consideration is a major factor which significantly influences on implementation of different strategies. It is also argues that one of the measures for the efficiency among food retailers depends on the amount of waste they produce (Bates & Phillips, 1999). Thus, Bates and Phillips (1999) emphasized that companies can be cost-effective by either reducing the amount of waste or recycling.

As barriers and drivers in resource term, Chkanikova et al (2015) also argue that cost of implementation of the strategies to reduce food waste is the most significant barriers for food retailers. In turn, cost saving can be a driver for food retailers, which comes from the implementation of efficient business operation (Chkanikova et al, 2015).

Baharum & Pitt (2010) have researched on waste management in UK shopping centre sector in order to collect existing waste minimization program. As intangible assets, they mentioned that professional knowledge of food waste may lead companies to reduce food waste and increase monetary benefits. Thus, as Chkanikova et al., (2015) mentioned, lack of expertise on sustainable practice also hinders retailers to conduct different strategies.
Market
Markets factors refer to demands, competitive landscape and industrial norms established by market actors such as customers, competitors and industrial association. The study by Kouwenhoven et al., (2012) emphasized that food retailers found an opportunity to increase their performance by quickly responding to consumer demand. Consumer demands for fresh products are comparatively higher than other types of products, which will be a driver for food retailers to have a variety of fresh food in order to attract more consumers. However, he mentioned that consumers’ interest in product quality attribute would be a barrier for food retailers. Finn (2014) proposes 10 opportunities created by improving innovation and collaboration in order to reduce food waste. He argues that food retailers intend to meet consumer demands with fully stocked shelf at their stores all the time and majority of them put an emphasis on beautifully displayed items on their shelf having rigorous quality standard. As a result, food retailers order food products more than needed and throw away inferior food in quality even though they are still edible.

Society
Social factors refer to pressure from actors such as society, NGO and media. In their research, Bates and Phillips (1999) argues that there are lots of different benefits for food retailers to take food minimization program in their business, one of which is that reducing food waste allows food retailers to increase the environmental image of a company to local community. Chkanikova et al, (2015) argue that there is increased interest in ethical behavior and Corporate Social Responsibility (CSR) from the general public in recent years. In addition, pressure from NGO movement toward food waste and negative publicity on socially irresponsible behaviors in media would also be drivers for food retailers (Chkanikova et al, 2015). On the other hand, they mentioned that not all consumers are interested in or aware of the environmental and social impacts of food, which is barrier for food retailers to take sustainable strategy.

Chkanikova et al. (2015) have concluded that barriers and drivers to implement the strategies and its impacts largely depend to the large extend on the local context. In addition, there is a fine line between drivers and barriers and it depends on how retailers perceive them (Chkanikova et al, 2015).
2.2. Strategies to reduce food waste


“The determination of the long-run goals and objectives of an enterprise and the adaptation of courses of action and the allocation of resource necessary for carrying out these goals.” (2014, p 4)

As mentioned in the introduction retailers have a potential power to reduce huge amounts of food waste in the retailer level. Nonetheless up until now there is a lack of research specifically on food retailer’s model and strategies to handle the problem efficiently. The existing studies in this area are providing either waste reduction model in general or food waste reduction for a whole supply chain. To identify factors that can be barriers and drivers to reducing food waste in this level of food supply chain, the techniques are collected specifically for grocery stores. With this intention first the authors are going to account for three different journals regarding food waste reductions’ guidance. Later the argument of the choice is presented.

The earlier study on waste management in the food and drink industry was in 1999 by Bates and Phillips. The aim of the study is to encourage the industries to implement the waste minimization. Their research, *Sustainable waste management in the food and drink industry*, defines what waste is, describes the waste management hierarchy as well as illustrates the benefits of practicing waste management. Along with the waste management hierarchy, it is given suggestions on how the industry can dominate the waste. On the top of the hierarchy the industries are suggested to eliminate waste which is literally means to not generating any waste. It is revealed to be the most effective way among the options in the hierarchy however it’s admitted as an unrealistic expectation. Next, the researchers propose giving the primary priority to reduce or minimize the waste at source. In addition, the firms also boost to reuse old objects so that they are not wasted. The next recommendation is recovery. This stage waste materials should be recycled, sent to the composting site or generated energy namely biogas. Disposal, the last option in the hierarchy, is the less preferable option where waste is sent to landfill or incineration. This ancient hierarchy is a guideline that is giving only what the industries can do yet it doesn't show how they can do it to
reach the objectives. Moreover although the study nails down to food and drink industries, it does not mainly focus particularly on food waste nor grocery stores. Thus, the research is not suitable for this thesis.

Around the topic of waste management, the Journal of Cleaner Production published a research on waste management focusing more explicitly on food waste. The research conducted by Papargyropoulou et al (2014) introduced a food waste management model as well as providing a number of techniques to reach the objective of each individual stages in the food waste management model. The model consists of five stages, which are Prevention, Prepare for re-use, Recycle, Recovery and Disposal. The most desirable technique is placed on the top of the triangle while the less desirable one is placed at the very bottom of the triangle. The prevention stage, the most desirable technique, responsible actors in the supply chain is guided to avoid oversupply and reduces food that cannot be sold. To avoid oversupply, Mena et al (2010) illustrate that it can be done by collaborative forecasting. To reduce the quantity of food waste in this stage the authors suggested a number of methods such as “improved food labeling, [...], as well as technological improvements in packaging and improving shelf life for perishable foods” (p, 113). The author stated that raising awareness of the food waste to consumers is also one of the effectives techniques. With the food waste after first stage applied, are recommended to re-use for human consumption. This can be done by giving food away to charities or directly to people who are affected by food poverty. Next step, recycle, food waste can be used to feed animal and sent to compost site. Then in the recovery stage the food waste can be converted to energy, which is called biogas. Lastly, the food waste after all the previous stages will be sent to dumpsters. Different from the research above, this research provides the options and techniques of how to reduce waste precisely on food waste at each individual stage. Yet it is not clearly stated which actors in the supply chain have a control over the suggested methods. This fit-to-all guideline makes it hard for the authors to identify what are recommended for grocery stores. Based on grocery stores business activities, the authors can demonstrate that the recycling by feeding animal and sending to compost site is not referring to grocery stores. They are also not the actor who send waste to the dumpster. Whereas it’s a responsibility of trash company. Therefore recycle, recovery and disposal stage, which are out of grocery stores’ control, are not be discussed in the next section.
The recent research from Cicatiello et al (2016) is used food retailers as the main focus. In their study, they mentioned various analysts namely Gustavsson et al (2011), Stuart (2009), Ziegler and Floros (2011), Choudhury (2006), Segrè & Falasconi (2011), Parfitt et al (2010) and their numerous methods of reducing food waste in food retailer. The suggested methods are classified by the types of waste. Since the authors in this thesis do not interest the types of waste, only the techniques will be mentioned in this section. The study provided various choices such as “Markets for sub-standard products”, “Greater public awareness through education”, “Investment in infrastructure and transportation”, “Research on consumer preferences” and “Direct sale to consumers”. The study by Mena et al (2010) also suggests food retailer to have “Investment in infrastructure and transportation” as a strategies to prevent food waste. This investigation allows the authors to employ the most part of it. The suggested techniques will be classified into different steps such as, prevention and reuse in order to link between the techniques and the purpose of doing it: prevent and reuse.

To get a better set of strategies for grocery store, the authors are going to collect all the relevant methods from all the articles mentioned above. Those strategies will be presented in the table below and described in the next section.
Table 1: Strategies for retailers to reduce food waste, Source: self-made by the authors

<table>
<thead>
<tr>
<th>Options</th>
<th>Strategies</th>
<th>References</th>
</tr>
</thead>
</table>
| Prevention | • Raising awareness of food waste to customers  
• Avoiding oversupply  
  o Collaborative forecasting  
• Improving food labeling  
• Improving shelf-life  
• Invest in infrastructure and transportation | Papargypoulou et al, 2014; Gustavsson et al, 2011  
Papargypoulou et al, 2014  
Mena et al, 2010  
Papargypoulou et al, 2014  
Papargypoulou et al, 2014  
Ziegler and Floros, 2011; Choudhury, 2006; Mena et al, 2010 |
| Re-use | • Markets for sub-standard products  
• Giving food away to charity | Segrè & Falasconi, 2011; Parfitt et al, 2010  
Papargypoulou et al, 2014 |

Raising awareness of food waste to customers
Consumers have a strong impact on the amount of food waste produced by retailers (Thi et al, 2015). A research shows that consumer interest and awareness of sustainability issues are quite low (Chkanikova et al, 2015). Thus, the studies demonstrate that raising awareness of food waste to consumers is one of the potential methods to avoid food from wasting (Papargypoulou et al, 2014; Gustavsson et al, 2011). Raising public awareness and informing politicians, authorities, social workers and companies with respect to food waste can be achieved by using some methods such as publishing guideline (Schneider, 2013).

Avoiding oversupply
Finn (2014) argues that food retailers intend to meet consumer demands with fully stocked shelf at stores all the time. Stuart (2009) advises that the research on consumer preferences allows food retailers to determine accurately the amount of food needed as well as the products preferred. In addition Mena et al (2010), who investigated on the cause of food waste in the supplier and
retailer interface, argue that collaborative forecasting and software delivers more accurate forecasts.

**Improving food labeling**

There are different ways to provide consumers with information on the durability of food products, such as “used-by”, “sell-by” and “best before” (Lipinski et al, 2013). Thus, Consumer’s confusion over date labels results in vast amount of food waste (Finn, 2014). The researchers found out that improving food labeling is another technique to prevent food waste (Papargypoulou et al, 2014). Lipinski et al (2013) suggest retailers to change the date that appears on the packaging and how it is displayed in order to reduce the confusion around the date labeling. Further, food retailers can tackle the date-related food waste by educating consumers by posting in-store display, giving a leaflet and a guideline both in store and on the company websites.

**Having technology to improve shelf-life**

Shelf life refers to the length of time in which food products are stored with a satisfactory quality (Xiaojun & Dong 2012). Food products, which have short-shelf life such as fruit, vegetable, and meat, cause the inefficiency due to its perishability (Kouwenhoven et al, 2012). Eriksson et al. (2014) argues that having longer shelf life contributes to reduce food waste. Adding to the existing technology, Radio Frequency Identification (RFID) enables food retailers track stock in the entire supply chain, which leads them to efficiently manage the balance between demand and supply as well as stocks (Stuart, 2009).

**Investing in infrastructure and transportation**

The same suggest as other researchers, Ziegler and Floros (2011); Choudhury (2006), Mena et al (2010) revealed that there is often a problem with vehicles delivering the products directly to supermarket, which makes it difficult for food retailers to maintain fresh food. Thus, improving in infrastructure and transportation are required in order to have longer shelf life and also not to damage the products. Based on the empirical data of their study from the food industry, Mena et al (2010) found out that in order to manage the shelf life efficiently, some retailers vertically integrate with their suppliers, which helps to shorten lead times.
Markets for sub-standard products

The substandard products do not mean they are lack of hygiene or nutrition; instead those products are the visually inferiors to other products (Hyde et al, 2001). These inferior food in retailer stores are classified by 4 categories namely damaged packaging (packaging closed), unsuitable quality, misshapen products (misshapen pack), and unpurchased products which are able to be consumed by human (Ciatiello et al, 2015). One way suggested by several authors is to sell sub-standard products with lower price (Parfitt et al, 2010; Segrè & Falasconi, 2011; Stuart, 2009).

Giving food away to charity

Another possibility to deal with this problem is to donate the foods to people who are affected by food poverty through organizations or charities such as food bank and church (Papargypoulou et al, 2014). Donating food waste allows food retailers to save people in need, as well as contribute to minimize the negative impact on environments (Schneider, 2013). For example, European food bank donated food products to 31,000 social organizations in 2011 and support approximately 5.2 million people by those goods (Schneider, 2013).

2.3 Frame of reference

In this section, the authors have intended to link each strategy and its barriers and drives based on the discussion of previous section. At the end, the authors have placed a table which includes those strategies and associated barriers and drivers for the sake clarity.

Raising the awareness of food waste to customers

A research shows that consumer interest and awareness of sustainability issues are not sufficient enough to persuade food retailers in order to implement sustainability practices in their business. However, stakeholders have been paying attention to food retailer’s sustainable practice since it is directly related to their return (Chkanikova et al, 2015), and therefore making efforts to raise consumer is a driver for a company to gain attention from the stakeholders, as well as increase their environmental image on local community (Bates & Phillips, 1999).
**Avoiding oversupply**

As mentioned above, food retailers intend to meet consumer demands with fully stocked shelf at their stores all the time, which makes it difficult for them to avoid over supplying due to unpredictable consumer demands. Oversupply can be avoided through collaborative forecasting or developing the information technology. However, both ways required food retailers to have financial resource as well as expertise to implement (Chkanikova et al, 2015), which would be a barrier for food retailers.

**Improving food labeling.**

It is said that consumer’s confusion over date labels results in vast amount of food waste (Finn, 2016). The current EU labeling legislation set a goal to improve consumer understanding of labeling, which would be a driver for food retailers (Rahelu, 2016). However, lack of a harmonised approach to labeling is barriers to improving labeling due to the customers’ confusion over a variety of certification scheme (Chkanikova et al, 2015).

**Improving shelf-life**

Food products that have short-shelf life such as fruit, vegetable, and meat cause the inefficiency due to its perishability (Kouwenhoven et al, 2012). However, consumer demands for those fresh products are comparatively higher than other types of products, and therefore having a variety of fresh food is crucial to attract more consumers (Kouwenhoven et al, 2012), which will be a driver for food retailers. In order to manage the shelf-life efficiently, some retailers vertically integrate with their suppliers, which helps to shorten lead times (Mena et al, 2010). However, financial resource is necessary in order to collaborate with actors on the upper stream in supply chain (Stuart, 2009).

**Investing in infrastructure and transportation**

One of the barriers for this strategy is lack of financial resource to invest in logistics and infrastructure (Kouwenhoven et al, 2012). In fact, some research argued that it is quite costly for food retailers to invest on the upper stream in supply chain, which is essential to have longer shelf life and also not to damage the products. Thus, cost saving which comes from the implementation of efficient business operation can be a driver for food retailers (Chkanikova et al, 2015). For example, investing logistics would decrease the number of damaged packaging.
Markets for sub-standard products

Consumers’ interest in product quality attribute would be a barrier for food retailers since majority of them put an emphasis on beautifully displayed items on their shelf. In addition, laboring cost and time which is required food retailers to sell those inferior products are a barrier, and therefore food retailers end up wasting food instead (Stuart, 2009). Regulations and overly rigorous quality standards on size and shape, which is related to consumers’ demand for perfect produce, leads food retailers to generate tons of food waste (Finn, 2014). As a result, food retailers throw away inferior food in quality even though they are still edible (Thyberg & Tonjes, 2016). In other word, this strategy leads food retailers to save their cost due to decreased waste generations (Kouwenhoven et al, 2012).

Giving food away to charity.

Donating food also allows food retailers to save their cost due to decreased waste generations (Kouwenhoven et al, 2012). In their research, Cicatiello et al (2016) found out that food recovery project, in which food retailers donate their food to the charity, a return can be estimated 4 times larger than the cost associated to initiate the project. In addition, Stuart (2009) argues that food waste donation to the charity is strongly associated with positive corporate social responsibility. However, dealing with the donations required food retailers to take huge amount of time as well as labors (Schneider, 2013). In addition, food safety regulations prevent food retailers from donating activity. Further, some food retailers find donation arrangements quite complicated, only to dispose food once it approaches expiration date (Finn, 2014). Schneider (2013) argues that guideline regarding legal aspects of food donations helps food retailers to cooperate with social organizations.

In addition to barriers and drivers associated with each strategy, implementation of any strategy required food retailers to have sufficient resource, which is a barrier to them (Bates & Phillips, 1999). Also, the governments can encourage companies to minimize food waste by introducing penalties and incentives (Bates & Phillips, 1999), and therefore government can motivate food retailers to implement every strategy.
Table 2: Frame of reference, source: self-made by the authors

<table>
<thead>
<tr>
<th>Stages</th>
<th>Strategies</th>
<th>Barriers</th>
<th>Drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevent</td>
<td>Raising awareness of food waste to customers</td>
<td>Resource Lack of resource</td>
<td>Regulation Government incentives</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Society Increase environmental image</td>
</tr>
<tr>
<td>Avoiding oversupply</td>
<td></td>
<td>Resource Lack of resource</td>
<td>Regulation Government incentives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Market Consumer demands for fully-stocked shelf</td>
<td></td>
</tr>
<tr>
<td>Improving food labeling</td>
<td></td>
<td>Regulation Regulation on food labeling</td>
<td>Regulation Pressure from the government</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resource Lack of resource</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Market Lack of harmonized approach in industry</td>
<td></td>
</tr>
<tr>
<td>Improving shelf-life</td>
<td></td>
<td>Resource Lack of resource</td>
<td>Regulation Government incentives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Market Consumer demands for fresh products</td>
<td></td>
</tr>
<tr>
<td>Investing in infrastructure and transportation</td>
<td></td>
<td>Resource Lack of resource</td>
<td>Regulation Government incentives</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Resource Cost –saving</td>
</tr>
<tr>
<td>Re-use</td>
<td>Markets for sub-standard products</td>
<td>Regulation Quality standard</td>
<td>Regulation Government incentives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resource Laboring cost</td>
<td></td>
</tr>
<tr>
<td>Giving food away to charity</td>
<td>Market</td>
<td>Resource</td>
<td></td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consumer demands for product quality attributes</td>
<td>Cost-saving</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regulation</td>
<td>Complex donation arrangement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Resource</td>
<td>Time and labors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Regulation</td>
<td>Government incentives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Resource</td>
<td>Cost-saving</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Society</td>
<td>Increase environmental image on the public</td>
<td></td>
</tr>
</tbody>
</table>
3. Method

This chapter aims to explain the research process and methodological concepts used for this research. The method used in this thesis will be justified in order to tell the readers a clear view on how data was collected and analyzed.

3.1. Qualitative research

In order to accomplish the purpose and answer research questions, the authors use qualitative research in this thesis. Qualitative research usually “emphasizes words rather than quantification in the collection and analysis of data” (Bryman & Bell, 2011). In this study the authors aim to describe perceived barriers and drivers for food retailers and analyze its impact on implementation of the strategies to prevent and reuse food waste, and therefore, qualitative research is the most appropriate for this thesis due to the focus on gaining insight from the food retailer on how different barriers and drivers impact on them.

In order to approach qualitative research, the authors have chosen abduction, which is described as a theory development by Dubois and Gadde (2002). This approach is often used in case study with the fact that it allows researchers to deal with empirical data collected in more flexible way. In abduction, the researchers “constantly going back and forth from one type of research activity to another and between empirical observation and theory” (Dubois and Gadde, 2002, p 555). This enables researchers to deepen the understanding of both theory and empirical data. In other word, abduction approaches allows researchers to develop theory based on the empirical data by adding assumption to the existing theoretical model (Dubois and Gadde, 2002). In this research, abduction is quite appropriate since it enables us to achieve the purpose of this research. The authors have give theoretical answer to the research question in frame of reference based on intensive literature review and collected the empirical data through interviews. Those empirical data helps the authors to gain valuable insight from an interviewee and analyze those data in relation with theories, which will contribute to develop the current theoretical framework.

3.2. Research design

“Research design provides a framework for the collection and analysis of data” (Bryman & Bell, 2011, p 40). The research design is usually chosen in order to determine a broad range of
dimensions of the research process, which includes such things as expressing causal relationship between two variables and having a temporal understanding of social phenomena and their interconnections (Bryman & Bell, 2011).

With the fact that the authors have shown different barriers and drivers for retailing store and its strong relationship with individual retailing store and the local context, the authors have chosen to conduct a single case study research design. The case study research design “entails the detailed and intensive analysis of a single case” (Bryman & Bell, 2011, p 40). Several researchers point out the limitation of single-case studies due to the lack of strong base for theory building. However, the purpose of this research is to generate an in depth analysis and add assumptions to theory. In addition, according to Yin (2009), single-case study is rational when the research aims “to capture the circumstances and conditions of an everyday or commonplace situation” (Yin, 2009, p 48). Thus, as Siggelkow (2007) emphasized, single-case studies can richly describe the existence of a phenomenon.

One of the large retailing stores has chosen for this thesis by theoretical sampling. Theoretical sampling simply means the researchers select a particular case since it is appropriate for illuminating and extending relationships and logic among constructs (Eisenhardt & Graebner, 2007). Theoretical sampling is suitable for this research considering the purpose, which aims to develop theory, not to test them. Thus, the authors are required to choose the case which meets two criteria, one of which is to be grocery store actively operating in Sweden since perspectives of retailing store depends on a particular local context. Also, it is easier to reach retailing store because of the fact the authors are also physically located in Sweden. The other criterion is to be making effort to reduce food waste in their store.

3.3. Data sources
To answer the research questions, the author collect qualitative data from different sources. There are four types of qualitative data: qualitative observation, qualitative documents, qualitative interviews and qualitative audio and visual materials (Creswell, 2014). These can be categorized into two data sources, namely primary data and secondary data.
**Primary Data**

Primary data is defined as data, which is collected by a researcher for the purpose of a particular research. In qualitative research, primary data can be collected through interviews, Participant observation and focus group (Bryman & Bell, 2011). In this research, the authors have chosen to collect primary data through interviews considering the purpose of the thesis and making use of case study design.

Interview is perceived as “[…] a systematic conversation initiated for a specific purpose and focused on certain planned content areas, it is not a simple two-way conversation between an investigator and an informant” (Appannaiah et al., 2010, p.108). The qualitative interview can be conducted by face-to-face interview, telephone interview and focus group (Creswell, 2014). The focus group is not employed in this study due to the nature of focus group is involving “with six to eight interviewees in each group” (Creswell, 2014) which make it difficult for interviewees to gather together. Plus the study does not necessitate the idea of the group. Instead, the response from the person in charge of the concerning field is sufficient. Thus, the face-to-face interview is applied. However the telephone interview may replace the face-to-face interview in case the interviewees ask for.

According to Bryman and Bell (2011), there are two forms of qualitative interview namely unstructured interview and semi-structured interview. They differentiate the unstructured and semi-structured as the unstructured interview is very similar to the character of a conversation (Burgess, 1994, cited at Bryman & Bell, 2011). In the semi-structured interview, interviewers have a list of questions on fairly specific subjects, and those questions are picked up depending on the flow of the interview and things what interviewees said (Bryman & Bell, 2011). The authors have decided to use semi-structured interview due to the fact that it is quite flexible and advantages of both structured and unstructured interviews can be enjoyed.

**Secondary data**

Secondary data refers to data, which is collected by other researchers for a particular purpose of a research. It can be reached through internal report, newspaper, academic journal or company.
websites (Bryman & Bell, 2011). Collection relevant documents both prior and during primary data collection is incredibly useful for the study (Yin, 2014). The advantages of secondary data collection are that it is less-time consuming and easier to reach compared to primary data. The authors have already collected secondary data from scientific journals, websites and books in order to deepen our understanding on background of the problem and formulate the purpose of this research. In addition, the company official websites and the latest version of sustainable report are looked carefully on to gather relevant information to this research.

3.4. Source Criticism
As previously mentioned, the authors have utilized different sources for this thesis. The primary data is collected from interview with chosen company. The secondary data is collected from academic journals, websites and books, which the authors should pay careful attention to in order to ensure the quality of the data. According to Bryman and Bell (2015), there are four criteria the authors used in order to assess the quality of secondary data. Those are as follows;

• Authenticity - Is the evidence genuine and of unquestionable origin?
• Credibility - Is the evidence free from error and distortion?
• Representativeness - Is the evidence typical of its kind, and, if not, is the extent of its untypically known?
• Meaning - Is the evidence clear and comprehensible?

Keeping these criteria in mind, the authors analyzed the sources of data used for this thesis. Information taken from individual blogs or the private organization might not be objective and present data in quite subjective way since they seek to gain attention from the public with exaggeration. Further, academic articles should be read critically since often those are not targeted at all, but limited to a specific audience.

3.5. Data analysis
In this chapter, the data, which is already presented in literature review, will be analyzed. Based on John W. Tukey, a statistician, defined data analysis in his book “The Future of Data Analysis“ published in 1961 as a “Procedures for analyzing data, techniques for interpreting the
results of such procedures, ways of planning the gathering of data to make its analysis easier, more precise or more accurate, which apply to analyzing data” (John W. Tukey, 1961, p 2).

Indeed, data analysis represents a process for obtaining pure raw data and converting it into useful information for decision-making by users. The authors have collected qualitative data from interview with the chosen food retailer, AXfood, and academic journals, websites, books and annuals reports, and analyzed them to answer questions, test hypothesis or disapprove theories.

These collected data are analyzed with the assistance of grounded theory, which, based on Strauss and Corbin (1998), has been defined as a theory “that was derived from data, systematically gathered and analyzed through the research process” (Strauss & Corbin 1998: 12, p 576). Despite the approach is followed varies from study to study, the grounded theory probably represents the most influential general strategy and probably the most prominent approaches for conducting qualitative data analysis (Bryman & Bell, 2015, p 584).

In qualitative data analysis, grounded theory implies several tools to be applied: the data analysis plan. We can distinguished some important stages that must have had as the following:

- The first step of grounded theory, seen as the key process of grounded theory, is coding, in which data are divided as components parts (Bryman & Bell, 2011).
- The second step of grounded theory refers to the collection of qualitative data (Bryman & Bell, 2011).
- The last step of grounded theory, namely the constant comparison, is an aspect of this grounded theory that refers to the process of maintaining a close connection between data and conceptualization, in order to do not lost the correspondence between concepts and categories with their indicators (Bryman & Bell, 2011).

In this paper, a content analysis seems to be appropriate because it show a systematic, replicable technique in order to compress many words of text into fewer content categories (Weber, 1990). Beside, through the semi-structured interview to the chosen food retailer Axfoods conducted and their record, the authors were able to gather a large amount of data in terms of words. The results produced through such analysis will be used to answer the thesis questions but also draw conclusions, before answering the empirical research questions.
3.6. Criteria for evaluating qualitative research

The most dominant criteria for the evaluation of business research are reliability and validity (Bryman & Bell, 2011). However, many researchers mentioned that quite different criteria should be used for qualitative research in order to be more concrete and properly evaluate the quality of the qualitative research. Guba (1985) and Guba and Lincoln (1994) proposed two alternative criteria for qualitative research, which are trustworthiness and authenticity. Trustworthiness is composed of four criteria;

- Credibility - Whether there is good match between theoretical idea and researcher's observation
- Transferability - To what extent the finding from the research can be generalized to different social setting
- Dependability - whether the results of a study are repeatable or not.
- Conformability - To what extent it is apparent that researchers do not include the personal values or depend on theoretical ideas inappropriately.

In addition, criteria of authenticity are necessary to concern the political impact of research. Authenticity is made up by five criteria.

- Fairness - Whether the research properly illustrate different perspectives among participants in the research
- Ontological authenticity - Whether the research leads members to a better understanding of their social milieu?
- Educative authenticity - Whether the research enables participants to appreciate better the perspectives of other members of their social setting?
- Catalytic authenticity - Whether the research played as impetus to members to engage in action to make a change in their situation?
- Tactical authenticity. Has the research empowered members to take the steps necessary for engaging in action?

In this research, explaining carefully about our procedure of four different data collection methods, it is possible for other researchers to conduct the same primary data collection for cross-
sectional design which aims to investigate on food retailers in specific area. Also, since there are three members in our group, the authors make sure that everyone understands what interviewees said during qualitative interview by taking note or record video during interview.

Also, The authors review literatures on types of barriers and drivers which have an impact on perspectives of food retailers in food supply in theory part, and collect the data based on them from chosen food retailers to ensure good fit between theories and collected data. Taking the purpose of this paper into consideration, the authors recognize the criticism related to limited generalization since this research is conducted under time constraints and primary date is collected by chosen food retailer.

3.7. Ethical considerations

Knowing that the primary data is collected through interview in this research and the authors have been stayed with close touch with interviewees, the ethical principle used in this research should be clarified in this section.

Diener and Crandall (1978) proposed four areas of ethical principle, which are (1) whether there is a harm to participants (2) whether there is a lack of informed consent (3) whether there is an invasion of privacy and (4) whether deception is involved.

Before conducting interviews, the authors asked interviewees about procedure of interviews and obtain agreements on things such that the authors record the discussion during interview, the name of her position can be appeared on our thesis and the discussion with the interviewees will be analyzed in our thesis. One of the authors have contacted with the interviewees on a daily bases, and therefore the authors regularly ensure if everyone in this group understand the purpose of this research and what interviewees agreed upon.

The authors present the summary of methodological choices for this thesis below for the sake of clarity.
Table 3: Summary of methodological choices for this thesis, Source: self-made by the authors

<table>
<thead>
<tr>
<th>Research strategy</th>
<th>Qualitative research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research design</td>
<td>Single-case-study research design</td>
</tr>
<tr>
<td>Data collection methods</td>
<td>Semi-structured Interview</td>
</tr>
<tr>
<td>Data analysis methods</td>
<td>Grounded theory</td>
</tr>
<tr>
<td>Quality criteria</td>
<td>Trustworthiness / Authenticity</td>
</tr>
</tbody>
</table>
4. Empirical investigation

In this section, background information on chosen grocery stores and empirical data through interviews are presented. In the appendix, the readers will find a table showing empirical questions and answers on barriers and drivers for each strategy.

Axfoods was established in 1964 and are currently operating retail business in Sweden through 194 wholly-owned Willys stores and Hemköp with 68 groups owned and 111 franchise stores. Axfoods are using different business models depending on each store chain. Due to Axfoods wholly own Willys and only 50% of Hemköp’s share, the interviewee has more control over Willys than Hemköp. Therefore, the authors chose Willys for the thesis.

Willys is positioned as Sweden’s leading discount chain (Axfoods sustainability report, 2015). They have been putting an emphasis on providing wide range of assortment and huge proportions of fresh products, attracting price-sensitive consumers. Willys also offers organic products with reasonable price, demonstrating themselves as “Sweden’s cheapest bag of organic groceries”.

The authors got an opportunity to conduct interviews with an employee in Axfoods and another employee in Willys. One of them is Karin, a project manager and environmental ambassador, and the other is a store manager working in Willys store. By interviewing Karin, the authors could see the perspective of a person who implements the strategies. However to see the full picture the thesis had included an interview with a store manager where the strategies are being practiced. In addition, with the fact that Willys does not engage in its logistics, the authors have interviewed with a logistics manager at Dagab, which is Axfoods supply chain organization and providing logistics related service (Axfoods sustainability report, 2015).

4.1 Qualitative Data

In the recent years Axfoods have tried to reduce food waste from its stores. In their sustainability report 2015, they mentioned, “minimizing food waste is one of the Axfoods most important sustainability issues” (Axfoods sustainability report, 2015, p 14). Up until today, Willys has been practicing many strategies in order to reduce food waste, which can be found both in the interviews and sustainability report.
Based on the characteristic of the semi-structure interview general questions were asked to begin the conversation. In each interview, the authors started asking on what role they perceive playing in minimizing food waste. According to Karin, Willys mostly do the food waste prevention and re-use. The store manager mentioned that at his Willys store, they are trying to sort out the garbage before garbage collection so that those garbages would be easily used for generating biogas. However, he agreed with Karin that he is usually more engaged in food waste prevention and re-use in his store.

Following the previous question, the authors asked what they perceived as barriers and drivers in order to implement different strategies. The details of the interview are described as below.

**Raising awareness of food waste to customers**

To reveal the food waste issue to society, as written in the sustainability report of Axfood as well as the response from the interviewees, Willys prints out leaflets with the aim of increasing customers’ attention on the issue. Also several articles were published on the social media account of the company such as Facebook. Furthermore, Willys has started programs what they call “Willys+”, in which the company offers 16 discount each week in addition to the regular offer (Axfoods, 2013). This programs gives customers an idea what to buy for dinner, aiming to seek its consumers to know smarter way to shop at their store in order to reduce food waste (Axfoods, 2013).

In our interview with Karin, the interview went on with questioning the barriers and drivers to this strategy. The answer turned out that the main motivation to implement the strategy is the environmental consideration of the employees themselves. However the issue of food waste was described in the sustainability report one of the recent five trends in Sweden (Axfoods sustainability report, 2015). Later the positive reaction from the society on the firms’ aim to increase the awareness of this issue is identified as another driver since it helps increases the environmental image of the grocery store.

Also, she mentioned the inefficient of printing the flyers due to the fact that it is so easy to be ignored. According to her, the efficient way is talking to customers in person or giving the presentation to kids in schools. Yet in order to do so, it requires a strong budget. In addition raising awareness of food waste to customers is not primarily the responsibility of the grocery
stores. In Sweden, to educate consumers about this issue is the responsibility of National Food Agency (Livsmedelsverket). Willys uses its capability to do what they can help in addition to the government’s actions.

Avoiding oversupply

In the second session, Karin stressed, “The most important point to start from is ordering the right amount of food products and setting the right price, specially fresh products and bread.” In term of avoiding oversupply, Karin mentioned about the automatic order software, which is used to automatically remove items from the stock’s history and notify suppliers when items have been checked out. The supplier will send the numbers of products that have been purchased back to the store before it goes out of stock. Karin said the software is absolutely advantageous. It allows them to avoid wasting food because of not being able to sell overstock food on time. It is estimated that 2% of food are wasted due to oversupply, but with this software the stores have saved a huge amount of food. In addition to automatic order software, the store manager mentioned that when they conduct in-store campaigns or during holiday season, he looks back the past order recording and do an age comparison on each products with computer program, which makes it easier for him to decide how much food product she will place an order, set the price for products on campaign and minimize the food waste.

Regarding the question of which are considered as barriers to avoiding oversupply, Karin answered that the overpriced cost of the software could be a barrier. Moreover during holiday period high customer demand for specific products or foods leads them to order the products or foods more than usual. She continued that it is hard to predict how much foods will be needed because they sometimes start marketing campaigns, which would temporarily increase the customer demand for targeted products. The firm prefers ordering more rather than not having enough products available. Therefore, the high customer demand is a barrier to avoid oversupply.

The store manager also admits that it is quite difficult to predict the correct amount of products that are on campaign due to the temporally increased demand for those products. He emphasized that “We must satisfy our customers and must have products at the shelf every time they visit our store. But we want to sell out all the products we ordered. Those two things should be balanced.”
Improving food labeling

Throughout EU countries, the same labeling legislation has been applied since 2014. This requires food industry to print “used by” date on food products (Nordic Council of Ministers 2014). However, there is no consistent guideline to advise on how to set durability and when to use which type of dates on the packaging, and therefore, there is different national guideline between each EU countries. In Sweden, National Food Agency is giving a guideline to food retailers. In the guideline, “use by” date is defined as the last day of food products are expected to be edible. However, food products with “best before” date can be sold after the expiration date (Nordic Council of Ministers, 2014).

The authors questioned if Willys does labeling. “It is supplier’s task to put the expiration label. Willys doesn’t do that in its stores,” said Karin. Thus, they don’t feel any pressure from the government neither has to worry about the regulation. Instead, they published articles in order to educate consumers about what it means by “best-before” and “used by” in their magazine and providing it in some Willys stores.

Karin mentioned that the lack of knowledge of store managers on food labeling could be a barrier for this strategy. Since majority of them do know the fact that food product labeled “best before” can be sold even after expiration date, they just throw them away at the end. However, the store manager mentioned that he truly understand that products with best before date can be sold even after the date. Yet as a barrier, he emphasized “No one really wants to buy the products after the expiration date.” Since customers do not show the interest to buy food product after its expiration date, he does not sell those food at store. He also motioned that if customers understand that food products with best before date can be edible after the date, there is a possibility that those products can be sold with discounted price.

Yet, when he put food products on sale before the expiration date, he makes it clear to the consumers that those products are a couple days before the expatriation date, putting a label of “Short date to expire” on a package. He continued that this effort could lead the consumers to better understand food laboring. The details on selling substandard products will be explained in the later section of this chapter under marketing sub-standard products.
Improving shelf-life is another strategy to prevent food waste in grocery stores. Karin mentioned that prolong the shelf-life of the fresh products allows them to have more time to get the products sold. The store manager mentioned that in order to improve the shelf-life, he is using different approaches depending on the characteristics of food. For example, Potatoes are better to be stored in darker places to keep them in good condition for a long time.

The same questions about the barriers and drivers to this method were asked to Karin. In the previous year, she attended a few seminars, which were organized by the National Food Agency about the guideline on food storage. She addressed that the government’s interference is a motivation for them to continue their journey of preventing food waste. The second driver was identified as the demand of fresh food from customers. As products stay longer in the stores, Karin claimed that there is the financial benefit, which is also a driver to this strategy. The store manager also mentioned that high consumer demand for fresh products would be a driver for implementing this strategy. Despite drivers, she continues that it costs more to put this strategy into practice and it doesn’t make significantly different.

Investing in infrastructure and transportation

Rather than consider investing in infrastructure and transportation as one independent strategy, Karin sees the method as another way to improve shelf-life of the products. She emphasized that the shorter transportation time, the longer shelf-life.

Further, as explained in the beginning of this section, Willys is working with its subsidiary, Dagab, in order to improve efficiency of logistics. In our interview with the head of logistics in Dagab, he mentioned that they check all the way from distribution center to each Willys store if the inside of their vehicle are always kept 4°C to prevent fresh food from going bad. Dagab delivers food products six days per week, and they invested in logistics software in order to manage efficient routes from distribution center to each Willys store. As a barrier for this strategy, he mentioned that it is always difficult for them to keep the temperature inside the vehicle in summer time and it costs more because of high temperature of outside environment.
Markets for sub-standard products

For this strategy, Willys are lowering price when the expatriation date is approaching and preparing ready-made meals using perishable foods (Axfoods sustainability report, 2015).

What Karin emphasized the most is that reducing negative impact on the environment through decreasing the amount of food waste motivates them to keep working on the issue of food waste. In addition, she said cutting the price and sell products would have positive social impact since customers with low income would afford discounted products. In our interview with Karin, it was found out that neither regulations nor laboring cost prevent them marketing those substandard-products since they are allowed to sell the products even after expiration date under food regulation, and also sticking new labels and packaging are not required much extra time and labor. Another driver would be cost saving. In the interview, Karin has stressed, “We really should put the price down instead of throwing them away. We are going to start an experiment in some Willys stores and sell out bread from our private brand, cutting price down. This is a really big step. Once we succeeded, we are going to do the same experiment with fruits and vegetables.”

In fact, when they cutting prices of products and sell those during opening hour, many consumers rush to those products, which indicated the demand for cheaper products.

On the other hand, Karin mentioned some store managers tend to avoid lowering the price and sell at the store in order to maintain the positive image of the store, placing mostly fresh products at shelves, which is one of the big barriers to reduce food waste. Another barrier she mentioned is consumer demands for high quality products in terms of the visual. Also, the reason why some Willys stores avoid lowering price is because of the lack of education on calculating profit margin. As a result, some store managers simply think that it is better to sell products at full price instead of cutting the price. As she mentioned, Willys has been in testing period recently and some stores start lowering the price and see how consumers react toward it. Once those stores get positive response from consumers, she hopes all the Willys stores begin to implement the strategy in the future.

In our interview with the store manager, he mentioned that he is currently lowering the price for those substandard products at his store. He continued “We are cutting price of food products a couple days before the expiration date, and I think customers consider it as the good opportunity
for them to get a good deal.” The store manager mentioned that he is not concerned that selling substandard products leads them to decrease the positive image of the store because in daily basis he have been receiving positive response from his customers, and even some of them ask store staff if there will be food products with discounted price. He also mentioned that cutting price down and putting new labels on products required them to take a little time as well as extra labors. However, he emphasized that this strategy is worth doing since generating less food waste leads to reduce the negative impact on environment as well as to increase financial benefit for them.

Concerning different types of substandard product, the authors asked if they have a quality standard when they receive food products. He mentioned that he puts pressure on distributer by refusing taking misshapen food or damaged packages, and also those products cannot be sold at full price. Thus, every time a distributor delivers the food products with visually inferior quality, the store manager sends it back to a distribution center.

*Giving food away to the charity*

When it comes to the other strategy of giving food away to the charity, Willys have just started donating since last year, and approximately 20 Willys stores are currently donating food to social organizations. Karin mentioned that the huge barrier for this strategy is lack of transportation and labors, which is necessary to deliver food waste to places where food is hand out to those in need. Thus, it is quite hard to find partners where they can donate food to because they are careful with the choice of the partners, and also those organizations should have enough resource such as tracks and labors to pick up food at stores several times per week. Also, she mentioned that some store managers might be afraid of food hygiene issue since they are not sure if the products they donated to social organization is deliver to people in safe conditions, which might be a barrier for food donation. However none of the problem on food hygiene has been reported since they started donating food.

The store manager also perceived food hygiene issue as barrier. The store manager said he is currently looking for partners that he can donate food waste to. He put an advertisement in a town magazine in order to find a partner, but he is having hard time in finding a trustworthy organization as a partner. He stressed he is very concerned with food hygiene issue since problem on food hygiene would damage the store image as a result.
As a driver, reducing a variety of negative impacts on the environment motivate them to reduce food waste. In response to implementation of those strategies, Karin mentioned that Willys could increase the environmental image on the public and gain lots of supports from the people through social network, which in turn is a strong driver to them. In addition, she mentioned that it is not troublesome to exchange contract document with the donating partners, taking very few time and labors. There is not a guideline on food donation from the government, but Willys had its own version, which helps each store to donate food to the charity.
5. Analysis

This chapter aims to analyze the data collected for this research in 2.3. Frame of reference and in 4. Empirical investigation in order to answer the research questions.

Raising awareness of food waste to customers
Since consumers have a strong impact on the amount of food waste produced by retailers, raising awareness of food waste to customers is one of the effective ways to reduce food waste. According to the frame of reference the stakeholders’ attention on environmental image of firms regarding food waste issue, which is society factor, is a driver to increasing the acknowledgement of customers about food waste. In contrast with the theory, the authors found out the pressure from the stakeholders is not sufficient to implement the strategy. Instead what motivate them to put this strategy into practice is employee’s concern about the environment and the ethical issue on wasting food. As a result, Willys gets huge amount of the positive responses from customers; later encourage them to continue the journey. Although the main driver is not from the society, Willys stated in the sustainability report that food waste issue is one of the five trends which people are paying more attention to in Sweden (Axfoods sustainability report, 2015). The frame of reference shows that financial resource could be a barrier for food retailers to implement this strategy. However, our findings say the cost of publishing the articles is not an obstacle for Willys. Because they are using these platforms for free or different purpose as well, they invest the same budget to run their magazine and social media in the end.

Avoiding oversupply of food
Most studies on food waste suggest that most desirable way to reduce food waste is avoid ordering more than needed and reduce the amount of food that cannot be sold. Several theories suggest that a barrier for this strategy is consumer demands for fully stocked shelf. The authors found out that it is difficult for Willys to predict how much products will be needed since it depends totally on the consumer demand. For instance, during holiday’s period, due to the high customer demand for specific food products, they order those products more than usual. However, utilizing past order recording helps the store manager to decide to order the appropriate amount of food, which can be one of the techniques to overcome the difficulty. Further, Karin has mentioned the automatic ordering software as one of the method to avoid oversupply of food.
According to the interview, Karin found it absolutely advantageous even though the implementation of this software required them to have sufficient financial resource. Cost saving was not mentioned as a driver, but instead she mentions that the implementation of this strategy allows Willys to order the appropriate amount of food products. Thus, it can be said that automatic ordering software and past order recording contributes to prevent food waste and as a result, lead Willys to save their cost by generating less food waste.

*Improving food labeling*

The primary data from the interview demonstrated that Willys stores do not do the label on products. It turns out to be the suppliers’ responsibility. Instead, they published articles in order to educate consumers about what it means by “best-before” and “used by” in their magazine and providing it in some Willys stores.

In addition, our interviews shows that even though store managers have a sufficient knowledge on food labeling, food products after best before date are not on sale due to the low customer demand for those products. As the store manager mentioned, the reason for the low demand could be the lack of knowledge of customers on food laboring. In order to decrease the confusion over food labeling among consumers, Willys is currently providing leaflets to consumers. Improving food labeling would enable consumers to understand the difference between the various food date labels and makes it easier to make a purchase decision on food products a couple days before the expiration date or after the best before date. This could lead them to the success of a strategy of *marketing substandard products*, which is a motivation for them to improve food labeling.

*Improving shelf-life and Investing in transportation and infrastructure*

Shelf life means the length of time in which food products are stored with a good quality. As Kouwenhoven et al (2012) suggested, food products such as fresh vegetables, fruits and meat have a shorter shelf life. Due to the high demand for those fresh products, improving shelf life is quite crucial in order to attract consumers as well as reduce food waste. According to the interview with Karin and the store manager, the crucial motivation for them to improve shelf life is high consumer demand for fresh products as well as government incentives. In addition, Karin mentioned the financial benefit is also the driver since having longer shelf life leads them to save the cost. Also, the store manager mentioned that longer shelf life creates more opportunities to
sell food products at full price, which is another financial benefits that they could receive by implementing this strategy.

Interestingly, in our interview with Karin, she linked investing in transportation and infrastructure with improving shelf life as it is one of the methods to prolong the life of products in the stores. Investing in transportation and infrastructure requires food retailers to invest in the upper stream in supply chain. As a barrier for this strategy, some researchers argued that it is quite costly for food retailers to collaborate with the stakeholders on the upper stream. However, Willys is currently working with its subsidiary, Dagab in order to improve efficiency of the logistics, which contribute to improve shelf life of food products. Thus, it might be easier for Willys to communicate with its distributor. One of the perceived barriers the logistics manager mentioned is that it is quite difficult to keep the temperature inside the truck during summer time and required them to spend the additional cost and the attention. However, as Karin mentioned, the cost to implement the strategies worth investing in since it is necessary to prolong the shelf life and they expect financial benefits by implementing this strategy.

*Markets for sub-standard products*

Several researchers suggested that one of the methods for this strategy is to sell out the products before the expiration date with lower prices, which requires food retailers laboring cost and time. The most crucial barrier Karin perceived is that some store managers are not willing to cut the price down of food products and put them on sale because they assume that displaying those products leads to damage the store’s image. This is because store managers are intending to maintain positive store image by not selling substandard products. Also, as explained under improving food labeling section, the low understanding of customers on food labeling prevents the store manager from selling products after the best before date. However, the store manager mentioned that at his store, the strategy of cutting the prices of substandard products have been implemented from a couple months ago, and once they put discount products on sale, there was a positive reaction from consumers. This indicates that there is consumer demand for products with lower price. The store manager believes that making a good use of those products enables Willys to reduce food waste in efficient way.
Concerning misshapen and food products with damaged packages, the store manager refuse receiving those visually inferior products in order to put a pressure on the distributors. Some theories say that the reason for not selling those inferior products is because consumer demand for high product quality attributes. Instead, our findings show that it is not consumer expectation but intention to make distributors follow the quality standard they have.

These two interviews show the fact that employees at Willys have a different point of views on the probable outcomes of this strategy. This could lead them to lack of consistency in implementing this strategy among stores in different locations, which is a barrier for this strategy. Since there is no clear link proved between selling substandard products and negative store image, Willys could share the information among store managers to let them know the positive responses toward this strategy from consumers.

From the interview with Karin, she admits cost-saving as a driver to implement this strategy to some extent. In addition, she stressed that decreasing negative impact on the environment as well as giving a positive social impact through reducing food waste motivates them to tackle the issue of food waste. She recognizes the positive response from the general public, which as a result can motivate them to move forward reducing food waste.

*Giving food away to charity*

Donating the foods to people who are affected by food poverty through organizations is another way to reuse food waste. For a driver, same as the previous strategy, reducing negative impacts on the environment motivates them to reduce food waste. The interviewee say that Willys could increase the environmental image on the public and gain lots of supports from the people through SNS as a result of donating activities. This means the interviewee finds a link between food waste donation and reduced negative impacts, which leads company to increase their environmental image as a result.

Karin perceived that lack of transportation as well as labors is barriers for this strategy because Willys stores are not responsible for delivering food products to the places and therefore, those social organization is required to have transportation.

Further, the store manager mentioned that donation agreement is not complicated and time-consuming, but he takes food hygiene issue into great consideration due to the associated risk
with the issue. In fact, Karin also mentioned that some store managers might consider food hygiene issue because donated food is out of their control once it leaves from stores, which prevent them from giving away food waste. These barriers make it difficult for Willys to find a responsible donation partners as a result. In other word, if they could find appropriate organizations, the opportunity for food donations opens up and Willys could expect to save their cost by generating less food waste.

According to frame of reference, the crucial barrier, which several strategies have in common, is lack of financial resource in order to implement those strategies. On the other hand, the findings show that in addition to financial resource itself, lack of education to employees prevents Willys from implementing majority of strategies. As some researchers argue, financial return would go over the initial costs in the long run even though implementation of some strategies required them to have sufficient financial resource. Taking a example of the strategy, markets substandard products, Karin said that store managers in Willys have different understanding regarding calculating the financial return, which comes from selling inferior products with discounted price and generating less food waste. In addition, lack of knowledge of the store managers on food labeling prevents them from selling substandard products. This means that lack of knowledge leads Willys to fail implementing the strategies. Thus, educating employees on this issue would be a big step for Willys in order to reduce the total amount of food waste.

As well as resource, regulation plays an important role in motivating food retailers by giving financial aids as well as supporting from the legal aspects of this issue. However, findings say that in Sweden there is less pressure and support from the government due to the fact that the regulation on food retailers regarding food waste issue is comparatively loose. In addition, the government has Swedish National Food Agency (Livsmedelsverket) and is taking a responsibility for this issue. However, measure currently taken by this agency has not motivated them to reduce food waste. As an example, regarding to food donation to social organizations, there is a concern on food hygiene issue because food retailers are the ones who should take responsibility for the potential problems. If there is a clear guideline from the government, it could motivate food retailers to donate more amounts of food and save people in need.
Our findings shows consumers have a strong impact on the implementation of strategies, playing both as a barrier and a driver. As perceived barrier, difficulty to predict consumer demand is mentioned by our interviewees. This leads food retailers to order food products more than necessary. At Willys store, store managers are utilizing both auto order system and past order recording in order to estimate how much products would be sold. Also, when he sold food products a couple days before the expiration date at his store, the store manager received positive response from consumers. This shows that there is a demand for discounted food products, and Willys could take this strategy in order to meet needs of a particular consumer group. In addition, both of our interviewees mentioned that lack of knowledge of consumers on food labeling prevent them from selling substandard products. Currently, Willys does not take many in-store approaches, which could contribute to develop consumers’ knowledge and increase the awareness on food waste as a result.

Further, some studies suggest that increasing environmental image is one of the drivers for food retailers. Instead, the finding says that environmental consideration of employees is important driving force. In other words, the intrinsic motivation on reducing food waste from the employees encouraged Willys to implement the strategies, which as a result increases environmental image among consumers receiving positive reaction on their business practices. In turn, the responses motivate them to take further steps and create the positive cycle in their business. Considering all of the information, environmental consideration of employees can be classified as society factor due to its strong relationship with social expectation toward a company. In order to strengthen the intrinsic motivation, the higher level of awareness on the issue among employees is crucial. As Karin mentioned, employees and store managers have different perspectives on food waste. If majority of them realize the true nature of this issue and tackle it as a whole, there is a possibility that the current situation could be significantly improved.
6. Conclusion

In this section the conclusion in connection to the stated purpose of the paper will be presented as well as the summary of the finding and the suggestion for the further research. The purpose of this thesis is to describe barriers and drivers and analyze that impact on the implementation of strategies to prevent and reuse food waste in retailer level. By mainly gathering the primary and second data from one of the biggest grocery stores in Sweden, Willys, as well as the relevant theories, the authors could illustrate that regulation is not the main actor to either motivate or prevent Swedish grocery stores to implement food waste reduction strategies although it is in the theories.

The study reveals that in this case the major barrier is employees’ lower level of understanding and insufficient consumer awareness for the issue of food waste. Yet the Swedish environmental conscious society is an essential driver to this movement. The noticeable point in the case is that the important people in implementing strategies in the firm see the society’s concern regarding food waste as the company’s concern. Therefore the society for, which the theory refers to the external pressure to the grocery stores, in particular study is including the internal motive as well. The result strongly supports the research of Chkanikova et al (2015) that argues the barriers and drivers to employing strategies depends to the large extend on the local context. This research can serve as a model to future researches in identifying barriers and drivers to implementing any type of business strategies.

In addition the finding strongly proves the initial claim that grocery stores do not involve in three others stages in food waste reduction hierarchy for example recycle, recovery and disposal. Instead, grocery stores mainly engage in prevention and reduce stage. Due to the fact that food retailer is a dominant influencer in the food supply chain, further research on developing food reduction strategies and model specifically for food retailer is highly suggested. Also, since consumers have a strong impact on the implementation of these strategies, the relationship between different consumer education approaches and these impacts on the level of consumers’ awareness could be another area to be investigated on.

Recommendation

In order grocery stores to reduce food wastes more efficiently, the government should work collaboratively with grocery stores more actively. As the frame of reference demonstrates that the
regulation factor, which the government is the actor, play an important role in being a barrier or driver, the government could be more supportive than how they are currently doing. Since the authority is resourceful, they are definitely able to give them a hand in term of knowledge resources as well as financial resources. Consumers are also a crucial motive regarding this case. Customers could support grocery stores by doing grocery shopping in stores that implementing food waste reduction and by making wise buying decision based on environmental consideration rather than on price. Lastly for the grocery store, several practical recommendation based on our theories can be suggested;

- Conduct a survey to employee in order to investigate on the level of awareness for the issue of food waste.
- Hold the session to store managers to educate them on different strategies and increase the internal awareness toward the issue of food waste.
- Spread the information on what they are doing in order to reduce food waste to customers as well as employees on daily basis through SNS to keep their positive store image and increase awareness of employees.
- Try different methods to educate consumers on the issue in order to increase the awareness toward food waste. Implementation of in-store approaches would be helpful to develop their knowledge as suggested by theories.
- Collaborate with suppliers in order to change the types of date labeling on a package in order to educate customers
4. References


• Food and Agriculture Organization of the United Nations (FAO), 2013, Food Wastage Foodprints, p. 1

• Food and Agriculture Organization of the United Nations, 2014, Food and Nutrition in Numbers, Food and Agriculture Organization of the United Nations, Rome, p. 1

• Food and Agriculture Organization of the United Nations (FAO), 2009, Food Retail, Agribusiness Handbook, p.5


• Lars-Erik Gadde Pegah Amani 2016,"Food supply in a network context - an alternative framing and managerial consequences in efforts to prevent food waste", British Food Journal, Vol. 118 Iss pp. 6


• Lorrayne Ventour, 2016, The food we waste, Waste & Resource Action Programme, pp. 4-5, viewed 8 May 2016


• 'Retailers shouldn't carry the blame for food waste, says BRC’ 2015, Food Manufacture, p. 6, Business Source Premier, EBSCOhost, viewed 18 May 2016


Table 4: Summary of barriers and drivers in analysis, source: self-made by the authors

<table>
<thead>
<tr>
<th>Stage</th>
<th>Strategies</th>
<th>Empirical Questions</th>
<th>Barriers</th>
<th>Drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevent</td>
<td>Raising awareness of food waste to customers</td>
<td><em>What prevent and motivate your company to let people know more on the issue of food waste?</em></td>
<td><em>Resource</em> Implementation cost</td>
<td><em>Society</em> Environmental consideration of employees</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><em>As a result, the positive response from customers</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoiding oversupply</td>
<td></td>
<td><em>What prevent and motivate your company to order the proper amount of food products?</em></td>
<td><em>Resource</em> Implementation cost</td>
<td><em>Resource</em> Cost-saving</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improving food labeling</td>
<td>Is Willys responsible for labeling?</td>
<td><em>If so, What prevent and motivate your company to avoid confusion on labeling?</em></td>
<td><em>Resource</em> lack of knowledge among store managers</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improving shelf-life</td>
<td>What prevent and motivate your company to improve shelf life?</td>
<td><em>Resource</em> Costly to keep the storage cooler</td>
<td><em>Resource</em> Government incentives Seminar on how they can improve shelf life</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Resource</em> Cost to keep the inside of trucks cool enough especially in summer time</td>
<td></td>
<td><em>Resource</em> Financial benefits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><em>Market</em> Consumer demands for</td>
</tr>
</tbody>
</table>


| Re-use | Markets for sub-standard products | What prevent and motivate your company to sell substandard products? | Resource | Lack of education among store managersd  
Market  
Consumer demands for product quality attributes  
Market  
Maintain store image  
Market  
do not sell substandard products in order to put a pressure on distributor. | Resource | Financial benefits  
Market  
Consumer demands for cheap products  
Society  
Environmental consideration of employees.  
As a result, the positive response from customers |  
Society  
Positive social impact |
|---|---|---|---|---|---|---|
| Giving food away to charity | What prevent and motivate your company to donate food to social organization? | Regulation  
Food hygiene issue  
Resource  
Lack of transportation, labors  
Resource  
Difficulty to find a partnership | Society  
Environmental consideration of employees.  
As a result, the positive response from customers |  |  |  |