

# **THE DIFFERENCES IN FOOD WASTE MANAGEMENT OF TESCO COMPANY AND ALBERT HEIJN COMPANY**

**A THESIS**

Presented as Fullfilment of the Requirement to obtain the Bachelor Degree in  
Accounting Departement



**INTERNATIONAL  
PROGRAM**

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## MANAGEMENT SUMMARY

Around one-third of the food produced in the world is wasted, and two until nine percent are contributing from retail sectors. Therefore, many parties from organizations and companies are paid attention and take action to reduce food waste by join through Sustainable Development Goals by the United Nations. As a center position of the supply chain, the retail company should concern to manage their food waste. As the largest Dutch supermarket, Albert Heijn is struggling in food waste management in order to achieve their target in food waste by reducing 4.25 tons by 2020. To improve their food waste management, Albert Heijn should reflect on Tesco, as the prior of food waste management in the world. This paper aims to acknowledge some facts about Albert Heijn's and Tesco's food waste management. The author used a literature review method by taking reliable information from various media. The result and conclusion of this research are purposed to help Albert Heijn and researchers in food waste management knowledge.

Keywords : *Food Waste Management, Albert Heijn, Tesco*

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# CHAPTER 1

## INTRODUCTION

### 1.1 Problem Description

Nowadays, food waste has become a severe issue in society. Even though food waste was recognized as an essential problem, it was not identified as a serious concern to the environment until now. According to the Food and Agriculture Organization of the United Nations (FAO), an estimated one-third of all food produced globally is either lost or wasted (FAO,n.d). Moreover, almost half of all produced food will never be consumed (FAO, 2018). Food waste can be defined as any food and edible products of foods that are wasted during the supply chain. However, that can be recovered and safe for human consumption. Food waste can be in any form such as a fresh product that did not meet the quality of shape, size and color; food that is near to, at or beyond the “best-before” date; edible foods that still can be eaten are often not used and disposed of the household kitchens and restaurant (FAO, n.d). By wasting food means there are resources such as time, energy, and materials that are sacrificed to produce the food, which is that element could be managed in a better way (Jayalakshmi. et al. 2017). In addition, food waste also contributes to financial impact and affects the environment, including the overall greenhouse gas emission (Jayalakshmi. et al. 2017). Food waste can increase methane emission caused by food decomposition in landfills. (Aschemann-Witzel., et al., 2016). In a result of food decomposition process in landfills, the carbon footprint that wasted or lost about 3.3 billion tons of carbon dioxide (UN Environment. n.d). Moreover, in Canada, food wasted was a cost amount of \$31 billion annually or about two percent of the country’s gross domestic product (UN Environment. n.d).

The United Nation has made an action of food waste in their sustainable development goals (SDG) as their main target in 2030 (UN Environment. n.d). Reducing food waste and loss is critical to creating a zero hunger (SDG2) and ensure sustainable consumption and production patterns (SDG 12) (UN Environment. n.d). Therefore, there are several UN organization that focused to reducing food waste such as FAO, the African Development Bank (AfDB), International Fund for Agricultural Development (IFAD), International Trade Centre (ITC), and World Food Programme (WFP) (Tielens & Candel, 2014). In order to prevent and reduce food waste, the European Parliament also takes their part in 2014 by

declaring the European year against food waste, inspired by Last Minute Market and its campaign “One year against waste.” (Blasi. et al., 2016).

Food waste indicates unsustainable production and consumption, which is links to other global challenges. Even though some action has been made to reduce food waste in Europe and internationally, the massive amount of a remains food waste can lead to a severe impact on society. (Filimonau.V & Gherbin., A., 2017). According to European Commission estimates, the total food waste that retail companies produced is 5% or around 4.4 million of total food waste in Europe (Blasi, E. et al., 2016). Several factors caused retail companies to waste food such as marketing tools adopted by supermarkets, low public awareness, and lack of food waste management in managerial approaches (Filimonau.V & Gherbin., A., 2017).

The Netherlands has been aware of the food waste problem since 2008 (G. A., Aramyan, L & H. Valeeva. 2016). The Ministry of Agriculture has taken several actions, such as making laws and regulations in order to achieve the target for reducing food waste throughout the chain by at least twenty percent in 2015. The Ministry of Economic Affairs (MEA) aims at reducing waste based on an economy and natural resources perspective (Tielens. J & Candel. J, 2014). It focuses on reducing post-harvest losses early on in the value chain of developing countries in its international perspective, aiming to contribute to food security (Tielens & Candel, 2014). Due to the target, for the private parties, the Dutch Food and Consumer Product Safety Authority (VWA) supports volunteer organization such as food banks and other charitable organizations with a guideline how to treat products that are past the ‘best before’ date (Aramyan.L., Valeva. N., 2016). There are also some volunteer organizations that take part that aimed to reduce food waste in the Netherlands, such as Vakcentrum and Centraal Bureau Levensmiddelenhandel (CBL) (Euro Commerce, 2017). Besides volunteer organizations, several retail companies also have taken several actions to be a partner of this activity, such as Albert Heijn, Plus, and Lidl.

Albert Heijn is the largest Dutch supermarket chain in The Netherlands. Not only in the Netherlands, but Albert Heijn also serves in Europe, the US, and Indonesia (Ahold, 2018). Albert Heijn is known as a retail food company that provides daily supplies with the best local brands. Albert Heijn used a business strategy called ‘leading together strategy,’ a strategy that defines their shared values and promises to customers, associates, and the community while giving them a great local brand (Ahold, 2018). That strategy also focuses on five strategic areas: growing omnichannel business, investing in technology, promoting healthy and sustainable products, portfolio and scale efficiencies, and people as an asset.

(Ahold Deize, 2017). With this in mind, Albert Heijn committed to reducing food waste in their operations and supply chain, and their brands will help customers reduce food waste at home.

Moreover, Albert Heijn also participated as a member of Euro Commerce, an organization of retail, wholesale, and other trading companies that aimed to manage their food waste (Euro Commerce, 2017). As a part of their promises to reduce food waste, Albert Heijn associated as a partnership with a restaurant named Instock (Ahold, 2017). Instock uses all of the food products that would otherwise go to waste in Albert Heijn and make it to edible food. Instock claims that they saved about 2.000 kg of food every week (Euro Commerce, 2017). Unfortunately, Instock is incapable of saving Albert Heijn to achieve their target in reducing food waste in 2020. Therefore, Albert Heijn still struggles and should find another extra action in order to achieve their food waste goals. Albert Heijn should do more research and compares their company with other companies that have a proper food waste management like Tesco because Albert Heijn should reduce 1.05 tons of food waste in 2 years in order to achieve their goals.

Tesco has been pointed as the top supermarket for food waste prevention in the United Kingdom (Dickinson. K, 2018). Tesco was known as the largest groceries in the United Kingdom, which make an equal comparison to Albert Heijn (Tsang. A, 2019). Tesco is the first supermarket that joined to United Nation Sustainable Development Goals (UN SDG) in reducing food waste by 2030 (Dickinson. K, 2018). Moreover, Tesco also had a good reputation by having a transparency image in providing food waste data that has been audited independently (Dickinson. K, 2018). Based on that information, Albert Heijn can point Tesco as their benchmark and reflect their action to have proper food waste management.

As a result of the food waste management issues above, the researcher is interested in analyzing what is the cause and solution to these problems. The researcher will focus on the following management problem “Albert Heijn does not know which extra actions they should take in order to achieve their goals to reduce food waste to a maximum of 4,25 tons by 2020”. Based on this management problem, the researcher decided to make “Albert Heijn does not know what Tesco supermarkets are doing in order to reduce food waste” as a research problem. The purpose of this research result is for Albert Heijn to be able to identify and decide what kind of extra action that Albert Heijn should take from reflecting Tesco food waste management.



## **1.2 Research Objectives:**

Based on the explanation in the problem description, the primary purposes of this research are for Albert Heijn to be able to identify and decide what kind of extra action that Albert Heijn take by reflecting Tesco that had better food waste management. Furthermore, this researcher also provides further insight regarding the differences between the food waste management of Tesco and Albert Heijn.

## **1.3 Research Question:**

What are the differences between the food waste management of Tesco and that of Albert Heijn?

1. How does Tesco manage their food waste management?
2. How does Albert Heijn manage their food waste management?
3. What are the indicators of food waste management in Tesco?
4. What are the indicators of food waste management in Albert Heijn?



## CHAPTER 2

### THEORETICAL FRAMEWORK

#### 2.1 Introduction

Food waste represents a critical problem for national and international sustainability (Filimonau & Gherbin, 2017) which gain the attention of United Nation include food waste to one of seventeen Sustainability Development Goals (SDGs). Therefore, the European Union and the United Nations have made many policies, framework, and a guideline of food waste. However, Filimonau & Gherbin (2016) argued that the retail sector still being ignored and has less attention from researcher and companies due to the difficulty to measure food waste. Retail sectors are the most strategic position because it was in the center of gravity of the food supply chain that was a link between consumers and suppliers (Filimonau & Gherbin, 2017). Additionally, retails sectors have the power to affect the amount of food waste, whether it could be a positive or negative effect (Filimonau & Gherbin, 2017). Hence, in-depth knowledge of food waste and waste management is provided in this chapter to get an insight into the food waste management approach that uses in this research.

#### 2.2 Definition of Food Waste and Waste Management

##### 2.2.1 Definition Food Waste

There is various definition of food waste. According to the Food Agriculture Organization (FAO) Save Food Initiative, food loss, and waste is dignified for items that are coordinated to human consumption, excepting feed and parts of items which are not edible (Halloran et al., 2014). In a specific way, food waste was defined by European Union as composed of raw or prepared food materials and incorporate food loss previously, during or after meal preparation in the household, just as food that is waste during distribution, manufacturing, retail and food services activities (European Commision, 2010 p. 9). Therefore, food waste refers to the food lost or wasted along the food supply chain providing edible products for human consumption (Halloran et al., 2014).

In general, Papargyropoulou et al. (2014) and The Waste and Resources Action Programme (2015) classified food waste as avoidable, unavoidable, and potentially avoidable. Avoidable food waste is food or parts of food that are thrown away but considered edible by people, and some point before disposal (Papargyropoulou et al.,

2014). Meanwhile, unavoidable food waste is a waste from food that is not and has not been, edible under normal circumstances such as bones and skin (Papargyropoulou et al., 2014). Lastly, possibly avoidable is food that considered edible and would have eaten for some people, and others do not (Garcia-Garcia, Guillermo, et al., 2017). In a detailed, Food Use for Social Innovation by Optimising Waste Prevention Strategies (FUSION) (2014) argued that food waste in retail sectors could be grouped into two categories: pre-store waste and in-store waste. Pre-store waste arises while the retail company does not accept the foodstuff from the supplier because of damaged or do not pas internal quality control. Meanwhile, in-store waste is classified when retail company sort out and discard food, which has a low chance to be sold due to unaesthetic or passed 'best-before' dates.

There are multiple factors and reasons that can influence to food waste. Norden (2011) argued that unsalable food becomes the main factors of food waste in retail sectors. Unsalable food means the food product where 'best before' date has expired, unlabeled fresh fruits or vegetables, and product with aesthetics damage (Filimonau &Gherbin, 2017). Gustavsson, Christel, and Ulf (2011) stated that marketing schemes such as food display tendencies, label dates, prepared foods, and lack of internal control in handling and storage food become the drivers of food waste for in-store retail (Killeen, 2015). Label dates are substantial for inventory, yet also, drive waste as a result of consumers being unwilling to an item that is close to their termination date (Killen, 2015). However, label dates were ineffectively interpretation and cause disorientation among customers because of unsure of how to peruse and translate the label dates on packaging. Improper handling, inconsistent refrigeration, and rejected shipments also can lead to food waste during distribution and storage (Killeen, 2015).

### **2.2.2 Definition of Waste Management**

Sirén, E., & Carsjens, G. J (2013) argued that waste management is essential because unhandled waste can contaminate the environment, especially water and soil, which can be a risk to human health. Mainly, waste management defined as a mixture of policies, behaviors, and technologies (Sirén, E., & Carsjens, G. J, 2013). Appropriate waste management is a core element to ensuring resources efficiency and the sustainable growth of European economies (European Commission, 2010). According to Council Directive 2008/98/EC point, nine amended stated:

*“waste management” means the collection, transport, recovery (including sorting), and disposal of waste, including the supervision of such operations and the after-care of disposal sites, and actions are taken as a dealer or broker;’* (European Union, 2018, p.13 ).

Tchobanoglous and Kreith (2002) identified six functional elements that recognized in the waste management system (Sirén, E. & Carsjens, G. J, 2013):

1. Waste generation

Waste generation is identifying something as waste is based on each product categories.

2. Waste handling, separation, storage and processing at source

Handling and separating waste should be done before putting waste into the collection and take into a collection point. Waste separation plays a significant role in considering the quality and use of end-product. The way waste is stored before it is collected important to public health and aesthetic to be reused again.

3. Collection

The collection is the gathering and transport of waste to a processing facility, transfer station, or landfill.

4. Transfer and transport

Transferring waste from a smaller collection vehicle to a large one and the transport to a processing or disposal site is the fourth of waste management.

5. Separation, processing, and transformation of solid waste

Transforming waste in different kinds of the process with the aim of energy, resource recovery, the reduction in volume, and weight. Aerobic composting is the way usually organic waste being transform. This system usually happens in material recovery facilities, transfer station, combustion facilities, and disposal sites.

6. Disposal to landfill

Disposal to landfill could be to establish waste treatment and disposal through corporation between municipalities and organizations.

There are six interrelated groups can influence the development of waste management: public health, environmental protection, resource value of waste, closing the loop, institutional and responsibility issues, and public awareness (Sirén, E., & Carsjens, G. J, 2013). However, the development of waste management must be follow with the regulation. Regulations and incentives on a different institutional level can affect waste management as an essential factor shaping of the waste management system (Sirén, E., & Carsjens, G. J, 2013).

Waste management policies approaches ought to be coordinated and lined up with the more extensive policies on food, agriculture, food standard, food poverty mitigation and sustainable production and consumption (Östergren, K. et al., 2014). A waste policy that was made by European Union has advanced through a progression of environmental action plans and framework of legislation that expect to diminish the environmental and health impact of waste and improve Europe's resource-efficient economy (European Commission, 2010). Additionally, the long-term goals of waste management policy are to turn Europe to recycling society, preventing waste, and utilizing unavoidable waste as an asset or resource.

There are several policies of waste management and waste prevention that already made for several waste issues such as food waste and waste oil. Halkos et.al (2016) classified five main elements of waste management policies in the European Union:

- Waste Framework Directive (WFD) 2018/851 amending Directive 2008/98/EC of European Parliament and the Council of 30 May 2018 about a general context of the waste management requirements, builds up the basic definitions around waste management for European Union, and specific arrangements for each waste stream and how it should be manage.
- Directive 2000/76/EC of the European Parliament and of Council of 4 December 2000 about the incineration of waste
- Directive 2000/59/EC of European Parliament and of the Council of 27 November 2000 about on port reception facilities for ship-generated waste and cargo residues.

- Regulation (EC) No. 1013/2006 of the European Parliament and of Council of 14 June 2006 about shipments of waste between countries.
- Decision 2000/532/EC about the classification system of waste and a list of waste.

### 2.3 Food Waste Hierarchy

In the early 1970s, the principle of the waste hierarchy was introduced into European policy, and in 1989, the Community Strategy for Waste Management was clearly defined in European legislation (Papargyropoulou et al., 2014). The European Union member aims the waste hierarchy is to guarantee and distinguish the possibility of waste is being managed in the most asset proficient way to convey the best generally ecological result (Papargyropoulou et al., 2014; Siren. E., 2013). The waste hierarchy is measure as an applicable rule for figuring waste methodology. The Directive (2010) presents a five-step food waste hierarchy which the priority order starts from prevention as the best choice and pursues by reuse, recycling, and different types of recovery and disposal.

#### Prevention

Waste prevention is known as the best method to build assets proficiency and lessen the ecological effect of waste (European Union, 2018). Waste prevention is firmly connected to improving assembling strategies and impacting customers with the goal that they request greener products and less packaging (European Commission, 2010). In order to prevent food waste, improved food labeling, better consumer planning and preparing food, technological improvements in packaging and improving shelf life for perishable foods is several methods that can be used to (Papargyropoulou et al., 2014).

#### Reuse

European Waste Framework Directive in Article 3 of 2008 defines reuse as any activity by which products or part that are not waste are used again for a similar reason for which they were considered such managing waste prevention (WRAP, 2011). Reuse includes the rehashed utilization of

products and parts for a similar reason for which they were (European Commission, 2010). Food waste from the inedible food part that was removed from the supply chain is usually re-used for animal feed, bio-based materials, and biochemical processing (Östergren et al., 2014).

### **Recycling**

Recycling reduces the number of waste that winds up in landfill locales while eliminating the number of material required from the natural environment (European Commission, 2010). Recycling can be defined as methodical accumulation, preparing, and reuse of materials, which incorporate the accompanying classifications such as paper, glass, plastic, wood, aluminum products and iron (European Commission, 2010). Halloran argues retail sector is an actor that has to the responsibility of recycling waste (Halloran et al., 2014). According to the waste hierarchy, recycling of food waste can be done by sending waste to anaerobic digestion and waste composted (Jain.S. et al., 2018). Anaerobic digestion (AD) is a decomposition procedure where food waste separates in a progression of natural responses (Halkos. et al. 2016) and causing biogas that is consist of methane and nutrient (Eunomia, 2015). Moreover, the European Union 2008 Directive sets a mandatory regulation to recycling organic waste above 10t per year (Mourad, 2016).

### **Recovery**

Recovery is one of the most frequently promoted solutions to food waste. Food recovery can involve collecting unharvest produce on farms and at markets, re-processing food, or matching the supply of available extra food to the demands of food bank and charities (Mourad, 2016). Recovering food means to avoid the wasteful use of fresh water, carbon fossil fuels, and environmental services used to produce food. This approach estimated the ecological savings by calculating water footprint and ecological footprint. (Blasi, et al., 2016). In 2014, Environmental Protection Agency (EPA) explained food recovery hierarchy starts from sources reduction as the most



preferred, feed hungry people, feed animals, industrial uses, composting and incineration or landfill as the least preferred (Killeen, 2015).

### **Disposal**

Disposal to the landfill is the type of waste treatment that was produce and discharges methane into the air. Methane is a ground-breaking ozone-depleting substance 25 times more intense than carbon dioxide which can develop in the landmass and caused blasts (European Commision, 2010). Others effect to waste in landfill is leachate in landfill sites that were produced from heavy metals (European Commision, 2010). Leachate is a liquid that can infect nearby groundwater and surface water and soil, which could represent a hazard to general public health and environment (European Commision, 2010).

## **2.4 Classification of Retail Food Waste**

According to the European Commission, in the European Union, more than 44 million tonnes of food is being wasted at the retail stage, which represents for around five percent of the food waste in the supply chain. European Union (2012) stated that around 83 percent of edible food being waste during the retail stage. In the Netherlands, the retail sector has an account for more than eighteen thousand tonnes of food waste produces annually.

A study conducted by Lebersorger & Scheineider (2014) shows the main reason why fruits and vegetables are discarded because of unaesthetic products. These barriers happen because of the lack of handling in storage and awareness of employees. Also, unaesthetic products could happen because of customers that lack in awareness of packing of vegetables or fruits of which one single piece is being discarded in its (Lier. I. v, 2017).

Waste of bread and dairy products are mainly discarded because the products have reached their best before date. Lebersorthatger & Schneider (2014) found that 20 percent of dairy product is being discarded because of breakage and damage packaging caused by employees and customers. Therefore educating employees could help in reducing food waste. In contrast, fresh bread which has a short period of sales. So if the bread is not getting sold in the evening, the supermarket will discard or send it back to the bakeries (Lier, 2017).



Internal quality control is one of the factors that affect food waste in the retail company. Lier (2017) argues that internal control becomes the reason for meat products are discards. An incorrect storage temperature that can make spoilage of meat and the safety of meat cannot be guaranteed (Lier, 2017).

In a result, a retail company might have food loss in a various rate and group of the product. The main category product is being wasted in retail sectors is coming from dairy products account to 1.3 percent, Bread and pastry 2.8 percent and 9.7 percent returned to the producers, fruits and vegetables are 4.2% (Lier. I. v, 2017).

## **2.5 Food Waste Management Strategies in The Retail Sector**

The retail company is a foundation of motivation and guidance for reducing food waste (Kor, Prabhu. & Esposito, 2017). Food waste is an interlinked and complicated issue, and correspondence and collaboration with all suppliers are expected to sufficiently handle the issue of food waste (Lier, 2017). Retail company also have a strategic position to the boundary with consumers by marketing and habitual purchase of food. Therefore, the retail company has a significant role in both causing food waste and in strategy to reduce food waste. Food waste management between retail company will differ on the size of supermarkets and company business strategy. Food waste management is categorized into two phases: a pre-store stage and in-store stage (Lier, 2017).

### **2.5.1 Pre-store stage**

The pre-store stage is the phase before products reach the retail store but on which the store already has a direct influence (Lier, 2017). In this stage, waste prevention to reduce food waste before it reaches a store is the most effective way. Even though the store faced an obstacle in this stage because of fluctuation in demand of consumers, what customer needs, and how much retail company should place an order. Östergren, K. et al. (2014) define essential steps in reducing food waste are by forecasting customer demand and order planning. The application of this strategy will be useful if the store has a good forecasting order system to know the quantity and number of orders. Therefore, products in-store, guaranteeing product freshness, and minimizing food waste a better must be in one line in order to get a better forecasting order system improvement in logistic (Lier, 2017). A primary factor for those two strategies is a good communication and collaboration with all partners

involved in the supply chain. In this stage, there are some barriers also that can affect food waste management, such as the goals of the store that attempt to make availability of products. Therefore, Lier (2017) stated that a retail store can reduce food waste by increasing the chance of all product being sold and not always trying to have a full shelf to reduce food waste.

### **2.5.2 In-store stage**

The in-store stage describes the retailer delivers the phase from the moment products until they sold to consumers or are disposed of the supermarket. According to Lier (2017), the in-store stage can be approach from six different views: economic, social, technical, legal, communication to consumers, and training of employees.

- **Economic**

The goals of a company are to get as much as possible profit. Eriksson (2012) argued that, with food waste management, a retail company still can get their profit by selling edible food with a reducing price before the product reaches best before date. It emphasizes by Filimonau and Gherbin (2017) statement that price reduction is the most popular ways to maximize revenues while attempting the issue of food waste management in the store. Usually, companies use price reduction strategies to sell their product, which is close to best before the date and unaesthetic product that does not meet internal quality control. Besides price reduction to a product that is close to best before date, Lier (2017) also stated a product could be sold to other parties, like restaurant and reused in prepare ready-to-eat meals in their store.

- **Social**

In social aspects, food waste can be reduced by food donation. Food donation is the most frequently promoted solution to food waste management (Mourad, 2016). Unsold edible foods that remain can be donated to feed hungry people through food charities and food banks. Food banks are charity organizations that are aiming to distribute food to less fortunate families by collecting from supermarkets, producers, and retailers (Lier, 2017). With these management strategies, a company might gain a positive response from society and

stakeholders. Also, some supermarkets donated their food to employees and customers, such as Jumbo in the Netherland.

At the most retail companies, especially supermarket, an unsold of edible food but discarded for human consumption, usually reused to feed animals and biogas for electricity, as like as stated in food waste hierarchy. Converting food waste to compost, thus providing a nutrient-rich soil amendment (Lier, 2017).

- **Technical**

Innovating packaging is the solution to preventing food waste. Eco-unfriendly packaging can make fresh produce susceptible to bacteria and lead to spoilage (Östergren et al., 2014). Aside from eco-unfriendly packaging, packaging can help food waste prevention because the package is necessary for protection during transportation of products (Detailhandel Nederland, 2016). The damage of package may happen in food processing step and packaging, prompting more food waste in the commercial and retail segments of the food chain (Östergren et al., 2014). Frequently, a massive packaging becomes the reason why the products cannot be sold before the best before date (Östergren et al., 2014). Hence, decreasing wholesale package size must be executed in collaboration with wholesale or producers and retail (Östergren et al., 2014). The industry should start the better design of packaging and portion sizes and now only sells by the piece in an attempt to reduce food waste (Halloran et al., 2014).

- **Food waste management regulation**

Not only retail company, suppliers, and consumers, the government also can influence food waste management in the retail industry. A government can make a legal requirement regarding the clarification of food products and food waste to a retail company, suppliers, and consumers. Declaring the number of waste in a retail company by the government also can force the company to reduce food waste (Lier, 2017). Moreover, the government also can be a helpful tool for a retail company in order to apply these management strategies (Lier,2017).

- **Communication to consumers**

Developing consumer's awareness is one of another driver to have adequate food waste management in practice ( Filimonau & Gherbin, 2017). Label dates are essential to food because it provides information about the safety and freshness of foods (Lipinski et al., 2013). However, many consumers are lack of knowledge on the function of label dates that lead to a mistranslation by customers that can increase food waste amount. Many consumers choose to interpret “best before” dates as last day of use. For example, if consumers lack knowledge about when the papaya is ready, how to prepare it, and how to use it as an ingredient, papaya loss will be high (Östergren et al., 2014). Therefore, in some countries as like the United Kingdom, the government release an amendment of guidelines that were stated to remove label dates in term of “sell-by,” and in purpose of food quality, company can use “best before” and “use by” for food safety (Lipinski. B., et al., 2013).

Teaming up with consumers to raising their awareness and educating them about food waste is very important. Retail companies can cooperate with another party or sponsor to do a campaign, for example, the Co-operative in the United Kingdom use to share food stories which feature waste reduction tips and recipes to utilize leftovers, especially the young (Kor, Prabhu & Esposito, 2017).

- **Training of employee**

Employees are often considered as ‘under-utilized resources’ in a company’s development and implementation of sustainability programs and strategies (Filimonau & Gherbin, 2017). Before a retail company educating their consumers, they have to provide their employees with accurate knowledge and training about food waste, especially to employees who control the quality of the fresh food products. Lier (2017) stated objectives of training employee about food waste is to determine which product should be remove from the shelves, how much the lifetime of the product, and how to store the product well.

## CHAPTER 3

### RESEARCH METHODOLOGY

#### 3.1 Research Methodology

To conduct the research, the researcher used a literature review to gather data. Therefore, the data that are used is collected from various sources of media. The media that are used for searching relevant material consists of the following:

- Scientific and Professional from journals are the primary sources in this research project.
- Newspaper and magazine articles
- Theses and dissertations
- Annual report of Albert Heijn
- Tesco sustainability report
- Tesco sustainability progress update report
- Albert Heijn, Tesco, FAO, European Commission website

#### 3.2 Article Search Method

The following journal provided most of the articles that are included in this research project:

- Journal of Retailing and Consumer Services
- Journal of International Food & Agribusiness Marketing
- Journal of Cleaner Production
- Journal of Food Products Marketing
- Food Policy

#### 3.3 Identification Of Key Words

In order to collect the article that is relevant for this research, the following keywords and abbreviations have been used in various combinations: *Food Waste, Food Waste Management, Waste Management, Food Waste Reduction, Retail Company, Sustainable Report, Integrated Report, Sustainability, Ahold Deize, The Netherlands, Sustainability Development Goals (SDG), Albert Heijn, Tesco.*

### **3.4 Selection Of Search Engines**

The following search engines have been used to provide the necessary relevant articles:

- Google Scholar
- Science Direct
- Emerald Insight
- Saxon Library
- Research Gate

### **3.5 Selection And Number Of Reports**

Firstly, the journals and professional reports were selected based on the title and keywords. The discussion in this study is limited to the issue of reducing food waste management that currently happened. All of the food waste management articles, journals, reports, theses, and dissertation that are valid and reliable to the topic of research will be used. Moreover, this research also used Albert Heijn and Tesco's sustainability report and annual report of 2017/2018 and 2018/2019.

### **3.6 Research Method for Others Media**

Also, articles, books (textbook, and reference books), theses and dissertations, newspaper and magazines articles, and other types of information such as conference and websites were included. The search for relevant newspaper, magazine articles, and websites was also conducted via the internet.

## CHAPTER 4

### RESULT

#### 4.1 Tesco's food waste management

Tesco is one of the world's largest retailers that serving over 50 million customers and sourcing food from thousands of suppliers across more than 70 countries and produce multi-million pounds of food waste. (Filimonau & Gherbin, 2017). With that enormous numbers of customers and suppliers, Tesco realizes how strategic their position, which can lead a positive or negative impact on food waste. Therefore, Tesco makes several indicators of food waste management in sustainability progress update report in 2018/2019, Little Help Plan; that aiming to reduce food waste in their retail operation:

1. Percentage of food surplus, edible food that is safe for human consumption, redistributed to humans or animals
2. Percentage change in tonnes of food waste compared to the previous year
3. Number of partnership suppliers
4. Consumers awareness in food waste

Based on those indicators, there are several actions that Tesco does to manage their food waste reflecting on food waste hierarchy and indicators of Tesco's food waste management:

1. Prevention of food waste

Price reduction will occur when the foodstuff is approaching their expired date and do not meet the quality control of the corporate due to aesthetical standards. Therefore, Tesco launches its product lines called 'Perfectly Imperfect' product that range 'wonky' 'ugly' 'damage' fruits and vegetables are a sale at a discounted price (Filimonau & Gherbin, 2017).

As one of the primary cause of food waste, Tesco decided to remove label dates in over 180 products in fruits and vegetables. This action has success by preventing around 350 thousand tonnes of avoidable food waste with the value of around 1 billion pounds sterling a year (Frost.K., 2018).

Besides food products, Tesco also concerns how are they package their brands and how does it influence to the environment. Therefore, Tesco will change their materials of packaging into recyclable packagings such as the collection of soft



plastics such as pouches, crisp packet, and bags that will recycle into an oil that can be used to make a new plastics (Tesco, 2019).

## 2. Reuse of food waste

Tesco has targeted their food donation by supporting SDGs zero hunger, to facilitate food surplus donation programs in all stores to provide meals to those need by 2020. On these practices, Tesco also provides indicators such as percentage of the stores that are joining in Tesco's food surplus donation programs and the number of meals donated through food surplus redistribution programs. In the results, there are 64% of stores that are participating in the program with the total donation is 62.7 million surplus foods to local charities and community groups (Tesco, 2019).

Tesco has the Community Food Connection program that linked to the partnership to redistribute their food surplus with FareShare. FareShare is the United Kingdom's food distribution charity centers that fighting hunger and food waste (FareShare, n.d). Moreover, Tesco also let their employee take surplus food for free.

## 3. Recycling food waste

They have separated waste management area to manage their food waste to achieve this goal. As an example, wasted raw meat will be separate from other food waste, and all of them are recycling as pet food and energy recovery. Tesco also recycled their bakery waste to re-use as animal feeding and cooking oil used for biofuel for Tesco's lorries (Filimonau &Gherbin, 2017). Tesco is also transforming their 'wonky' or 'ugly' food product becomes health juices that are consist of fruits and vegetables.

In their sustainability reports, Tesco claims they help their suppliers by supporting them through a workshop on food waste measurement and response for controlling the progress of every each supplier periodically. Tesco also supports their suppliers to published food waste data based on supplier's business activity. Moreover, Tesco is also working with their suppliers in developing innovative products such as a partnership with a local distiller and using grapes to produce a premium gin.



#### 4. Recovery of food waste

According to Filimonau & Gherbin (2017), Tesco separated raw meat waste with others and transform them as bio-fuel to as energy recovery. Same goes to cooking oil and fat. Those products are used as energy recovery in bio-diesel form and distributed for Tesco's lorries.

#### 5. Zero food waste disposal

According to The United Kingdom's Department for Environment, Food and Rural Affairs (DEFRA), seafood, milk, raw meat, and eggs are ban from landfilling in the United Kingdom. Other food waste management practice that Tesco does is zero waste to landfill (Filimonau & Gherbin, 2017). Tesco shows their proper food waste management by no foodstuff that near their expired dates goes to landfill instead of recycling them.

In conclusion, the researcher provides a summary table about how Tesco manage their food waste and classified them based on food waste hierarchy categories and Tesco's food waste management indicators.

Waste Hierarchy	Key performance indicator	Food waste management
Prevention	Percentage of food surplus, edible food that is safe for human consumption	Price reduction
	Percentage change in tonnes of food waste compared to the previous year	Remove label dates
	Consumer awareness in food waste	Improve customer awareness
	Number of partnership suppliers	Partnering with suppliers
Reuse	Percentage of stores that are part of the Tesco food surplus donation program	Food donation, redistribution network
	The number of meals donated	

	through food surplus redistribution program	
Recycle	Percentage change in tonnes of food waste compared to the previous year	Transforming into animal feed, biogas, compost, and packaging
Recovery	Percentage change in tonnes of food waste compared to the previous year	Recycling into energy such as bio-fuel and bio-diesel
Disposal	-	-

Table 1: Tesco's food waste management based on food waste hierarchy and Tesco's key performance indicator

#### 4.2 Albert Heijn's food waste management

Albert Heijn defines a food waste during retail is a food waste that is wasted in stores, warehouse, and transport. Albert Heijn believes to decreasing their food waste by 20 percentage from period 2016 to 2020, with reducing hunger by maximizing the unsold recovery food, collaborating and innovating with their supplier to reduce food waste and improve customer's awareness due to household waste (Ahold Delhaize, 2019). There are three approaches that Albert Heijn takes to make less food waste: reduce food waste during retail operations, food donation, recycling food waste. By having those approaches, Albert Heijn defines performance indicators in food waste management to reduce food waste, such as:

1. Number of tonnes of food waste per food sales
2. Number of tonnes of food waste sent to disposal per food sales
3. Percentage of total food waste recycling
4. Percentage of unsold food donated to feed people

Based on those indicators, there are several actions that Tesco does to manage their food waste reflecting on food waste hierarchy and indicators of Tesco's food waste management:

## 1. Prevention of food waste

Albert Heijn starts to make an action such as smarter product ordering and supply management, providing storage guidance on food packaging, discounting perishable products that near expired date and unaesthetic vegetables, and improving consumer's awareness (Ahold Deize, n.d). Albert Heijn takes a new step in their food waste management by using artificial intelligence. Similar to Tesco, Albert Heijn make a trial of a new system in Zandvoort branch in the Netherland for two months, called dynamic discount which aims to reduce food waste of chicken and fish products (Pieters.J., 2019). This application will reduce the price of chicken and fish based on their sell-by-date with criteria, a higher discount for an item that near their expired (Pieters.J., 2019). Dynamic discount also helps Albert Heijn in reducing labeling in food because they used an electronic price tags, which show a regular price and discount price at specific expired date (Ahold Delhaize, 2019).

Alongside the prevention of food waste, Albert Heijn educates their employees since the beginning of their career at the supermarket to gain awareness of food waste (Lier, 2017). It can influence the employee to gain more knowledge of the freshness and safety of food.

## 2. Reuse of food waste

In Albert Heijn sustainability report 2018, stated food donation had contributed 19 percentage from the total food waste (Ahold Deize, 2018). Albert Heijn sends unsold foods to the food bank, charities, and entrepreneurial businesses that cook with unsold food like Instock. Instock is an independent foundation engaged in the restaurant sector and supported by Albert Heijn in the form of investments for new projects, gives a food donation of unsold food, and paying salaries from Instock founders (In stock, n.d). Besides Instock, Albert Heijn also donates food waste to the local food banks like Dutch Voedselbank.

Albert Heijn also reuses the food waste that is safe for human consumption and process them into a new product that is salable. For example, Albert Heijn transforms their 'ugly' tomato into ketchup and sell it again with their brands.

### 3. Recycle of food waste

Albert Heijn optimism will reduce 25 percent or around 20 million fewer packages in 2025, and all packaging of Albert Heijn brands will be recyclable (Albert Heijn, 2018).

At the end of 2018, Albert Heijn has a campaign called ‘Less Packaging and More Recycling’ supported by Milieu Central that aims to raise and to educate consumers about how to be more sustainable with use less packaging material, the usefulness of packaging, and the separation of waste (Albert Heijn, 2018).

In their sustainability report, Albert Heijn claims that they had recycled their food waste for animal feed, biogas generation, compost, and some of them are recycled by rendering.

### 4. Recovery of food waste

There is no information regarding food recovery in Albert Heijn. However, there is information about food waste be to recycle as biogas generation. So, if the food waste that is used is unavoidable food waste, those actions are including as recovery in food waste hierarchy.

### 5. Disposal of food waste

The researcher found Albert Heijn still use disposal as their food waste management, but there is no detail information such as how much, how, and what kind of food waste is discarding. However, as a member of the Consumer Goods Forum, CEO-led organization that helps the world’s retailers to secure consumer trust and drives a better change to efficiency (The Consumer Goods Forum, n.d), Albert Heijn aims to reduce their food waste sent to disposal.

Waste Hierarchy	Key performance indicator	Food waste management
Prevention	Number of tonnes of food waste per food sales	Price reduction
		Educating employee
		Forecasting product ordering
		Remove labeling
		Improving customer’s awareness
		Improve packaging
Reuse	Percentage of unsold food donated to feed people	Redistribution network
		Food banks

	Number of tonnes of food waste per food sales	Human consumption
Recycle	Percentage of total food waste recycling	For animal feed, biogas, compost, packaging
Recovery	-	-
Disposal	Percentage of unsold food donated to feed people	Partnership with community

Table 2: Comparison of food hierarchy, Albert Heijn's food waste management indicators, and food waste management in Albert Heijn

### 4.3 Comparison Food Waste Management in Albert Heijn and Tesco

Based on the findings, here a comparison of food waste management in Albert Heijn and Tesco that are use food waste hierarhy as approach. The data are present below:

Food waste Hierarchy	Food waste management	Tesco	Albert Heijn	Explanation
Prevention	Forecasting product ordering, storage, disposal	v	v	There is no specific information from both companies.
	Price reduction	v	v	Both companies have their application, 'Food Cloud' and 'Dynamic Discount.'
	Remove label date	v	x	Tesco removed label date in fruits and vegetable product
	Improve packaging	v	v	Both supermarkets do with the benefit of technology advance
	Improve customer's awareness	v	v	Both supermarkets use a campaign in several ways
	Educating employee	v	v	Employees get training at the beginning of their

				career in both companies.
Reuse	Redistribution Network	v	v	Both supermarkets are redistributing their food surplus. For Tesco, they use a partnership to Fare Share and Albert Heijn are networking with In Stock.
	Food banks	v	v	Both supermarkets send their food waste to local food banks.
	Human consumption	v	v	Albert Heijn reuses their 'ugly' tomatoes into ketchup and sells it again.
Recycle	For animal feed	v	v	Tesco use the disposal of raw meat and bakery
	For biogas	v	v	Tesco use the disposal of raw meat;
	For compost	v	v	There is no specific information from both companies.
	Packaging	v	v	Both supermarkets have recycled their own brand packaging. Tesco: 83% Albert Heijn: no information.
Recovery	Recover energy	v	x	Raw meat in Tesco is recycled to biofuel.
Disposal to landfill		x	v	Albert Heijn still contributing to the disposal to landfill.

Table 3: Comparison of food waste management in Tesco and Albert Heijn

## CHAPTER 5

### CONCLUSION

The aim of this research was to gain an insight into the differences in food waste management between Albert Heijn and Tesco. Retail industries give two until nine percent of the total food waste in the world, and around five percent in Europe (Filimonau & Gherbin, 2017). Many waste management strategies and framework has established and influenced food waste management. In this research, the researcher used food waste hierarchy that was made by the European Union as an approach to make a comparison in food waste management between Albert Heijn and Tesco. Additionally, the key performance indicators of food waste management in both company are similar. Either Albert Heijn or Tesco, they use the number and percentage of food waste per food sales as the indicators of food waste management.

Tesco and Albert Heijn already have a food waste transparency report by publishing it annually. However, Tesco is more transparent because they realize report about their sustainability program updates twice in a year, which gives Tesco more has clear goals and commit to reducing their food waste. Tesco also has clear information and detail about how they are going to manage in order to reduce food waste.

Moreover, in the recycle stage, Albert Heijn only recycled their food waste of packaging. Meanwhile, Tesco has done more with food waste of bakery and raw meat as animal food and biofuel. Additionally, Albert Heijn should consider removing “best before” label as like Tesco does, which is also recommended by the United Kingdom’s government. Overall, Albert Heijn still lacks on managing food waste, especially in food donation, food recycling, and disposal. Albert Heijn should invest more to research and development to get more insight on what should they do to improve their food waste to be as good as Tesco does.

As stated in the previous chapter, Albert Heijn still use disposal to the landfill in their food waste management. Meanwhile, in Tesco there is no food waste going to disposal instead of recycling them all. This food waste management is not environmental friendly because it will give a negative impact to public health and environment.

Another difference is that Albert Heijn does not have disposal report in their food waste management report. Albert Heijn also has to reflect on Tesco according to improve Albert Heijn’s food donation, recycling waste, and disposal. Importantly, Albert Heijn should

take more action in food donation by not only rely on Instock, Dutch food bank, and local food bank.

To summarize, supermarkets such as Albert Heijn and Tesco could work towards reflecting these differences to raise more awareness for food waste management within the supply chain. Overall, Albert Heijn should more reflect Tesco in order to have better food waste management in the future.





## CHAPTER 6

### RECOMMENDATION AND LIMITATION

The results of this research provide a good point for further research into the differences in food waste management of supermarkets. From this research, it establishes what the differences in food waste management between Albert Heijn and Tesco are. The next step that the researcher would like to give a suggestion and recommendations to the government and retail company, especially Albert Heijn. The recommendation that the researchers give is based on the current situation and regulations.

The researchers would like to suggest a general recommendation to the government as the policymaker to make a regulation and guidelines about food waste reporting. As stated in the previous chapter, by publishing a food waste management report, can help a company to control food waste target and provide the information of a retail company about food waste management. The report should include a clear and detail information such as what is company goals towards food waste, how they manage their food waste, how many do they produce food waste in a year, what is company indicators of their food waste management, and how the company measures their food waste management. Not only give an advantage to the government, but this reporting also can help the company to gain more social perspectives from stakeholders and consumers, which can give a positive effect on the company's reputation.

The next recommendation is addressing to Albert Heijn. Based on the result and conclusion, the researcher found Albert Heijn still lack on the packaging. Instead of using less packaging, the researcher would like to recommend to improve their packaging, especially to change their plastic materials into eco-friendly plastics such as cassava plastic bags that are easy to recycle and dissolve. Because as a retail company, Albert Heijn only can persuade customers to use less packaging, but the decision is on consumer's hand. Therefore, by using eco-friendly packaging, Albert Heijn can reduce their food waste and gain the customer's awareness of packaging, especially plastics.

Moreover, the researcher also would propose to Albert Heijn to raising awareness by educating the employee. Educating employee at the beginning of careers is right, however, the situation keeps changing, followed by the current situation of supply chain trends and climate changes. Therefore, continuous training about food waste must be provide due to the changes in trends. It might be the training of the newest technology how to storage and

handling food to keep the freshness of the products and make the product have a long lifetime.

In the end, there is two recommendation that the researcher would like to give for future research. Future research should evaluate which action has the most effective in reducing food waste in the European Union. Last, further research is required to provide the effect of waste management policies in the United Kingdom and the Netherlands to their retail company if Brexit positively happen.

In this research, the researcher would also like to mention some limitations of this research. The limited of previous study becomes the main limitation of this research. There only a few scientific journals that conducted in retail companies. Specifically, only two up to three scientific research conducted in Tesco and Alber Heijn. Therefore, the researcher's knowledge of food waste management in retail companies is limited. The researcher would also like to mention that more research regarding food waste management in retail industries would be needed to further sustainable development and also because the problem is currently happening.



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