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ENVIRONMENTALLY SUSTAINABLE SUPPLY CHAINS IN FOOD RETAIL INDUSTRY

– case K Group

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The purpose of this thesis is to study the methods for increasing environmental sustainability of food retail industry and the activities that have already been taken to reduce supply chain environmental impact. This was achieved by the use of a case study analyzing the supply chain of K Group. Kesko sustainability report 2020 was used as a source for secondary information for the case study. Based on the theory and current practices at K Group, two new sustainability practices are then suggested.

The research for this thesis consists of two parts. The literature review examines the theoretical background of sustainable business practices, supply chains and the food retail industry. The second part examines the information provided by K Group regarding their environmental policies. Based on this research, an analysis is created and the need for new policies identified.

The findings of the research result in identifying the need for a store selection with an overall lowered impact on the environment, and an effective method to communicate the levels of food sustainability to customers. Choice editing by limiting the amount of meat products sold at K Group stores and environmental labeling to better inform customers of products' environmental impact are suggested.

Anu Laurila

YMPÄRISTÖN KANNALTA KESTÄVÄT TUOTANTOKETJUT ELINTARVIKELIIKKEISSÄ

- Case K-Ryhmä

Tämän lopputyön tarkoituksena on tutkia keinoja, joilla elintarvikemyymälät voivat muuttaa toimintojaan kestävän kehityksen mukaisiksi ja toimia, joita on jo otettu käyttöön ruoan tuotantoketjun ekologisen jalanjäljen pienentämiseksi. Tämä toteutettiin case study -menetelmää käyttäen analysoimalla K-ryhmän tuotantoketjua. Informaatio K-ryhmän toimintatavoista kerättiin käyttäen Keskon vastuullisuusraporttia vuodelta 2020. Teorian ja nykyisten K-ryhmän toimintamallien pohjalta ehdotetaan käyttöönotettavaksi kaksi uutta vastuullisuustoimenpidettä.

Tämän lopputyön tutkimus sisältää kaksi osaa. Kirjallisuuskatsaus tutkii teoreettista pohjaa ympäristön kannalta kestävän kehityksen mukaisista liiketoimintamalleista, tuotantoketjuista sekä ruoan suurmyymälätoiminnasta. Toinen osuus tarjoaa katsauksen K-ryhmän ympäristövastuullisuustoimenpiteisiin. Tämän tutkimuksen perusteella tulokset analysoidaan ja havaitaan tarve uusille toimenpiteille.

Tutkimuksen tuloksista päätellään tarve ekologisemman tuotevalikoiman luomiselle ja vastuullisuustiedon paremmalle asiakaskommunikoinnille. Ehdotetut ratkaisut ovat valikoiman rajaus vähentämällä myynnissä olevien lihatuotteiden määrää ja ympäristömerkintäjärjestelmän luominen asiakkaiden vastuullisten ostopäätösten mahdollistamiseksi.

ASIASANAT:

Vihreä talous, kestävä kehitys, elintarvikeketjut

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1 INTRODUCTION

1.1 Background

Sustainable business practices are becoming increasingly common as the impact of our current lifestyle on the climate crisis and global habitat destruction is becoming more evident. Instead of simply focusing on increasing profits, more and more companies are designing their operations to benefit all stakeholders from their customers and employees to the surrounding communities, suppliers and the planet (Bonini & Görner 2011; Whelan & Fink 2016). To get a better understanding of the effects that a company has on the environment, it needs to analyze the whole supply chain of its products from the sourcing of raw materials to production and finally to their customers and the end-of-life treatment of products.

In choosing my thesis topic, I wanted to take a closer look at sustainability in business and what is currently being done in the Finnish business environment to lower carbon emissions and increase resource efficiency. I believe that this topic is important and relevant to today's discussion of sustainable business practices, and will become even more relevant as new laws and regulations regarding emissions are set. I believe that the companies that invest in creating truly sustainable supply chains will not only have an advantage as they are better able to adapt to the changing customer expectations, but will also experience increased financial success as a result. I chose to limit my study to only environmental sustainability, and to approach the case company's operations from a supply chain perspective. This method allowed for a more detailed look into the life cycle of the company's product offering from the suppliers to the delivery processes and then to the customers. As each stage of a supply chain has unique challenges to sustainability, the solutions should also be analyzed with this in mind.

The target company of the case study is K Group, the food retail division of Kesko. The company was chosen not only because K Group is Finland's second largest food retailer, but also for their dedication to introduce environmental business practices as a part of their daily operations. These values and the way they are incorporated into practice by a company who's operating profits are growing steadily while the overall carbon footprint is decreasing (Kesko 2020a; Kesko 2020b) provide an interesting example of how doing

good for the company's bottom line and doing what's good for the planet can be achieved simultaneously.

1.2 Goals and research questions of the thesis

The objective of this thesis is to provide information on the current sustainability methods of the Finnish food retail industry. This is achieved by analyzing a food retail company's supply chain and examining how it matches with current theory about sustainability in business. Based on these findings, new tools are then suggested to help further promote environmentally sustainable business practices in the case company.

My research questions for this thesis are:

1. How can food retailers increase environmental sustainability in their supply chain?

2. How do the K Group stores implement environmental sustainability in their operations?

3. What tools could K Group use to increase the level of environmental sustainability in its supply chain?

The research methodology used in this thesis is a case study. The data collection method used is secondary information collected from the Kesko annual sustainability report. The methods and data sources were chosen after several attempts at collecting primary data with the use of an interview failed due to scheduling conflicts. The annual report was then chosen as a second option: the wide availability of information within K Group's sustainability reporting and the efficiency of a secondary information source made this an acceptable information source in place of an interview.

Some limitations are identified with this research methodology. As all the data used is secondaty data sourced from K Group's own reporting it is somewhat one-sided and biased. The restriction of the thesis topic to environmental sustainability also excludes social sustainability, an important topic for research and a common subject of criticism towards companies in food retail.

1.3 Thesis structure

This thesis is divided into five parts. The thesis begins with an introductory section covering the motivations and research methods for the thesis. This is followed by a review of current literature on the topics of sustainable business practices, supply chains and food retail industry. The third section introduces the environmental sustainability efforts of the case company K Group as presented in their sustainability report. These activities are then analyzed in the fourth section, where new sustainability tools are suggested to improve the sustainability at K Group. Finally, a conclusion chapter summarizes the findings and the need for further study is discussed.

2 LITERATURE REVIEW

2.1 Environmentalism and sustainability in business

2.1.1 History of environmentalism

The Earth is going through a climate crisis unlike anything we have ever seen before. The climate is warming at an increasingly rapid speed (Masson-Delmotte et al 2018) and biodiversity is threatened all over the world (Grooten & Almond 2018). This is caused largely by the massive impact that human consumption and the demand for products and raw materials has on the planet (Grooten & Almond 2018; Masson-Delmotte et al 2018). The current development is predicted to cause massive threats to life as we know it with intensifying extreme weather phenomenon, sea level rise and an increase in the number of people living in poverty (Masson-Delmotte et al 2018).

The traditional belief in the world of economics has been that the most important task for a business is to create profit for its shareholders; a principle often referred to as the Friedman doctrine. Friedman (1970) argued that because a firm is socially responsible only to its shareholders, maximizing their returns should be a firm's primary goal. This became the dominant belief in the business world, and was only widely questioned after the 2008 financial crisis (Lipton 2020).

In today's business climate it is recognized that to have any hope of slowing the climate crisis it is necessary for large companies to take part in the effort of slowing emissions, and companies perceive environmental sustainability risks as a major threat to their operations (Giannakis & Papadopoulos 2016). This has led to the rise of stakeholder capitalism and the concept of triple bottom line, where business performance is measured by taking into account the people, planet and profit equally (Pullman & Sauter 2012, 2).

Sustainability can be defined as the ability to fulfill the needs of the present without risking the ability of future generations to fulfill their needs (United Nations 1987). The concept

of sustainability as it is understood today consists of three levels: environmental, social and financial sustainability (Pullman & Sauter 2012, 2).

Environmental sustainability considers the effects that business practices have on the climate and ecosystems. While the concept of environmental sustainability is easily understood and supported by companies, executing it can be challenging as these processes are unique to each field and require long term planning. The need to justify environmental actions with a business case can slow the adaptation of new ways of operating. (Pullman & Sauter 2012, 12)

Social sustainability deals with fair treatment of all people affected by the business: from providing safe working conditions and preventing the use of child labor in subcontracting partners, to preventing discrimination and harassment at the workplace. Monitoring the level of social sustainability at different levels of the supply chain can be a challenging task: often raw materials producers and early stage manufacturers overseas are not directly employed by the company and labour standards become difficult to enforce. To help manage this process, tools such as supplier scorecards and third party certifications are increasingly common and can help companies keep better track of the social sustainability throughout their supply chain. (Pullman & Sauter 2012, 3-8)

Financial sustainability focuses on ensuring that a company maintains its financial success and resilience that allows for growth and stability. While the need for measuring financial success has always been recognized by corporations, the theory of sustainable business suggests that financial sustainability is connected to the environmental and social issues, and that all three are required to create a truly sustainable business. (Pullman & Sauter 2012, 2-13)

2.1.2 Benefits of sustainable business practices

While some companies still today might see this push to sustainability as harmful to their bottom line, in many industries sustainable businesses are already more profitable (Clarck et al 2015; World Economic Forum 2011). There are often initial costs of adopting sustainable practices, but these will likely lead to increased profits in the long term (Haanaes et al 2013). The main financial reasons for a corporation to move to a more sustainable operations include adhering to changing regulations, gaining customer loyalty and increasing reputation, and cost savings from resource efficiency and process

improvement (Epstein 2008, 21-22). Measuring the direct financial effect of sustainability initiatives can be challenging, but an important step in ensuring the effectiveness of sustainability initiatives (Epstein 2008, 143).

Compliance with existing and future regulations

For many companies, the main push towards sustainability activities is the adherence to existing laws (Epstein 2008, 104). To encourage companies to make sustainable choices, both individual governments and the EU have set emission targets and regulations (United Nations 2015; Valtioneuvosto 2019). In the global scale, multinational treaties such as the Paris Agreement of 2016 aim to create a joint multinational effort to limit worldwide temperature increase by limiting emissions, protecting carbon sinks and increasing climate awareness (United Nations 2015). The finnish government has set a goal to reach carbon neutrality by 2035 (Valtioneuvosto 2019). This means that companies operating in Finland will also have to gradually lower their emissions and move to green energy sources (Valtioneuvosto 2019). New laws and regulations regarding emissions and sustainability are expected to emerge in the coming years and shifting business practices to a more sustainable way gives companies an advantage (Granat 2020).

New customer segments and positive brand impact

Consumers are increasingly interested in the sustainability of companies when making their purchasing decisions: as the awareness of environmental concerns grows among consumers, an increasing number of people are willing to pay more for green products (Pullman & Sauter 2012, 14). Both positive and negative sustainability actions often reach the attention of the general public and have an immediate impact on the way the company is perceived (Burke & Logsdon 1996; Whelan & Fink 2016). Positive brand effect means that the sustainably motivated consumer base is reached, which can lead to an increase in market share (Epstein 2008, 251). The increased attention to sustainability practices can also result in access to completely new markets (Epstein 2008, 251).

Increased efficiency and innovation

Changing corporate business practices to a more sustainable direction requires rethinking and re-evaluating all processes and stages of production: this can lead to process and product innovation (Clarck et al 2015). Rethinking the way business is conducted sustainably can even lead to new innovative business ideas (World Economic Forum 2011; Whelan & Fink 2016). There are also several ways in which sustainability practices can directly lower operating costs, such as increased energy efficiency, decreased consumption of raw materials and waste minimization (Epstein 2008, 251; Whelan & Fink 2016).

Risk reduction

Climate change poses a risk to businesses because of the dependence on natural resources and global supply chains in their production chains (Grooten & Almond 2018). Companies identify the effects of climate change as a major threat to their operations (Giannakis & Papadopoulos 2016).

Giannakis & Papadopoulos (2016) identify three types of risk associated with sustainability: environmental, social and financial. Environmental risks include risks such as pollution, unproductive use of energy and water scarcity. Child labor, discrimination and unethical treatment of animals are examples of social risks. Financial risks consist of acts such as bribery, tax evasion and boycotts. (Giannakis & Papadopoulos 2016)

These risks can be further divided to endogenous and exogenous risks: those that are a direct result of company's operations and management decisions, and those that are a result of environmental circumstances and cannot be controlled by the company (Giannakis & Papadopoulos 2016). While risks associated with climate change, such as flooding or drought, often cannot be predicted and are out of organization's control, by investing in processes that ensure sustainability in the long term, these risks can be mitigated (Whelan & Fink 2016).

Engagement of all stakeholders

Instead of simply aiming to create profit for shareholders, sustainable business practices are able to engage all stakeholders by creating additional value to the surrounding communities, suppliers, employees and the environment (Whelan & Fink 2016). Traditional stakeholders can also benefit from a shift towards sustainability, as it has become an important trend in the financial market. Sustainability has been shown to have a positive impact on a company's stock price (Clark et al 2015). Sustainability can also lead to better employee satisfaction: by creating a safer and more supportive work environment, sustainability activities lead to higher employee satisfaction and therefore a lower turnover rate of employees for the company, reducing the costs associated with hiring and increasing employee motivation (Perrini et al 2006, 73; Epstein 2008, 251).

2.1.3 Corporate social responsibility

Increased attention to the climate crisis and social issues has put an increased pressure on companies to engage in activities that not only boost their bottom line, but that benefit the surrounding communities, their employees and the environment. The European Commission (2019) defines corporate social responsibility as "the responsibility of enterprises for their impacts on society". In other words, corporate social responsibility consists of the activities of a company that go beyond what is legally required to promote a sustainable development, and should include all three aspects of sustainability: the environment, the economy and social responsibility (McKinnon et al 2015, 112).

Companies are driven to increasingly further their corporate social responsibility policies by increased concern from consumers and investors who often use sustainability as a criterion in their investment decisions, the increased knowledge and data about the climate crisis and the effect our current way of doing business has on the environment, and increased transparency whereby the sustainability of a company's processes is brought to attention of the general public by social media and the press (European Commission 2001). By practicing corporate social responsibility, companies can better engage all the stakeholders of their company; a better brand image attracts more customers, employees are more motivated to work for a company that shares their values, and decreased operating costs and increased market share can appeal to investors (Kotler & Lee 2005, 11-18).

The policies created to increase corporate social responsibility should be integrated through all areas of business through the value chain, from how the products are designed, where the materials are sourced and all the way to the employee selection process and marketing decisions (Perrini et al 2006, 5-6).

2.2 Environmentally sustainable supply chains

In order to incorporate sustainability to company's operations, all stages of the supply chain should be considered (Epstein 2008, 90). A supply chain is defined as the network that is created to facilitate a flow of goods from raw materials stage all the way to the customer as a finished product (Bozarth & Handfield 2008, 4). This flow of physical products, information and money often connects several different companies and the flow moves in both directions of the supply chain. To analyze the supply chain from the point of view of a single company, the supply chain activities can be divided to upstream and downstream activities: upstream is the processes taking place earlier in the supply chain from the case company's perspective, such as raw materials, whereas downstream describes the activities later in the supply chain (Bozarth & Handfield 2008, 4-7). To manage these flows and intercorporate relationships, a good supply chain management process is required from the company (Bozarth & Handfield 2008, 8).

| Raw material suppliers | → | Manufacturers | → | Distributors | → | Retailers | → | Customers |

Figure 1. Basic supply chain (Chopra & Meindl 2010, 21)

At the start of a supply chain is the raw materials supplier. Once the raw materials are collected and processed ready for transport, they are then shipped to manufacturers that take the raw materials and refine them further. There can be several stages of manufacturers that a product goes through before moving further in the supply chain: the supplier that the company deals with is referred to as a first tier supplier, and the further suppliers are referred to as second tier suppliers. The same principle applies to the different tiers of customers at the end of the supply chain. (Grant, Tautrims & Wong 2017, 10).

World Economic Forum (2009) has identified thirteen main tools for companies to decrease the amount of carbon in the supply chain processes: Clean vehicle technologies, despeeding the supply chain, enabling low carbon sourcing in agriculture, optimizing networks, energy efficient buildings, packaging design initiatives, enabling low carbon sourcing in manufacturing, training and communication, modal switches, reverse logistics and recycling, nearshoring, increased home delivery, and reducing congestion.

Decarbonization Opportunity	Description
Clean Vehicle Technologies	Introduce clean and environmentally efficient technologies
Despeeding the Supply Chain	Decrease transport speed and increase load fill
Enabling Low Carbon Sourcing: Agriculture	Optimise the location of agriculture
Optimised Networks	Improve network planning through transformation projects
Energy Efficient Buildings	Minimise emissions from operating activities
Packaging Design Initiatives	Reduce weight and volume of packaging
Enabling Low Carbon Sourcing: Manufacturing	Optimise manufacturing location
Training and Communication	Provide training to road transport contractors and building operators
Modal Switches	Transfer freight from air and long-haul road freight to ocean, road and rail freight
Reverse Logistics / Recycling	Improve percentage of total supply chain waste which is recycled
Nearshoring	Transfer long-haul air and ocean freight to road and rail freight
Increased Home Delivery	Rely on alternate transport services to deliver goods home
Reducing Congestion	Introduce traffic management techniques

Figure 2. Decarbonization opportunities ranked by effectiveness (World Economic Forum 2009)

2.2.1 Upstream sustainability

The upstream sustainability processes consist of activities that take part in the first stages of the supply chain before goods and products reach the store. These include the selection of suppliers and manufacturers, the transport and logistics processes, and warehousing.

Due to the globalization of supply chains and the trend of offshoring manufacturing to lower cost countries, it is important to include sustainability in the purchasing process (Pullman & Sauter 2012, 80). A sustainable purchasing model as suggested by Pullman and Sauter (2012, 80) consists of four stages: firstly, a company must decide on a concrete set of expectations and goals for their suppliers. In the second stage, the suitable suppliers are contacted and the use of a possible sustainability certification

program is agreed upon. At this stage, the company can either choose suppliers that already meet their sustainability demands, or work with suppliers to create new processes that enhance the level of sustainability. In stage three, the level of sustainability continues to be evaluated and tools for managers to evaluate the process are established. Finally, once the supply chain is fully established, sustainability data must be continuously gathered to evaluate the success of the process and to find potential areas of improvement.

Similarly, taking environmental sustainability into account already on the product design phase is an important step to ensure that the end product is resource efficient, long lasting and recyclable. Designing for sustainability starts with raw materials selection: if using recycled materials is not feasible, choosing to source from reputable suppliers and certified sources can help lower the carbon footprint of a product. (Grant, Trautrims & Wong 2017, 122-123)

Transportation of goods has a significant role in the carbon footprint of supply chains: The single most significant way to reduce supply chain carbon emissions is to reduce the consumption of fossil fuels with the introduction of clean vehicle technologies and alternative fuels (World Economic Forum 2009). According to the World Economic Forum (2009), the amount of emissions from the transportation sector worldwide is 2 800 mega-tonnes: in total, transportation activities make up about 5 to 15 percent of total product life cycle carbon footprint. The largest single contributor is road transport, which accounts for 57 percent of the emissions, while the least carbon intensive modes of transport are rail and ocean freight. (World Economic Forum 2009) It is also worth taking into account that besides high carbon emissions, road transport is also responsible for increased noise pollution and road accidents that impact the lifes of people near heavily used transport routes (Grant, Trautrims & Wong 2017, 66). Road freight is the easiest to renew and has been transitioning to green technologies quicker than other transport methods (McKinnon et al 2015, 188)

In certain cases it is worth considering whether changing the mode of transport could help reduce the emissions in the supply chain, for example from road freight to rail. When access to rail roads or shipping ports are not available for the whole supply chain, a multimodal transport may need to be considered: this process of combining different transport methods has been made easier through the use of standardized shipping containers and palettes. (Grant, Trautrims & Wong 2017, 73-74)

To promote decarbonization of global supply chains, significant shifts in the political and business environments are required. The key individual steps currently furthering environmental sustainability of supply chains include carbon emission regulations, the increase and unpredictability of fuel prices, and the demand from consumers and shareholders for carbon efficiency (World Economic Forum 2009). Internalization of environmental costs, a process where the damage caused to the environment from transport and manufacturing processes is calculated and paid for by the polluting company, is also an important regulatory tool to help companies understand and minimize the environmental impact of their supply chains (McKinnon et al 2015, 82-85).

The concept of nearshoring has developed as a response to increasingly longer supply chains caused by offshoring. Nearshoring refers to the act of moving some or all of the production in the supply chain closer to the end consumer. While there are often financial incentives for manufacturing in low income countries, this can often lead not only to a difficulty in communication throughout the supply chain but also to increased risk and higher transport emissions. Nearshoring can help to address these concerns, and often the increase in costs due to higher wages is compensated by the savings from lowered transport costs, higher quality of products and the decreased lead time through the supply chain. (Grant, Trautrims & Wong 2017, 74-75)

There is a need for some form of warehousing in almost all supply chains. Even though the carbon footprint of warehousing is not large compared to transportation, it is important to also take into account in the effort to lower the emissions of a supply chain. (Grant, Trautrims & Wong 2017, 92-95) To reduce the emissions of warehousing, a company can choose to minimize the need for excess long-term warehousing with policies such as just-in-time, where the amount of inventory is minimized (Jacobs & Chase 2011, 50). Where the need for large scale warehousing still exists, the carbon footprint can most effectively be addressed by building warehouses with sustainable processes and materials, lengthening the life span of existing warehouses by using them as long as possible, and optimizing the energy consumption of existing warehouses with energy efficient fixtures and using renewable energy sources. (Grant, Trautrims & Wong 2017, 101-108)

2.2.2 In-shop sustainability

In-shop sustainability consists of all the activities taken to reduce the carbon footprint of a company's buildings and in the work methods of its employees. Energy efficiency of buildings and facilities is one of the most feasible ways for companies to reduce their emissions (World Economic Forum 2009; European Comission 2009). It is also important to focus training efforts for employees, and promote sustainable methods for commuting and business travel (World Economic Forum 2009).

2.2.3 Downstream sustainability

Downstream sustainability activities consist of product end-of-life management and customer use of products. What customers choose and how they commute to the store or receive their goods is an important factor to consider in analyzing supply chains. Sustainability of marketing and advertising activities should also be analyzed.

Once a certain product has reached the end of its use by the end customer, it is typically discarded. As products are made increasingly cheaper and shipped longer distances thus increasing the need for packaging materials, the problem of waste has become an increasingly growing issue globally. This has led to increased attention towards improving ways to reduce, reuse and recycle end-of-life products and raw materials. Companies are expected to not only manufacture products that last longer and create less waste, but to take an active part in dealing with the end-of-life processes of their products. (Pullman & Sauter 2012, 119-110)

Reduce

Reuse, remanufacture etc
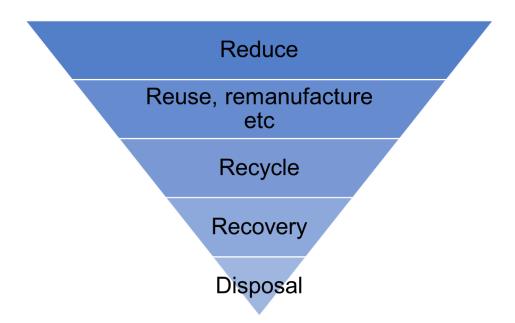
Recycle

Recovery

Disposal

Figure 3. Hierarchy of waste management (Grant, Trautrims & Wong 2017, 183)

The main driver of increased regulation towards end-of-life management of products is environmental sustainability: simply discarding products in a landfill does not only take up valuable land area but also means that valuable and often rare raw materials are taken out of circulation and have to therefore be newly sourced, increasing deforestation and the use of fossil fuels. (Pullman & Sauter 2012, 111)

In certain cases the most efficient way to recapture any possible value or to properly dispose of a product is to have it returned back up to the manufacturer earlier in the supply chain in a process known as reverse logistics. (Grant, Trautrims & Wong 2017, 24-25) Once a used product has made its way back up to the manufacturing company they can then either choose to repair the product, cannibalize it for valuable parts, recycle it accordingly, or, if possible, to upcycle it: in upcycling, a used product is redesigned into something new that is more valuable than the original product. (Grant, Trautrims & Wong 2017, 186-188) These processes are however dependent on the recyclability of the product, the value of the parts and wether a market exists for used products or parts: these factors often determine the willingness of a company to develop a closed loop process (Pullman & Sauter 2012, 115). Collecting the used products can be done by use of a deposit fee, take-back schemes, trade-in models, pick up systems or public recycling centres. (Grant, Trautrims & Wong 2017, 190-191)

The perceived cost of reverse logistics activities can prevent companies from proactively developing these processes: the transport costs alone of shipping used products has the

possibility to make companies view the process financially unappealing. From a managerial perspective, the difficulty of calculating the benefit-cost ratio associated with closed-loop supply chains can slow their adoption. The potential financial benefits of sustainability are however especially prominent in end-of-life considerations if developed properly, with companies having the possibility to reduce their materials costs, improve brand image and manage with increasing legislation considering recyclability and waste (Ferguson et al 2010, 10, 13).
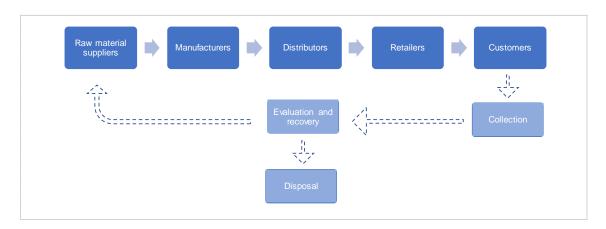

Figure 4. Closed loop supply chain model (Adapted from Grant, Trautrims & Wong 2017, 122)

Moving towards a more circular economy has been suggested as a solution to tackle the constantly increasing raw material consumption and waste creation (Ellen MacArthur foundation 2019). Unlike in the current linear economy where you take raw materials, make a new product, and after the product is no longer needed it becomes waste, in a circular economy, the need for new materials is reduced to a minimum as raw materials are reused and products are designed to be sustainable from the beginning (Ellen MacArthur foundation 2019). Applying the methods of circular economy and encouraging local businesses to a more circular system is recognized as an important goal in the move towards sustainability by the European Union and the Finnish Government (European Commission 2018;Valtioneuvosto 2019). While the shift from a linear consumption model to a circular one is expected to be slow, it would address many of the problems of end-of-life management of products and resources while at the same time limiting the need to continuously add new materials to circulation, and is therefore an important part of the effort to increase the sustainability of supply chains. (Ellen MacArthur foundation 2019)

2.3 Food supply chains

There are several characteristics that differentiate food supply chains from other forms of consumer products. Challenges unique to this industry include the need to maintain cold chains, the quick perishability of goods, the unpredictability of supply and the effects of climate and weather on supply. Unlike most other goods, if food is not stored and handled properly all across the supply chain, it can in some cases be dangerous to consume. Despite all these issues, food is a necessity all over the world that needs to be provided in a steady, predictable supply and is an important priority for governments all over the world. (Eastham et al 2017, 3-4)

One of the main challenges facing food retail is the need to maintain cold chains throughout the supply chain. While maintaining the right temperature both in transit as well as in storage is a complicated and demanding process, it is important to keep the food products in optimal condition for customers (Bourlakis & Weightman 2004, 180). This temperature control can mean higher costs for the company in the form of increased energy consumption (Bourlakis & Weightman 2004,192). This process is highlighted as the demand for temperature-controlled food, such as frozen goods, is increasing (Bourlakis & Weightman 2004, 181).

In recent years, food supply chains have grown larger and more complex while concentrating to fewer companies (Eastham et al 2017, 3-9). This concentration can be seen in the retail side as well as economies of scale favour bigger, fewer stores (Bourlakis & Weightman 2004,122). There has been debate in the food industry about the sustainability of long supply chains compared to local food production: often when promoting sustainability, companies will use locality of their food supply as a key marketing strategy and equating it with low carbon footprint, mainly due to the lowered emissions of transportation (McKinnon et al 2015, 358).

According to Putnam et al (2021), even though food retailers have the largest opportunity to lower emissions from food production and distribution, the industry has been slow to adapt changes in response to climate change. Consumer pressure has been a key factor in the slow change towards more sustainable food retail practices (Putnam et al 2021). Direct emissions are easier to address by the company, whereas lowering indirect emissions often requires complex cooperation of different actors along the supply chain (European Commission 2009).

3 RESEARCH METHODOLOGY

The research in this thesis consists of qualitative research in the form of a case study to provide a more detailed understanding of sustainable food retail supply chains. The use of a case study will provide a practical example of the theories being applied in practice by looking at the practices of a single company.

An interview was considered as the primary source of information for this thesis, however due to scheduling conflicts this was not possible to execute. Subsequently, secondary data collection was chosen as a source of information on the case study company. The benefits associated with using secondary data consist of time and cost savings, however using only secondary sources there is no control over the quality or the biases of the data from its publisher (Saunders et al 2019, 351-355).

The secondary data in this thesis is collected from the published documents of the case company's own reporting in the form of annual reports. This data has the advantage that it contains more detailed information collected from a longer time period than would have been possible for me to achieve using primary research methods such as an interview. Some disadvantages are also recognized with using a secondary data source from the case company itself, as the reliability and biases of the data are more difficult to evaluate. (Saunders et al 2019, 351-355)

4 CASE STUDY: K GROUP

4.1 Introduction of company

K Group is Finland's second largest grocery trade chain comprising of K-Citymarket, K-supermarket, K-market and Neste K stores. K Group is a part of Kesko: besides its grocery stores under K Group, Kesko also runs car trade and building and technical trade. In 2020, K Group had an operating profit of 375,2 million euros. Each store is run by an independent retailer and in total, K Group has 1 236 grocery stores in Finland with a 6 197 personnel. (Kesko 2020a) Gaining recognition for their efforts to create a customer oriented and sustainable grocery experience, in 2016 K Group was chosen as the most sustainable food retailer in the world (Corporate Knights 2016) and in 2019, one of their locations K-Citymarket Järvenpää was chosen best grocery store of the year (IGD 2019).

K Group recognizes sustainability as one of the key components of their strategy, and their board of directors have made combatting climate change a key strategic focus area. Environmental sustainability is enforced increasingly in the purchasing decisions in the early stages of the food supply chain, the transportation of goods, in the day-to-day operations of individual stores and in increasing customers to make decisions that lower their carbon footprint. K Group has set a target to be carbon neutral by 2025 and completely emissions free by 2030. (Kesko 2020b)

Figure 5. Emission sources for Kesko (Kesko 2020b)

Climate change related hazards are recognized as a big risk factor in the continuing operations of K group, both due to changing regulations but also extreme weather phenomena causing potential disruptions to global food chain logistics. K Group also recognizes that customers are increasingly demanding more environmental sustainability from their food purchases. (Kesko 2020b)

K Group has identified six different main strategic actions to support their sustainability vision:

Figure 6. Kesko strategic actions for sustainability (Kesko 2020b)

Of these six actions, strengthening transparent sourcing can be identified as promoting upstream sustainability. Circular economy solutions, communal responsibility initiatives,

and aiming for carbon neutrality are a part of the effort to improve in-shop sustainability. Commercialization of sustainability and data-based services make up downstream sustainability.

4.2 Upstream sustainability

The largest emissions source in all K Group emissions with 78 percent is the production of products sold. The environmental sustainability of global supply chains is an important factor in the sourcing decisions at K Group. One key strategy to monitor global suppliers is by using third-party certifications and assessments to evaluate the sustainability actions: these include the ISO 14001 certification, IGS Environmental Assessment, and globally recognized certificates such as fairtrade and UTZ certification. Kesko has also implemented CDP Supply Chain programme for reporting emissions levels. (Kesko 2020b)

K Group has identified six key individual raw materials in their supply chain that are of particular interest in their sustainability policy: soy, cocoa, cotton, timber, palm oil and fish and shellfish. Each of these products is individually monitored and has an increased set of requirements expected from producers. (Kesko 2020b)

4.2.1 Logistics activities

Fuel consumption from logistics activities is recognized by K Group as one of the main sources of direct emissions of its own operations (Kesko 2020b). K Group aims to reduce the impact of their logistics activities by improving their efficiency through the use of centralised distribution, optimisation of delivery routes and high volumetric efficiency. Two electric trucks are currently in use in Helsinki region. K Group is also providing training for its truck drivers in energy efficient driving methods. (Kesko 2020b)

4.3 In-shop sustainability

As the second largest grocery chain in Finland, K Group has a large number of stores around the country. Due to the demands of refrigeration and long opening hours, high energy consumption is one of the biggest contributor in the stores' carbon footprint.

Reducing carbon emissions by choosing renewable energy sources and implementing energy-efficient practices inside the stores are identified as key steps in increasing environmental sustainability of the K Group. Since 2017, all electricity used by K Group stores has been from renewable sources. K Group is also in the process of piloting completely carbon neutral stores: the model is currently in use in three K Group locations and is being expanded further. (Kesko 2020b)

The main tools to increase energy efficiency in stores consists of improvements to lighting and refrigeration and the production of solar power. K Group is updating the lighting and refrigeration systems in stores to help reduce energy consumption, and their stores currently have 42 solar power plants that provide energy particularly in the summer when energy consumption is at its highest. (Kesko 2020b)

One of the main sources of emissions from K Group's own operations comes from the electricity and heat use in their properties. To address this, K Group has piloted a heat circulation system that uses the heat created as a byproduct of refrigeration to provide heat for its stores: this process is already in use in 20 locations and if replicated to all store locations, could reduce the amount of energy needed for heating by up to 95 percent. (Kesko 2020b)

4.3.1 Offices and employees

K Group promotes sustainable employee commuting in its headquarters, by providing shared bicycles and facilities for bicycle parking. The emissions from K Group headquarters were significantly lowered with the reduction of business travel in 2020: this was however in large part due to the COVID-19 pandemic.

4.4 Downstream sustainability

To enable more sustainable purchasing decisions for their customers, K Group encourages customers to choose more plant based foods in their grocery choices. The main activities to achieve this result include separate veggie shelves dedicated to vegetarian and vegan protein products, vegetable-related campaigns and adding new fruits and vegetables to the stores' selection. (Kesko 2020b)

To help customers better understand and analyze their own carbon footprint resulting from their grocery purchases, K Group has introduced a carbon calculator available for its customers through their K-ostokset application (Kesko 2020b).

Two percent of all K Group indirect emissions is from shopping commutes of customers. By introducing charging sations for electric cars located at local grocery stores, K Group is encouraging more environmentally sustainable choices for their customers. All electricity used in these charging stations comes from Finnish wind power. (Kesko 2020b)

4.4.1 Waste

Food waste reduction is addressed at K Group by adapting the selection and optimizing the supply with customer needs. K Group has also invested in improvements to packaging, staff training and a focus on logistics. To prevent food waste from products past their expiration date, K Group stores offer discounts on items nearing their best before dates to promote their sales. Certain foods removed form shelves are also being donated to charities or used as raw material for new products, such as creating juice from discarded vegetables. (Kesko 2020b)

K Group has set a goal of changing the packaging in private label products to be made recyclable, reusable or biodegradable by 2025. This is in line with the goal to achieve a more circular economy at K Group. Of all K Group stores, 664 locations are a part of a Circular economy agreement: these stores recycle 75 percent of produced waste. (Kesko 2020b)

K Group is enabling customer recycling by offering access to Rinki recycling points. Reverse logistics of K Group also include collecting recyclable cans and glass bottles. (Kesko 2020b)

Figure 7. Examples of Pirkka products with reduced plastic in packaging (K-ruoka 2021a)

Figure 8. Rinki recycling station for customers of K-Supermarket Mankkaa (Kesko 2016)

5 ANALYSIS AND SUGGESTIONS

5.1 Evaluating relevance and success of K Group sustainability initiatives

K Group has made environmental sustainability a high priority in its operations. While there are ambitious goals detailed in the sustainability report, there is still a need for more detailed methods and tools to achieve these goals. Areas of improvement can also be found in the lack of sustainability measures for all products in the selection, when only individual product groups are under environmental requirements and concrete measures and third party review systems are not implemented for all products.

Largest source of emissions for K Group is the production of products sold: this accounts for 78 percent of all emissions (Kesko 2020b). To address their emissions, K Group should focus most of its efforts to supplier selection. In the sustainable purchasing model suggested by Pullman and Sauter (2012, 80), the importance of meaningful expectations and the continuous measuring of performance is highlighted. While according to K Group's own reporting "K Group also encourages its suppliers, the whole supply chain and its customers to take measures to reduce emissions" (Kesko 2020b), there exists a lack of concrete tools and measures to support this statement. Only individual products, such as cotton under K Group's Cotton policy (Kesko 2020b) are more closely monitored.

Limiting fossil fuel use has been suggested as one of the most effective tools in reducing supply chain emissions (World Economic Forum 2009). Besides the two electric trucks in use in the Helsinki region, K Group currently only uses diesel-fueled vehicles in its logistics operations (Kesko 2020b). This suggests a greater need in the efforts to decarbonize transportation activities.

Improving energy efficiency is the most popular and viewed as the most easily achievable environmental practices among retailers: this is also motivated by the financial savings achieved from reducing energy consumption (European Commission 2009). Energy efficiency policies are widely adopted by K Group and innovative new methods to reduce energy consumption at stores have been developed: the efficiency of these actions are however limited by the high number of stores and the lack of consistency among them. For example the heating circulation system that is said to limit the energy use of heating by 95 percent is only currently applied to 20 store locations. (Kesko 2020b)

Plant-based food has a lower carbon footprint than animal-based foods, and one of the most effective ways for an individual to reduce their carbon footprint is to switch to a more plant-based diet (Poore & Nemecek 2018; Sitra 2019; Almond et al 2020). K Group has several policies aimed at promoting the use of vegetables and plant protein products and is therefore in line with the current theory on the topic.

K Group has made attempts at providing their customers the ability to monitor the carbon footprint of their purchases through the K-ostokset application (Kesko 2020b). This process however has flaws: it only works for people using their K-Plussa card, only provides environmental information to those motivated enough to access the K-ostokset service and actively seek the information out, and only provides with the sustainability information after the purchase is made, not allowing for the possibility to make more environmental choices at the store.

Increased home deliveries were identified by the World Economic Forum (2009) as a method for lowering supply chain carbon footprint: the rise in K Group food delivery matches with this theory, and helps to reduce the impact that customers commuting to the store has on their carbon footprint. This tool is however only available to customers of certain areas. While the process of using food waste to create biogas is innovative, it is only being applied in less than half of all store locations, limiting its effects on the overall sustainability of K Group (Kesko 2020b).

Food and mobility are among the largest contributors to the Finnish consumer's environmental footprint (Nissinen & Savolainen 2019). Food retailers can help their customers make sustainable choices by promoting sustainable products, offering financial incentives for choosing sustainable products, and offering the consumer information about the sustainability of products (European Commission 2009).

5.2 Recommendations for sustainability initiatives

5.2.1 Choice editing: reduction of animal products

The term choice editing is used to describe the act of selectively reducing or eliminating certain products from the store selection: instead of simply relying on consumers to make educated decisions about their purchases, choice editing by retailers uses limiting the selection available and behavioural psychology tools in marketing and store design to

promote the purchasing of desired products (Sustainable Consumption Roundtable 2006). Historically, some of the most significant changes towards more sustainable consumption have come from regulations and manufacturers, as demonstrated by the regulations considering energy efficiency of home appliances (Sustainable Consumption Roundtable 2006). Choice editing is suggested for K Group because it would simultaneously address the carbon footprint of K Group and its selection, but also promote sustainable consumption for its customers.

One of the largest single contributors to humanity's ecological footprint is food production (Almond et al 2020). The vast majority of studies in this area point to meat overconsumption as the number one culprit in increasing the ecological damage and carbon emmissions of our food chains (Poore & Nemecek 2018; Sitra 2019;Almond et al 2020). Even the most sustainable sources of meat have a significantly higher carbon footprint than plant protein sources: animal production uses roughly 83 percent of all farmland dedicated to food production and is responsible for 56-58 percent of all food related carbon emissions, while providing only 18 percent of calories consumed (Poore & Nemecek 2018). This data suggests that in order to increase sustainability, a move to a more plant based diet is required globally.

It is estimated that Finnish consumers could reduce the carbon footprint of their dietary choices by reducing the consumption of meat: 13 percent reduction by cutting meat consumption in half, and a 37 percent reduction by moving to an all vegan diet (Saarinen et al 2019). In the current Finnish diet, meat and dairy consumption is responsible for 65 percent of the climate impact (Saarinen et al 2019). Reduction of meat and animal products would not only reduce the carbon footprint of Finnish consumers but would also have a positive impact on health (Virtanen et al 2011).

To help customers better adapt to the changes in product offering, significant marketing efforts are required: instead of highlighting what the consumer is missing by using terms such as meat-free, positive and comforting terminology should be favoured. Improved health benefits and lowered carbon emissions should also be highlighted in marketing. (Goodland & Anhang 2009)

As a part of its sustainability policy, K Group has implemented several policies to promote the purchase of vegetables and plant protein products (Kesko 2020b). K Group has also already implemented choice editing in removing the seafood deemed unsustainable by the WWF from its selections (Kesko 2020b). As the world meat consumption is already

in decline, and a growing number of people are reducing their consumption of meat for environmental reasons, severely limiting the amount of meat products sold would be in line with K Group sustainability goals and scientific data (FAO 2020; BEUC 2020).

In practice, to slowly reduce the amount of animal products in their selection and to promote sustainable consumption for its customers, three main tools are suggested: choice architecture, private label product redesign, and advertising.

Choice architecture

Choice architecture refers to the actions taken to promote a certain product without changing the price, but instead with how items are arranged and presented to consumers. Because people's food purchasing choices are mostly driven by habits, even subtle nudges to these patterns could drive significant results. (de Haan & Linde 2018) While choice architecture is often used to promote items that produce most profit, K Group should adapt a system of making the default choice available a plant-based one. These choice architecture actions would include reducing the size of the meat isles in stores, placing plant-based options to the shelves where they can be most easily accessed, and displaying plant-based items in easily accessed shelves and promotional displays.

Plant-based private label products

Making K Group's private label products under the Pirkka and K-Menu labels mainly plant-based would align with the current sustainability policies at K Group: promoting sustainability through their own brand products is already mentioned as one of key strategic actions towards sustainability (Kesko 2020b). It is therefore suggested that the food items sold under K Group private labels are redesigned to be produced using plant-based, mainly local ingredients. For example, instead of completely removing popular readymeals such as microwave-ready lasagne from its selections, this item could be redesigned to be produced using finnish broadbean as its main protein source.

Advertising

Focusing advertising efforts to feature mainly sustainable, plant-based produce would promote their use and help normalize these items. Well-designed marketing campaigns could also help customers react better to the change in store selection. Currently K Group store advertisements often heavily feature discounted meat items prominently as displayed in Figure 9: this does not align with K Group policies that highlight efforts to promote the use of plant-based products for its customers.

Figure 9. An example of a K-Citymarket advert (K-Ruoka 2021b)

5.2.2 Environmental labelling for reviewing supplier sustainability

The need for clearer communication of product range sustainability information was identified as a limitation of K Group sustainability efforts. To address this, the introduction of environmental labelling of food products is suggested. This tool combines both upstream and downstream sustainability efforts by encouraging a more detailed analysis of supplier activities, and by enabling customers to make more sustainable purchasing decisions. To increase the reliability of labelling, the levels of sustainability for each product should be decided by third party scientists to create an unbiased rating.

The policies taken by retailers and service providers aimed at guiding consumers to make better choices are known as nudging. Nudging implies not limiting the customer's choices, but instead guiding them with marketing, providing necessary and clear information about the products, and even retail architecture, such as the way products are placed in stores. These types of nudging activities have been positively received by European consumers, and are perceived as less intensive than for example choice editing, which limits consumer's options. Different types of nudging policies designed with behavioural sciences tools could work particularly well when it comes to food choices, as a lot of consumers' purchase behavour in this area are habitual and automatic: nudging mechanisms have already been successfully applied when promoting healthier eating habits. (Reisch et al 2017; Lehner et al 2016)

There has been extensive research that suggests a growing customer preference towards sustainable food choices (Seo et al 2016; Elsen et al 2019; Fromm 2020; BEUC 2020). Currently however it is almost impossible for a consumer to evaluate the sustainability of food when making the purchasing decision, and the difficulty of estimating the environmental footprint of food is a key barrier preventing sustainable choices (Mol & Oosterveer 2015; BEUC 2020). In a survey conducted by Saarinen et al (2019), 40 percent of producers in the Finnish food industry hoped for improvements in food environmental reporting practices.

In Finland, food constitutes about 15-20 percent of a consumer's greenhouse gas emissions (Virtanen et al 2011; Seppälä et al 2011; Nissinen & Savolainen 2019). Food retailers therefore have a large impact in helping consumers reduce their environmental footprint (European Commission 2009; Saarinen et al 2019). Despite this, of all sustainability practices implemented by retailers in Europe, one of the least used tools is

providing customers with sufficient knowledge about the sustainability of individual products (European Commission 2009). This is being addressed by the rise of environmental labelling as a growing trend in the food industry (Fromm 2020).
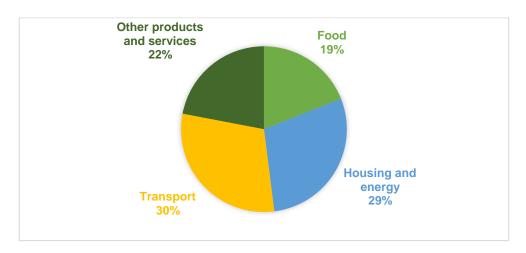

Figure 10. Average carbon footprint of Finnish consumer (Nissinen & Savolainen 2019)

Environmental labelling is already in use in other areas of retail, such as home appliances (European Commission n.d.). This has been done in part by mandatory regulation to help provide transparency and to enable customers to make informed decisions about the sustainability of their purchases (European Commission 2009).

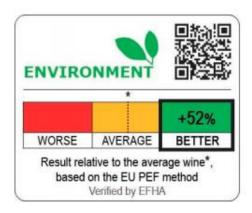Figure 11. An example of an environmental label (Elsen et al 2019)

A current Finnish example of a success story in food reporting model is the widely known and used Heart Symbol (Sydänmerkki), that is used to inform consumers that the nutritional value of that specific product is more heart health friendly – meaning lower in salt and saturated fats than other similar products available (Saarinen et al 2019;

Sydänmerkki n.d.). Some Finnish companies have also already adopted voluntary carbon footprint symbols in their food products (Raisio 2020).

Figure 12. Carbon footprint symbol used by Raisio (Raisio 2020)

The need for environmental labelling of food products has already been recognized in the EU and research is underway for developing a unified labelling system: a pilot study revealed an increase of 11,5 percent in the purchase of sustainable products when environmental footprint information was available. This pilot study also revealed a general approval and trust towards environmental labelling. (Elsen et al 2019) This would suggest that by adopting an environmental footprint labelling system, K Group could increase the sales of certain products and through this process lower the carbon footprint of its customers and own operations.

6 CONCLUSION

The purpose of this thesis was to explore the processes used by K Group to promote environmental sustainability in its supply chain, to identify the areas that are in need of improvement and to suggest business practices to address these areas. This work was conducted by dividing it into three steps. Firstly an analysis of existing literature was conducted to provide a theoretical background into the topics of sustainable business practices, supply chain theory and food retail supply chains. In the second section, the sustainability efforts of the case company K Group are presented with the use of Kesko sustainability 2020 report as a secondary data source. In the final stage these K Group initiatives and policies were analyzed critically using the existing theory and based on these findings, two tools are suggested for K Group in the form of choice editing and environmental labelling.

The research questions of this thesis were:

1. How can food retailers increase environmental sustainability in their supply chain?

2. How do the K Group stores implement environmental sustainability in their operations?

3. What tools could K Group use to increase the level of environmental sustainability in its supply chain?

The first research question regarding the environmental sustainability of food retail supply chains was answered with the use of a literature review. The research conducted revealed an increased attention to sustainability by corporations and the positive effects sustainability can have for a business. In this section, research to the sustainability actions at different sections of the supply chain was introduced. Transportation was revealed to be the largest single contributor of carbon emissions on an average supply chain. Unique characteristics of the food industry supply chain were discussed.

The second research question was answered with an analysis of K Group sustainability efforts. This analysis revealed a motivation towards improving current practices. The largest sources for emissions was revealed to come from the production of products sold. While there is some measures taken by K Group to address this, further steps are needed to lower the carbon footprint of products sold, as addressing the biggest source of emissions is the easiest way to achieve meaningful reduction. Research conducted in

this thesis also revealed that among one of the key tools that K Group aims to achieve its sustainability goals is to help customers purchase more sustainable products. Analysis revealed however a lack of substantial, practical and easy-to-use tools for achieving this goal.

To answer the third research question, two tools are suggested for Kesko. An analysis of current research has revealed that the largest individual source of emissions in food for Finnish consumers is meat and animal products. Based on this information, this thesis suggests a process of choice editing for reduction of meat sold at K Group stores. In choice editing, an individual product or product group is identified and removed from selection. To achieve this in practice, an incremental process of focused marketing efforts, choice architecture in stores and development of plant based private label products is recommended. As a second tool to help Kesko customers reduce the environmental impact of their purchases, this thesis suggests that K Group develops a climate labelling system for its products in cooperation with climate experts. In practice, this label would be placed on the packaging of each product and through the use of a rating system such as color-coding would inform the consumer of the environmental footprint of the product. These environmental labels on food products are already in use for some individual items, and larger scale adaption of this method is being developed by the EU.

Further study is required to develop application methods for the suggested tools and the development of new tools to address the remaining issues. A more extensive research on a single sustainability method and developing it further would provide for a more detailed analysis into the effects and disadvantages provided.

As a final note I would like to add that it is clear that both choice editing and environmental labelling are somewhat radical and difficult to adapt decisions, and could at least on the short term have a negative effect on Kesko's bottom line. The purpose of this thesis however is to look at effective and truly impactful ways that food retailers such as Kesko could effect Finland's overall carbon footprint: with the climate crisis, global species extinction and habitat loss moving at an alarming rate, it is the opinion of this thesis that there is simply no more time for slow, incremental shifts and baby steps.

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