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**Nudges to Promote Sustainable Food Choices in  
Icelandic Grocery Stores**

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## Útdráttur

Til þess að draga úr losun gróðurhúsalofttegunda frá matvælageiranum þarf matvælaneysla heimilanna að verða sjálfbærari. Hluti lausnarinnar getur verið að auka sölu á umhverfisvottuðum matvælum. Ein leið til þess að auka sölu þessara vara er að nota aðferð sem kallast „hnippingar“. Aðferðin byggir á þekkingu úr sálfræði og tengdum greinum um að skynsemi hugans er fjötrum háð. Þessi þekking er nýtt til þess að hanna umhverfi sem breytir hegðun fólks á fyrirsjáanlegan hátt.

Markmið þessarar ritgerðar er tvíþætt. Annars vegar að útbúa yfirlit um umhverfisstefnur og hnippingar sem snúa að sjálfbærari matarinnkaupum í helstu matvörubúðum landsins, Bónus, Krónunni og Nettó. Ritgerðin inniheldur einnig tillögur að því hvernig búðirnar geta notað hnippingar í auknum mæli til þess að auka sölu á umhverfisvænum matvörum. Síðari hluti ritgerðarinnar skoðar áhrif þess að færa umhverfisvottaðar vörur frá sérdeild innan búðarinnar í hillur með svipuðum vörum sem eru ekki umhverfisvottaðar, í íslenskri matvörubúð.

Yfirlitið sýndi að mikill munur var á magni og fjölbreytileika hnippinga á milli verslunarkeðjanna. Þær geta allar aukið til muna magn hnippinga til þess að hvetja til sölu umhverfisvænna matvara. Verslunarkeðjurnar geta nýtt sér hnippingartillögur þessarar ritgerðar sem byggja allar á fyrri rannsóknum.

Áhrif breytinganna í matvörubúðinni, höfðu á heildina litið neikvæð áhrif á sölu umhverfisvottaðra vara.

## **Abstract**

To reduce greenhouse gas emissions from the food sector, household food consumptions need to become more sustainable. A part of the solution can be to increase the share of environmentally certified products on the market. One way to encourage people to purchase more environmentally certified products is to use “nudging” as an intervention method. The nudging method utilises theories from psychology and related disciplines on the bounded rationality of humans in decision making. This knowledge is used to design environments that alter people’s behaviour in a predictable way.

The aim of this thesis is twofold. Firstly, to overview green nudges and environmental initiatives currently in place in three Icelandic grocery stores: Krónan, Bónus and Nettó. The thesis also includes suggestions on how the grocery chains can use nudges to a bigger degree. The second part of the thesis analyses the impact of incorporating eco-labelled products into ‘normal’ shelves in an Icelandic grocery store.

The overview showed that the amount and variety of nudges to promote sustainable consumption varies greatly between the grocery chains. All three chains can increase the number of green nudges in their stores substantially. The chains are especially encouraged to utilize the online store environment to promote sustainable food choices.

The results from the change of moving eco-labelled products from a separate section to normal shelves in the store had a negative impact on sales of these products overall.

## Preface

This thesis is equivalent to a 30 ECTS towards a MSc degree in Environment and Natural Resources from the faculty of Psychology at the University of Iceland. The thesis was conducted under the supervision of Ragna Benedikta Garðarsdóttir, Senior Lectures at the School of Health Science. My mentor during the writing phase of this thesis was Hulda Þórisdóttir, Senior Lecture at the School of Social Science. I would like to thank Hulda for valuable feedback, and suggestions along the way. I would also like to thank the grocery chain Nettó for providing me with access to sales data to analyse for this thesis. Most of all I would like to thank my boyfriend, Sindri Ingólfsson, who was promoted to a husband midst in the process of writing this thesis. Without his invaluable encouragement this thesis would not exist.

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# 1 Introduction

Climate change is considered the most pressing issue of the 21<sup>st</sup> century (Stern, 2006). Human-induced climate change is already affecting weather and climate extremes in every region on Earth, threatening lives, disrupting national economies, and spurring infectious diseases (United Nations, 2021). Despite the 2015 objective of the Paris Agreement to limit global temperature rise to 1.5 degrees Celsius, 2020 was the warmest year on record. Additionally, in 2019, the concentration of CO<sub>2</sub> in the atmosphere was higher than it has ever been in the last 2 million years (IPCC, 2021). A report published by The Intergovernmental Panel on Climate Change (IPCC) in 2021 paints a grim climate change picture, the report itself, is said to be a “code red for humanity” (United Nations, 2021). According to the report, the 1.5-degree threshold, which is already catastrophic to the environment, is dangerously close to slipping out of our reach. Without rapid and robust greenhouse gas reduction, global warming of 2 degrees Celsius will be exceeded (United Nations, 2021).

An IPCC report from 2018 concluded that to have a reasonable chance to meet the 1.5°C target, total global emissions need to reach zero around 2050. This will require all sectors to reduce greenhouse gas emissions by at least 85% (Rockström et al., 2017). According to IPCC, the food sector is responsible for 26% of the total global greenhouse gas emissions (IPCC, 2021; Poore and Nemecek, 2018). These emissions come from production, storage, transport, packaging, processing, consumption, loss, and waste (Mbow et al., 2019). Out of the 26%, 9% can be contributed to cattle alone, despite providing only 1% of global calories (Garnett et al., 2016). The emissions attributed to beef are also 2-10 times greater than other meat alternatives such as chicken or pork.

Furthermore, the emissions from plant-based substitutes such as beans and lentils can be up to 100 times less than the emission from beef (Clark and Tilman, 2017). The emissions from dairy products such as cow milk and cheese are also significantly higher than soy and oat alternatives. To feed a growing population while still producing less greenhouse gasses, we need a more efficient and sustainable way of producing, transporting and consuming food.

The environmental impact of individuals is primarily decided by the technology they use, therefore, it is evident that technological changes are a critical step toward greenhouse gas reduction and eventually carbon neutrality within the food sector (Midden, Kaiser and McCalley, 2007). However, changes in public behaviour are necessary to supplement the available technical solutions, after all, most of the environmental problems we face are caused by human behaviour (BIT, 2020). Behaviour and technology are intertwined, also when it

comes to sustainable food consumption patterns. To implement technical innovations such as lab-grown meat, into society, the public must accept it, buy it, and then eat it (Steg and Vlek, 2009). To support the individuals toward more sustainable behaviour, it is crucial for governments, organisations, and public and private institutions to understand what kind of interventions work to change people's behaviour (Wynes et al., 2018).

A reduction in greenhouse gas emissions from the food sector is in line with several of the sustainable development goals of the United Nations. The most apparent connection is to goal number 12, to ensure sustainable consumption and production patterns (United Nations, n.d.). Sustainable consumption has been defined as “The use of goods and services that respond to basic needs and bring better quality to life while minimising the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardise the needs of future generations” (OECD, 2002). Food is undeniable an important factor in our consumption patterns. To stay true to the UN's goal number 12, household food consumption needs to become more sustainable. To get us closer to that goal, it is essential to increase the share of meat alternatives and green products on the market. As they are referred to in this thesis, Green Product is defined as a “product striving to protect or to enhance the natural environment by conserving energy and/or resources and reducing or eliminating the use of toxic agents, pollution and waste” (Ritter et al., 2015, p. 507). In 2018, it was estimated that the market share of green products is around 4% worldwide (Bernardes et al., 2018). To promote more sustainable food consumption, researchers have called for the need for behavioural interventions to stimulate consumers toward more sustainable purchases

One way to direct our food choices to a more sustainable track is to use knowledge from behavioural science and psychology about how people make decisions in everyday life. ‘Nudging’, a concept that has arrived from behavioural science, uses the understanding of human bounded rationality in decision making. (Thaler and Sunstein, 2008). In a nudging intervention, the underlying choice architecture is changed in order to increase or decrease the likelihood of a specific behavioural response. (Thaler and Sunstein, 2008)

The aim of this thesis is threefold. Firstly, to introduce the nudging concept and explain the theories and methods from psychology and the behavioural science that the concept is based upon. Secondly, to make an overview of environmental initiatives and nudges to promote sustainable food choices that are in place in the three leading grocery chains in Iceland, Bónus, Krónan and Nettó. The objective of the overview is to understand where the grocery chains stand in these matters and to see which nudges are already used. The thesis will also include

suggestions, based on previous research, on how the grocery chains can use nudges to a bigger degree to promote sustainable food choices.

Thirdly, the aim of this thesis is also to analyse the impact of a visual nudge in an Icelandic grocery store. A product sales data from the Icelandic grocery store Nettó will be analysed to understand how the incorporation of environmentally certified products into the 'normal shelves' will impact sales of these products.

## **2 Barriers to behaviour change**

### **2.1 Pro-environmental behaviour**

How do we get people to engage in a more pro-environmental manner and what are the barriers to such behaviour? By definition, “Pro-environmental behaviour” has a minimal negative environmental impact on the natural and built environment (Kollmuss and Agyeman, 2002). Additionally, it can be a behaviour that benefits the environment (Steg and Vlek, 2009). Importantly, pro-environmental behaviour is a sustainable behaviour. The oldest and most widely used models of pro-environmental behaviour assume that environmental knowledge leads to environmental concern and attitude, which in turn leads to pro-environmental behaviour (Abrahamse and Matthies, 2018; Kollmuss and Agyeman, 2002). Therefore, these models assume that by educating the public about environmental issues, people develop environmental attitudes that result in pro-environmental behaviour. This has prompted policymakers and other stakeholders to focus on informational campaigns with the hope to increase environmental knowledge and changing behaviours (Abrahamse and Matthies, 2018; Kennedy et al., 2009). The informational campaigns in the last decade have indeed increased the knowledge of the public about climate change and other environmental issues. Studies worldwide all point in the same direction, a considerable increase in environmental values and beliefs among the public (Abrahamse and Matthies, 2018; Kennedy et al., 2009).

### **2.2 Attitude-behaviour gap**

Even though environmental attitudes and beliefs have increased significantly during the last decades, pro-environmental behaviour has not followed the same trend (Kennedy et al., 2009). Results from an Icelandic Environmental opinion survey give us a good picture of the attitude-behaviour gap among Icelanders. In 2021, 99,4% of Icelanders said they believed climate change is real. Of those, 64,9% considered climate change to be caused by humans alone. Lastly, 56,8% of Icelanders are concerned about the consequences of climate change for them personally (Gallup, 2021). According to the most used models for pro-environmental behaviour, one would assume that the pro-environmental behaviour of Icelanders would increase due to environmental beliefs and concerns. Unfortunately, this is not the case. In reality, Icelanders have one of the biggest ecological footprints on earth, with the average Icelander using 12,7 global hectares while the worldwide average is 2,7 global hectares (Landvernd, 2021). If all people on Earth lived like Icelanders, we would need approximately six times the resources available on Earth to sustain ourselves (Landvernd, 2021). The attitude-behaviour gap among Icelanders highlights that information alone appears to be ineffective to

change behaviour (Campbell- Arvai et al., 2014; Gardner and Stern, 2002; Kennedy et al., 2009). The attitude-behaviour gap is not only prominent among Icelanders. An extensive survey of 6000 consumers from Brazil, China, India, Germany, the UK, and the US, showed that 66% of the participants want to consume less and live more sustainably, yet most fail to do so (BIT, 2020).

### **2.3 System one and system two thinking**

This bounded reality of the human mind can also be understood from a dual-process theory developed by Dave Kahneman. The theory explains two different modes of thinking: intuition and reasoning mode. Those two modes are most often referred to as system 1 (intuition) and system two (reasoning). (Kahneman, 2003). System one can be described as automatic, fast, unconscious, effortless, and often guided by our emotions and external factors. To make information processing faster, the system relies on mental shortcuts such as heuristics which were described above. System one also takes care of familiar tasks and creates autopilot routines; more importantly, it establishes habits (Kahneman, 2011). System two, on the other hand, can be described as slow, conscious, and effortful (Kahneman, 2011). System two is in control when a new skill is learned, for example, when learning to ride a bike. However, when the skill is learned, system one takes over and riding a bike becomes effortless. Whilst system one is fast and effortless; it frequently makes mistakes. System two, on the other hand, makes fewer mistakes. However, fewer mistakes come with the cost of more mental effort. This suggests a trade-off between the two systems, the trade-off between accuracy in decision-making and mental effort (Thaler and Sunstein, 2008).

Many might think that as humans, system two should be the foundation of our thinking, but that is far from the truth, with system one making 98% of all our thinking (Kahneman, 2011). This means that most decisions are made intuitively with system one.

When it comes to eating decisions, people make on average 200-300 decisions every day (Wansink and Sobal, 2007). Therefore, it might not be surprising that individuals mainly rely on habits, heuristics, and other mental shortcuts provided by system one to guide food and consumption decisions (Thaler and Sunstein, 2008). To be constantly aware of the nutrition and sustainability information of the food we buy, consumers would need to rely on system two, which would require cognitive effort. Regular people with busy schedules would not handle the cognitive load to make informed and rational choices about every food product they buy (Jackson, 2005).

## 2.4 Bounded rationality

Most of the widely used models that promote pro-environmental behaviour are based on the idea of rational home economics (Mont, Lehner and Heiskanen, 2014). The idea is that people make informed and conscious decisions by calculating all costs and benefits of all relevant actions, thereby maximising their net benefits (Jackson, 2005). It has become clear that humans are not as rational as once thought (Tversky and Kahneman, 1974; Gifford, 2011). In reality, the ability of humans to make rational decisions is limited by cognitive boundaries, habits and heuristics (Thaler and Sunstein, 2008; Kahneman, 2003).

Heuristics are mental rules of thumb that we use subconsciously when making decisions (Kahneman, 2011). These “mental rules” can be described as shortcuts that make information processing fast. This is done by screening out less important information, limiting what needs to be processed (Sörqvist and Langeborg, 2019). Therefore, heuristics are useful for reducing cognitive effort and making everyday decision processes simpler. (Kahneman,2011). Regardless of the importance of heuristics in today’s society, this mental shortcut does not come without its flaws. Faster cognitive processing comes at the price of accuracy, leading to systemic biases (Gigerenzer and Gaissmaier, 2011).

A bias occurs when part of the information is ignored. It is a systematic error that deviates from the norm or rationality in a judgement (Gigerenzer and Gaissmaier, 2011; Haselton and Nettle, 2015). Many unsustainable behaviours we are trying to change result from heuristics and biases, such as optimism and system justification biases (Gifford, 2011; Sörqvist and Langeborg, 2019). The ‘optimism bias’ leads people to underestimate the odds of something terrible happening to themselves, such as the likelihood of getting a heart attack, getting into a car crash if driving too fast, or exposure to environmental hazards (Gifford, 2011; Gifford, Scannell et al., 2009).

*System justification* is a believe system that appears most often when people are satisfied with their position in society and is the need to believe and perceive the social system as fair and just (Feygina et al., 2010; Gifford, 2011). However, when a change in a regime is perceived as inevitable, many people start to justify and embrace the new system immediately. System justification is a problem in mitigating climate change since many of the environmental issues we face are rooted in today’s socioeconomic practices and institutions (Feygina et al., 2010).

A bias not so far from the system justification believe is the ‘status quo bias. This bias describes people’s tendency to continue with the current situation as it already is, which results in resistance to change. The status quo bias is highly influential in decision-making. Because



of it, people tend to prefer the more familiar choice over the less familiar one even though it may be superior (Kahneman, Knetsch and Thaler, 1991). When individuals need to choose, and there is a default option, that option is often treated as the “status quo”, or the reference point, which leads people to prefer the default option over other alternatives (Kahneman et al., 1991). An example of the status quo bias in decision-making is electing the incumbent president instead of other candidates. With more candidates to choose from the greater becomes the advantage of the incumbent president.

The status quo bias can make it difficult for policymakers to have support for intervention to change people’s behaviour. A change is by nature a break from what people are used to which interrupts the status quo (Hall et al., 2018; Boer, Witt and Aiking, 2016; Kahneman et al., 1991). However, the status quo bias can be circumnavigated. Results from a study made in the US and the Netherlands found that the acceptance of an intervention with the objective to reduce meat consumption increased with information about the climate mitigation effectiveness of the action (Boer et al., 2016). The perceived significance of policy interventions has also increased support for other behavioural interventions, such as reducing cigarette smoking (Hall et al., 2018). These observations underline the importance of communicating the effectiveness of policy interventions (BIT, 2020).

## **2.5 Habits, a barrier to a behaviour change**

One of the reasons that policy interventions have had limited success in increasing pro-environmental behaviour among the public is that they have failed to acknowledge that habits guide most unsustainable behaviours (Linder et al., 2021; Kollmuss and Agyeman, 2010; Steg and Vlek, 2009). More importantly, studies have also shown that habits are an essential part of many pro-environmental behaviours such as waste disposal, travel modes and consumption patterns (Verplanken and Roy, 2015).

Habits can be defined by three different characteristics: repetition, automaticity, and context-dependency (Verplanken, 2006). Automaticity and context-dependency make habits especially problematic. When a habit is established, the behaviour is not driven by intentions or goals, and the habit tends to persist whether we want it to or not, making habits very difficult to break (Linder et al., 2021). Habits and intentions are often in competition as strong habits hinder intentions from activating (Verplanken and Roy, 2015). On the other hand, strong intentions are needed to break a habit. Hunger, distraction, tiredness, stress, and time pressure are all factors that hinder people from acting deliberately and consciously. Therefore, these seemingly unrelated factors play a key role in reinforcing automatic habits (Verplanken, 2018).

Habits can also be established from behaviours that we had no intention of doing. For instance, limited access to public transport may lead to the habit of driving a private car to work. A poor economic situation may lead a person to buy cheaper but less nutritious or unsustainable food, a habit that may persist even when their financial situation improves (Linder et al., 2021).

The literature on habits seems to hold in practice when it comes to the grocery purchasing habits of Icelandic consumers. In an Icelandic environmental survey from 2021, participants were asked to order various factors which made it difficult for them to purchase more climate-friendly groceries (Gallup, 2021). The survey showed that Icelandic consumers consider habits the main barrier for buying more environmentally friendly food.

### 3 The theory of nudging

Interventions to increase pro-environmental behaviour should take advantage of the knowledge that humans employ system one and its mental shortcuts. These shortcuts, such as heuristics and habits, manage the many thousands of decisions we need to make daily. “Nudging” is an intervention method that utilises system one thinking to change people’s behaviour (Linder et al., 2021).

The nudge concept became popular with the bestseller book “Nudge”, written by the behavioural economists Richard Thaler and Cass Sunstein in 2008. The nudge idea applies theories and methods from psychology and behavioural science to influence behaviour. According to the authors, nudge is defined as “any aspect of the choice architecture that alters people’s behaviour in a predictable way without forbidding any options or significantly changing the economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid” (Thaler and Sunstein, 2008, p.6).

Choice architecture, as presented in the definition of a “nudge”, is the idea that we can present a choice in many ways, and what is chosen often depends on how the choice is displayed (Thaler and Sunstein, 2008). A classic example of choice architecture is that of a cafeteria. The food that people are most likely to choose is dependent on the order the food is presented in. Food presented at the beginning of the line is more likely to be selected than food presented at the end of the line (Thaler, Sunstein and Balz, 2012). Therefore, the way choices are displayed has a significant impact on behaviour, and most often, these effects are underestimated (Johnson et al., 2012).

An important part of the definition of a nudge is that it must be “easy and cheap to avoid” (Thaler and Sunstein, 2008, p.6). This part of the definition refers to the concept of *libertarian paternalism*. The *libertarian* aspect embraces freedom of choice and the idea that people should be able to do what they like. By this definition, banning sugary drinks or cigarettes does not count as a nudge (Thaler and Sunstein, 2006). On the other hand, Paternalism is defined as an “infringement on our free choice for our own benefit”. Contrary to the libertarian aspect, paternalism involves limiting or forcing choices in the desired direction to improve lives and society (Thaler and Sunstein, 2008). Seatbelt mandates, age restrictions on buying alcohol and sugar taxes are all examples of paternalism.

Libertarian paternalism can be understood as the compromiser between the two. With libertarian paternalism, the freedom of choice is respected but at the same time, it is justified to guide people in a direction that benefits the individual and society. As has been mentioned

people are not perfectly rational as we are influenced by many kinds of biases (Kahneman, 2011). The cognitive boundaries of the human mind often stand in the way of making optimal choices. Libertarian paternalism can be used to improve the choices made by people without forcing them (Thaler and Sunstein, 2003). Consumer surveys have shown that people aspire to choose better food for the environment and themselves but often fail to do so due to reasons such as habits, lack of self-control and biases (Gallup, 2021; Gane, 2021). To help people make the choices they want, a nudge to encourage people to choose better food can be embraced to increase the welfare of individuals and our planet.

### **3.1 Nudging types**

There are many different types of nudging methods when designing an intervention and various ways to categorise nudges. In this thesis, the categorisation will be according to a systematic review of nudges by Cadario and Chandon (2020). The nudges are categorised based on how they influence the individual, that is, the individual's cognition, behaviour, or affect (Cadario and Chandon, 2020).

#### **3.1.1 Cognitive nudges**

Cognitive nudges aim to change people's behaviour with information. When it comes to nudging food choices, there are three different types of nudges. These nudges are descriptive nutritional labelling, evaluative nutritional labelling, and visibility enhancement (Cadario and Chandon, 2019).

An example of *Descriptive labelling* is a visible calorie count, nutritional information, sustainability label or organic label on the food packaging in supermarkets or on menus at restaurants (Cadario and Chandon, 2019). In recent years people's interest in the life cycle of food products such as the origin of the product, production process and packaging has increased substantially (Vandenbroele et al., 2020). This has led to a considerable increase in sustainable and environmental labelling (Hornibrook et al., 2015). Sustainable labels on food products can grab people's attention in a grocery store where many different products compete for their attention. With limited cognitive capacity, people can use mental shortcuts such as the heuristic that "eco-labelled products are better than non-eco-labelled products". Studies have shown a positive relationship between descriptive labels such as sustainability- and organic information with a willingness to pay more for a product (Hartmann et al., 2018; Vandenbroele et al., 2020). Studies have also shown a positive relationship between taste and eco-labelled products. On average, people prefer the taste of an eco-labelled product compared to a non-eco-labelled

product (Sörqvist et al., 2013; Sörqvist, Haga and Langeborg, 2015). Descriptive labels can also provoke emotional responses such as pride for eating healthy or reducing carbon footprint; however, this has only been observed when consumers trust the food labels (Vandenbroele et al., 2020). Many different labels on the market make it complicated for people to trust the labels they buy. When it comes to increasing sustainable food choices, more research on eco-labels is necessary to understand which labels people recognise and trust (Penz, Hoffmann and Hartl, 2017).

*Evaluative labelling* is simpler than descriptive labelling, and it aims to make it even easier for the consumer to understand how sustainable, eco-friendly, or healthy a product is. This is done for example with colour coding, star rating or smiley faces. An example of an evaluative labelling nudge would be colour-coded nutritional information on food products, making it easier for consumers to identify healthier food. Healthier food is then marked as green, while less healthy food is marked as red (Cadario and Chandon, 2019). This nudging strategy has also been applied to help consumers make better decisions regarding the sustainability of products. Thirty-seven products in a grocery store in New South Wales, Australia, were colour coded according to their carbon footprint. Green indicated a low carbon footprint, yellow was the average carbon footprint, and black colour indicated a high carbon footprint (Vanclay et al., 2010). This study showed a decrease in the sale of products that were labelled black and an increase in green labelled products. Price was, however, an important factor. If the green-labelled products were the cheapest among competing products, their sales increased considerably. This increase was not as substantial for comparatively expensive green labelled products (Vanclay et al., 2010).

*Visibility enhancement nudges* do not provide information directly. These nudges are however categorised as a cognitive nudge since they inform the individual of the availability of a product. Visibility enhancement nudge makes the desirable option more visible and the undesirable option less visible. For example, healthy food can be placed on the shelf close to the cash registers in grocery stores instead of unhealthy food (Cadario and Chandon, 2019). It has also been shown that products presented at eye level are more likely to grab people's attention and be bought than products above or below eye level. There is no coincidence that the Heinz tomato ketchup has its unique place at eye level in almost all grocery stores (Leeson et al., 2015). Heinz ketchup pays money to grocery stores to be arranged at eye level on shelves. Their product becomes more visible to the consumers by being placed at eye level which increases their sales enough to justify paying for the premium placement.

Availability of products is also part of visibility enhancement nudges. Studies have shown that increasing the share of healthy products in a grocery store can increase the sale of these products (Pechey et al., 2018). Increasing the percentage of sustainable products in stores could also lead to the same effect. Lastly, incorporating sustainable, organic, or vegetarian products within the existing assortment is also part of visibility enhancement. By selling the sustainable products on a separate shelf, the products are then skipped by people who do not intend to buy them. By incorporating them with other products, customers recognise these products, possibly making them more likely to accept them and buy them (Vandenbroele et al., 2020).

However, it is necessary to keep in mind that previous research has shown mixed results in incorporating sustainable products on the mainstream shelves in grocery stores (Van Herpen et al., 2018; Van Herpen et al., 2015). Van Herpen and colleagues conducted an experiment in an online grocery store environment to test the effect of incorporating sustainable meat products with conventional products. The sustainable products had a star on them, indicating improved animal welfare conditions compared to conventional products, which had no star. The results showed that the optimal display of these products is dependent on price. Sustainable meat products offered at a low price gained choice share from conventional products when the mixed display was used. However, sustainable products at an intermediate price reduced in choice share when offered in a mixed display compared to when offered in a separate section. Sustainable products at a high price were not affected by the assortment, that is, the choice share was relatively low overall. To further complicate matters, studies also suggest that when a customer has the intention to buy sustainable products the location of the products is also important. In that case the consumer is more likely to buy greater quantities of sustainably certified products if they are positioned on a separate shelf (Van Herpen et al., 2018).

### **3.1.2 Behavioural nudges**

Behavioural nudges aim to influence people's behaviour without needing to influence what they feel or know. Most often, people are not even aware of the existence of this kind of a nudge (Cadario and Chandon, 2019)

*Defaults* are the most used behavioural nudge. A default option is an option that will be chosen if the chooser decides to do nothing. Due to heuristics such as the status quo bias and path of least resistance and the fact that the default option requires the least effort, many people will always go for the default option (Thaler and Sunstein, 2008). As a result of the power of the default option over people, it is essential to choose cautiously which option is the default

option (Thaler, Sunstein and Balz, 2014). An excellent example of the importance of the default is the difference in consent rates for organ donation in Germany and Austria. In Germany, where the default is not to be an organ donor, the consent rate is only 12%. Whereas in Austria, where organ donor is a default, the consent rate is 99% (Thaler and Sunstein, 2008). The default option has also been used to promote pro-environmental behaviour. A study by Momsen and Stoerk (2014) showed that by changing the default in an energy plan to renewable energy, there was a 20% increase in that option. Finally, default options can also be used to guide food choices. On average, we make 200 choices a day concerning food thus it might not be surprising that food is easily nudged (Wansink and Sobal, 2007). By making the healthier option the default option people become more likely to choose that option. The default option can also be very influential in an online grocery store environment. By making the healthier and more sustainable food products the default people are more likely to buy these products (Mont et al., 2014)

*Size enhancement* is yet another nudging strategy that belongs to behavioural nudges. Size enhancement is about changing the size of the packaging, plates, bowls, or prepared portions. The effect of size enhancement nudge becomes even more significant when people are unaware of the changes (Cadario and Chandon, 2020). Studies from the last decades have established a positive relationship between portion size and food intake which has been associated with increasing obesity (Wansink, Wansink and Sobel, 2007; Wansink, 2005). An example of a size enhancement nudge would be if grocery stores would sell smaller portions of unhealthy food (Cadario and Chandon, 2018). Studies have also shown that reducing the plate size in an “all you can eat” buffet reduces food intake and food waste (Wansink and Ittersum, 2013). Size enhancement intervention can also be used to nudge more sustainable food choices such as by reducing the packaging size of high carbon footprint food.

Convenience enhancement nudges are all about making the behaviour that is being nudged more convenient, easy to access and effortless. An example would be to place the vegetarian option first in line in a cafeteria and the meat option later in the line.

### **3.1.3 Affective nudges**

Because humans are social creatures, *social norms* can be an effective way to nudge human behaviour in the desired direction (Thaler and Sunstein, 2008; Allcott, 2011; Demarque et al., 2015). Social norms are the perceived rules and standards of acceptable behaviour in a community (Mont et al., 2014). These norms can influence individuals in two different ways, as descriptive- or injunctive norms (Mont et al., 2014). *Descriptive norms* are how we perceive

that other do things and how they behave, whereas *injunctive norms* refer to an individual's moral compass: what ought to be done and what ought not to be done (Demarque et al., 2015). For a social norm to influence behaviour, it needs to be salient to the individual (Cialdini and Goldstein, 2004). People often have several social norms for the same situation, and the most salient norm is the one that influences the behaviour of the individual the most. Therefore, by reminding individuals about a particular social norm in a specific situation, they become likelier to use that norm to guide their behaviour (Cialdini et al., 1990). Studies have shown that social norms can effectively encourage pro-environmental behaviour such as sustainable transportation modes, recycling, energy conservation and sustainable food consumption (Allcott, 2011; Goldstein et al., 2008; Demarque et al., 2015).

Using social norms as a nudging method must be dealt with carefully; if not, it can lead to undesired effects. Schultz and colleagues (2007) study on the impact of social norm feedback on household electricity consumption is the perfect example of how social norms can backfire. In their study, social norms were used to encourage a reduction in household electricity consumption. When households were only provided with descriptive normative information about average energy usage in the neighbourhood, households showed normalisation behaviour (Schultz et al., 2007). Households that consumed more energy than the average reduced consumption and moved closer to the norm. However, households that consumed less energy than the average increased their consumption, moving closer to the norm as well (Schultz et al., 2007). The boomerang effect disappeared when the experimenters added an injunctive norm message that implied social approval or disapproval (depending on the household's energy usage) (Schultz et al., 2007). These findings emphasise how carefully social norms must be conveyed when designing pro-environmental behaviour interventions.

Even though there is joint agreement and an injunctive norm that we should protect the environment and reduce our carbon footprint, the percentage of people that engage in pro-environmental behaviour is relatively low (Evans et al., 2017; Demarque et al., 2015). For example, even though the negative climate impact of driving frequently is well known, a travel survey conducted in 2021 in Iceland showed that 78,7% of people living in the capital area drive to work. (Maskína, 2021).

When promoting pro-environmental behaviour, descriptive norms could potentially focus on the fact that most people do not respect the norm, which gives other people the “right” to disrespect the norm. This can be avoided by focusing on injunctive norms or reframing descriptive norms about minority pro-environmental behaviour, such as sustainable food choices, to encourage others to engage in that behaviour (Evans et al., 2017). Research has also



shown that by focusing on that the norm is changing (a dynamic norm) instead of the current state of the norm can encourage behaviour that does not follow the norm (Sparkman and Walton, 2017). This is what Demarque and colleagues did to promote sustainable food choices in a grocery store in 2015. In the study, posters with sentences such as “more and more people are buying eco-labelled products” were used. Even though green food purchase was a minority behaviour, they framed true descriptive norms in a way that successfully led to an increase in green food purchases (Demarque et al., 2015).

*Priming nudges* are stimuli in the environment with the aim to influence people’s subconsciousness before any choice is presented. The objective is that the primed stimulus is held unconsciously in associative memory and triggers behaviour response due to bounded rationality, more specifically, the availability heuristic (Wee, Choong and Low, 2021; Momsen and Stoerk, 2014). The primed stimulus can be visual, verbal, olfactory, or taste (Evans et al., 2017). An example of visual stimuli in a grocery store would be painted footprints on the floor leading people to environmentally certified food products. Another example of priming effects is a study by Tate and colleagues (2014), which showed that people primed with a poster that included a pro-environmental message were more likely to buy package-free food products.

### **3.2 The Behavioural Insight Team**

The utilisation of the knowledge from behavioural science and psychology took a long time to find its way out of the laboratory. Finally, after the publication of the article “libertarian paternalism” in 2003 and the book “Nudge” in 2008, both written by the authors’ Thaler and Sunstein, governments around the world began to take an interest in incorporating behavioural science and psychology into policy (Halpern and Sanders, 2016). In 2010 The United Kingdom was the first country to establish a special Behavioural Insights Team (BIT), also known as the “nudge unit”. The objective of the BIT was to use insights from behavioural science, which could be applied to public policy to promote pro-social behaviour among the citizens of the United Kingdom (Evans et al., 2014). The British nudge unit has shown real-life examples of how effective the nudging theory can be. Since the team’s establishment, there have been several improved policy implementations based on the nudging idea in the UK (Mont et al., 2014). These improvements have led to a 34% increase in the acceptance rate of pupils from underrepresented schools to top universities, a 38% reduction in patient referrals to overbooked hospitals, and a 37% rise in tax declarations rates (Quinn, 2018). When it comes to promoting pro-environmental behaviour, there are also various success stories, thanks to the nudging unit. For example, 2% reduction in energy use per consumer by providing energy consumption

feedback, reducing household power usage during the warmest day of the year by sending a text message by default, and boosting food waste recycling by using prompts (BIT, 2018). The BIT in the UK has also worked with other nations and international organisations to promote pro-environmental behaviour. For example, in collaboration with the United Nations Environment Programme (UNEP), they wrote the “Little Book of Green Nudges”. The book consists of evidence-based guidance on how green nudges can be implemented on university campuses (Park, 2020).

In January 2020, the BIT published the report “A menu for change, using behavioural science to promote sustainable diets worldwide”. The report highlights that an unsustainable diet is a global challenge that needs to be faced (BIT, 2020). The report describes nudging intervention as an important starting point to get our food choices on a sustainable track. However, it is made clear that soft policies such as nudges will not be enough to tackle this global challenge and should not stand in the way of more robust policies such as taxes and bans (BIT, 2020). The report mentions how different stakeholders can ease the shift towards more sustainable diets with nudging. For example:

*Governments* should promote and subsidise low carbon food and put a carbon tax on high-impact food. It is also suggested that governments should develop environmental performance ratings for grocery stores to nudge consumers towards sustainable retailers. Governments should also reduce and remove unsustainable foods from public institutions such as hospitals, schools and government offices and use these places to nudge sustainable food choices (BIT, 2020).

*The industry* is encouraged to make plant-based food available in grocery stores, menus, and canteens. The environmentally friendlier options should be the default options in online supermarkets, events, or flights. Grocery stores are advised to incorporate plant-based options among the meat options instead of separating them. Lastly, BIT suggests prompting sustainable products during checkout in online grocery stores.

*Consumers* should be targeted with positivity and pride instead of guilt and idealism. Campaigns should be targeted at special moments in people’s lives when habits are disrupted, such as when starting a university, moving into a new house, or buying a new kitchen. Lastly, use social norms to encourage low carbon diets with a message such as “more and more people are reducing their meat consumption” (BIT, 2020).

### 3.3 Nudging around the world

The success stories of the BIT in the United Kingdom caught the attention of countries worldwide (Evens et al., 2017; Halpern and Sanders, 2016). Already in 2013, several governments and non-governmental organisations had started to become interested in adopting the insight from behavioural science into public policy. Taking inspiration from the British nudging unit, the former president of the United States, Barack Obama, established the ‘US nudge unit’ in 2013 (Halpern and Sanders, 2016). Obama pointed out that by establishing a nudging unit, the government utilised the knowledge gained from behavioural science in policymaking. The government would also be stepping into the 21<sup>st</sup> century in many ways, such as by helping people to find better jobs, easing and accelerating the cleaner energy transition, as well as helping the citizens of the US to live healthier and better lives (Evens et al., 2017). Australia and Singapore can also be considered early adaptors of the nudging method in policy. Both countries established a nudging unit within the central government in 2013, with the book ‘Nudge’ and the UK’s BIT as an example (Halpern and Sanders, 2016). Today, certain countries have taken the lead in adopting the nudging theory in public policies. These countries are the UK, the USA, Australia, Singapore, Denmark, the Netherlands, and France (Whitehead et al., 2015).

International organisations such as the OECD and the United Nations have also applied knowledge from behavioural science to their work. Since 2013, the OECD has been at the forefront in the use and adoption of *behavioural insights* (BI) in governments, public organisations, and regulatory bodies in the OECD countries. OECD has also put effort into gathering policy makers and practitioners to identify opportunities and challenges for the BI community. In 2017 the organisation published a report consisting of 100 BI case studies from across the world with key lessons for public institutions (OECD, 2017). Furthermore, OECD utilises insights from behavioural science to promote environmentally sustainable behaviour. OECD has published reports designed for policy makers to inform them on how to improve the effectiveness of existing environmental policies and establish new ones based on ideas from BI (OECD, 2017)

In 2016, the first Behavioural Science Advisor was appointed to the United Nations. The role of the advisor was to bring behavioural insights into policies and programs within the UN. Ban Ki-moon, former Secretary-General of the United Nations, stated that to fulfil the Sustainable Development Goals, behavioural insights research must be accounted for (Shanker and Foster, 2016). In 2017, the United Nations Environmental Program published a report that

identified critical behavioural barriers to sustainable consumption and examples of how behavioural science can be brought into policy to achieve more sustainable consumption (UNEP, 2017)

Nudging in public policy is likely more prevalent than many think. According to a report by Professor Whitehead and colleagues, it is estimated that 51 countries have policies that have been influenced by behavioural science. The popularity can also be explained by the fact that a nudging intervention should be “cheap and easy to avoid” (Thaler and Sunstein, 2008). Governments can address various social problems at a minimum cost without limiting people’s freedom.

## **4 Overview of green nudges in Icelandic grocery stores**

### **4.1 Grocery store's impact**

Grocery stores undeniably have a significant political and economic power in the global food system (BIT, 2020; IPCC, 2018; Pulker et al., 2018). To emphasise the economic power of grocery stores, a study from 2015 showed that the supermarket chain Walmart has the tenth largest economy globally. To put that into context, the supermarket chain has a larger economy than the whole of Australia (Pulker et al., 2018). With grocery stores having such unprecedented power, the relationship between corporations and society is important. Grocery stores can nudge the public towards desired and undesired behaviour using their influence.

In developed countries, around 30% of household greenhouse gas emissions come from the grocery purchases (Panzone et al., 2021). With grocery chains being the place where people make most of their food decisions, grocery stores are key actors in reducing greenhouse gas emissions from the food sector. By influencing the daily purchasing behaviour of the public, grocery stores can stimulate consumers towards more sustainable food choices and thereby reduce emissions from the food sector (Panzone et al., 2021).

The growth of 'store-branded products' in grocery stores has increased the power of grocery stores in the food sector even more (Hattersley and Dixon, 2013). The grocery store's store-branded foods are products sold privately in their stores. This gives the stores a double role, the role of a manufacturer and that of a retailer (Pulker et al., 2018). Iceland is no different regarding this increase in 'store-branded' products. The two most popular grocery chains in Iceland have increased their own-brand food in the last few years (Kronan, n.d.; Bonus, n.d.).

As a result of the impact grocery stores have on the food sector, it is vital to understand where the grocery stores stand when it comes to promoting sustainable food choices. To the best of the author's knowledge, no overview of the environmental policies and objectives in the leading Icelandic grocery stores exist, not to mention an overview of green nudges in Icelandic grocery stores.

### **4.2 The business case of sustainability**

As mentioned in the previous section of this thesis, consumers are becoming ever more aware of the sustainability issue. They have a strong desire for the grocery stores to become more transparent (Ipsos, n.d.). Surveys have shown that consumers worldwide are willing to change their food purchasing behaviours towards more sustainable choices, and the majority are already trying to do so (Haller, Lee and Cheung, 2020). As we know, stated willingness does not always lead to actions, due to habits, heuristics, cognitive load, or a busy schedule. It is here

that nudging can play a significant role. The nudging method can aid customers towards the choices they want to make.

Conventional grocery stores usually have low margins, complex supply chains and daily challenges that need to be faced (Siemssens and Lierow, 2021). This pushes grocery stores to focus on short-term matters. Sustainability and climate change are, however, long-term issues. This, unsurprisingly, makes sustainability issues challenging and complex to tackle and often overlooked by retailers such as grocery stores. Some might ask why grocery stores should invest time and money into promoting sustainability? The simple answer is that it pays off. The leading grocery stores in the world have already begun to take sustainability very seriously (Gatzer and Roos, 2021). Despite many arguing that sustainability would not be at the top of people's minds during and after the Covid-19 pandemic, the opposite has proven true. Companies with sustainability strategies were more resilient during the Covid-19 pandemic, and consumers' interest in sustainability has increased even more in the last two years (Gatzer and Roos, 2021). After all, the pandemic has made it clear that all people on planet Earth share the same fate. Research has also shown that sustainability actions go hand in hand with business success. The market share of sustainable-certified products has grown four times faster than the market average in the last year. Sustainability has undoubtedly become a source of value that grocery stores can use as a competitive advantage (Siemssen and Lierow, 2021).

The grocery stores at the forefront of incorporating environmental measures have realised the importance of involving social responsibility and corporate governance in their operation. These three terms, environment, society, and governance are collectively known as ESG (Gatzer and Roos, 2021). Each business is intertwined with the environment, society, and governance matters. Similarly, as ESG is intertwined with companies, each element within the ESG is intertwined as well (Siemssen and Lierow, 2021; Henisz, Koller and Nuttall, 2017)

The Environment in ESG consists of all resources the company needs, the waste it discharges, and the company's carbon footprint. All companies are dependent on energy and resources to thrive as well as being impacted and make an impact on the environment (Henisz, Koller and Nuttall, 2017).

The social element of ESG considers the connection the business has with its stakeholders, the main one being customers, employees, suppliers, and the local community where the business operates. It also considers the importance of the company's reputation, equality, and its relationship with the labour. For a business to operate, there needs to be a society. Every company is impacted by its society, and society is affected by its companies (Henisz, Koller and Nuttall, 2017).

Lastly, the governance element of ESG refers to the procedures, decision-making process, and different regulations in connection to the business. Every company needs to comply with the law and regulations within its society.

With ESG being an inseparable part of a business, it might not be surprising that studies have found a positive relationship between ESG and financial performance (Siemssen and Lierow, 2021; Friede, Busch and Bassen, 2015). A review by Friede et al. emphasised the nature of the relationship between the two. The systematic review included 2200 individual articles. Of the 2200 studies, 90% showed a nonnegative relationship between ESG and financial performance. More importantly, 63% of the studies reported a positive relationship between ESG and financial performance. (Friede, Busch and Bassen, 2015)

Even though most grocery stores acknowledge that sustainability will be one of the main competitive advantages in the years to come, there continues to be a gap between ambitions and reality (Siemssen and Lierow, 2021). The gap between the two has been explained by reasons such as retailers failing to incorporate sustainability into decision making on a daily basis. In a survey made across Europe, only 10% of grocery stores measure their performance in accordance with the performance of sustainability indicators. Another explanation for the gap has been that it is impossible to achieve something if you do not measure it. To make a business sustainable, grocers must evaluate the financial impact of sustainability initiatives. Doing that makes it easier to set realistic targets, which would lessen the gap between ambitions and reality (Siemssen and Lierow, 2021).

### **4.3 Green nudges and environmental efforts in grocery stores around the world**

Before introducing a comprehensive overview of environmental efforts in the leading grocery stores in Iceland a short background from other countries is in order. The subchapters below include a short overview of environmental efforts and nudging initiatives from the leading grocery stores in the USA, Sweden, and the UK.

#### **4.3.1 Walmart, USA**

Walmart is the grocery store that dominates the U.S. grocery market, with an estimated market share of around 26%.

Walmart has integrated ESG into its operation. Through ESG strategies, the business aims to operate more responsibly towards all three dimensions of ESG (Walmart, 2019). Walmart is one of the three supermarkets in the US that has publicly committed to zero waste by 2025. The supermarket has taken active steps to reduce food waste in the last few years. In

2018, Walmart introduced the machine learning app, Eden, to improve stock and shelf life, thereby reducing food waste. A freshness algorithm within the app identifies spoilages in food and optimises the flow of products. This technology has helped Walmart match supply and demand and increase efficiency in the supply chain. Employees in the store can use the app to restock products based on their freshness (Kleinman, Schneider, Strumwasser and Caro, 2018). To reduce food waste on a consumer level, Walmart decided to change date labels from “use by” to “best if used by” to prevent unnecessary household food waste. Their website states that the supermarket works with sustainable fisheries, and all seafood sold in Walmart comes from these sustainable suppliers (Walmart, 2020). The supermarket is also working with suppliers to make packaging more sustainable. One of the supermarket objectives is to make 100% of their ‘own brand’ packaging recyclable, reusable or compostable by 2025. Currently this number stands at 62% (Walmart, 2020).

When it comes to green nudges to promote more sustainable food choices in the store, almost nothing was found on their website or sustainability reports from the last years. Environmentally certified foods, plant-based food, fair-trade, seconds or food that is getting close to the expiry date seem not to be promoted.

#### **4.3.2 ICA, Sweden**

ICA is the leading grocery retailer in Sweden. The grocery chain has around 1300 stores globally, and the estimated market share in Sweden is about 36% (ICA, n.d.). ICA has put much effort into integrating ESG into its operation and has the objective to be a leader in corporate responsibility. The company has also incorporated some of the sustainable development goals of the United Nations into its operations. At the COP26 climate conference in 2021, ICA was awarded for its work to create climate-neutral business and its efforts to reduce the negative climate impact from groceries on both the supplier and consumer levels (ICA, n.d.).

ICA was the first grocery retailer to set a science-based climate target, and between 2006 and 2020, greenhouse gas emissions from ICA’s operations reduced by 76%. In 2020, ICA reached the goal of becoming climate neutral, where the remaining emissions were offset through carbon credit. ICA decided to put the bar even higher than climate neutral by halving the climate impact of customer’s food purchases by 2030 (UNFCC, n.d.). To reach that goal, active steps are already being taken by ICA in cooperation with suppliers to develop more attractive choices of low climate impact food products. ICA is working on increasing the share of Swedish produced plant-based food. They encourage innovation in the Swedish food industry and allow small innovative businesses to sell their food products in their stores. Local



suppliers can simply register themselves to a digital platform established by ICA. ICA then goes through the applications, and if the supplier is approved, ICA stores can purchase locally produced plant-based food directly from the manufacturer (Braaksma, 2017).

ICA introduced vacuum packaging for fish and meat to reduce food waste. The vacuum extends shelf life nearly twofold in comparison to traditional packaging. The company is also putting much effort into reducing plastic. All single-used items made of plastic are being phased out and, when feasible, plastic packaging is being switched out for non-packaging, recyclable, or reusable packaging.

Different measures are also in place to make it easier for customers to make more sustainable choices. ICA works actively on changing the assortment in their stores, making the climate friendlier choices more prominent. With an app called “My climate target”, customers can monitor their actual climate impact from the food purchased at ICA. The app also provides individualised tips to reduce the climate footprint from the bought food. Customers are equipped with climate-friendly recipes (ICE, 2021).

ICA created several videos accessible on social media and YouTube to promote plant-based food. In the videos, people on the street of Stockholm, Sweden, are asked about their attitudes toward plant-based food and food preferences in general. The video also features a top chef preparing vegetarian meals.

ICA’s effort to promote vegetarian food seems to have proven successful since the sale of fresh and frozen vegetarian food increased by 16% in 2019 alone (Molthe, 2019). Furthermore, a consumer survey conducted by ICA showed that the number of “Vegans” increased from 9% in 2020 to 12 % in 2021 (ICA, 2021). The same consumer survey also showed that 29% of women that purchase their food in ICA cook plant-based meals two times a week or more (ICA, 2021)

ICA sustainability work is very data driven. For example, they combine sales data and climate to identify the most efficient ways to reduce the climate impact of the food sold. Data from various sources are also used to optimise the product assortment in the store, thereby minimising food waste. The recommendations are based on expiry dates, sales transactions, warehouses, deliveries, and customer behaviour.

### **4.3.3 Tesco, United Kingdom**

Tesco is the largest grocery chain in the UK, and has around 4000 stores distributed around the country, and a market share is estimated to be about 27,6% (Statista, 2022). Tesco claims that they contribute in different ways to all the sustainable development (SD) goals of the United

Nations. To fulfil that promise, they have set a measurable indicator concerning each SD goal (Tesco, 2021).

In late 2020, Tesco became the first grocery chain in the UK to set the objective of increasing the sale of plant-based food, more specifically to increase the sale by 300% by the year 2025. In 2021 the sale of these products increased by 96%. To increase the sale, there needs to be an increase in the proportions of plant-based food on the shelves. Today, customers can choose from 350 plant-based products, which is a 167% increase compared to 2018 (Tesco, 2021).

Tesco has four packaging principles. Firstly, to remove packaging where possible, reduce packaging material when it is not. Lastly, reuse more and recycle the rest. The first principle has led to 1 billion pieces of plastic being removed from products. In 2019, 84% of Tesco's 'Own brand' packaging was recyclable (Tesco, 2021).

Tesco has put much effort into increasing the sale of healthy products. Inspired by the UK's nudge unit, various nudges are already in place to promote a healthy diet. For example, health scores on food packaging, increased visibility of more nutritious products, promotions, reduced portion size and low prices (Tesco, 2021). These nudges could all be used to promote environmentally friendly food as well.

#### **4.4 The most popular Icelandic grocery stores**

Today, discount stores are the most popular grocery stores in Iceland. The three most popular discount grocery stores are Bónus with 33,6% market share, Krónan with 29,4% market share and lastly Nettó with 11% market share (Hauksson, 2021). However, the 11% market share of Nettó does not consider the sales that go through their online grocery store. In 2017, they were the first Icelandic grocery store to open an online store. The popularity of the online store has multiplied in the last two years. Therefore, it is concluded that with the emergence of the online grocery store, Nettó's market share is undoubtedly higher than 11%. Its impact on the food system and its ability to influence the food choices of the Icelandic people is therefore notable and worthy of having its place in this overview. Krónan established an online grocery store following the public's demand during the Covid pandemic, being the second discount grocery store in Iceland to do so.

By shopping online, customers can save themselves time and the drive to and from the grocery store, which is around three times a week for the average Icelander (Sigurðsson, 2020). Almost all the stores belonging to the three grocery chains in this overview are situated on the

outskirt of towns or shopping centres but not within the neighbourhoods themselves. Consequently, people drive to the grocery store instead of walking.

Online grocery stores also provide many new opportunities to nudge sustainable behaviour. Studies have shown that digital nudges can be an effective tool to tackle unsustainable and automatic decisions, which food choices often are (Berger, Nuske and Muller, 2020). It is also important to acknowledge that consumers behave differently in an online grocery store environment compared to a physical environment. For example, when people purchase food online, they tend to plan their purchases better and buy food for the whole week at a time. The differences in behaviour in a physical environment and online environment make research on digital food nudging important. Especially since consumer behaviour is increasingly shifting to an online environment (Berger et al., 2020).

In the following sections, an overview will be presented of environmental policies and green nudges that are in place in each of the three grocery chains mentioned above. The overview is based on social responsibility reports, observations of the author in each store, and email communications with environmental managers working for the grocery stores. The categorisation of the green nudges within each store will be based on chapter 3.1 in this thesis.

#### **4.4.1 Bónus**

As mentioned above, Bónus is the most popular grocery store in Iceland, with a 33,6% market share. Today there are 31 Bónus stores distributed around the country; 19 are located within the capital area and 12 in regional Iceland (Bonus. is, 2020). Since the opening of the first Bónus store in 1989, its main objective has been to provide customers with the lowest food prices in the country. Today, price surveys usually show that Bónus offers the best food price in the country despite tough competition (Vidaskiptabladid, 2020)

Bónus claims that they have always emphasised environmental issues. The grocery chain has put six of the 17 sustainable development goals of the United Nations as a priority in their operation. Of these six goals, two are closely related to the environment: goal number 12, responsible consumption, and production: and goal number 13, climate action (Sustainable development goals, n.d.; Bónus, 2020). The chain took an essential step toward achieving its sustainability goals by incorporating sustainability into daily decision making (Siemssen and Lierow, 2021). That is done by measuring their performance in accordance with the sustainability indicators.

In 2018, Bónus was the first Icelandic grocery store to offset its carbon footprint (Bónus, 2020). The carbon offsetting is done by funding an equivalent carbon dioxide saving, which in

their case, is to plant 6670 trees on a land area next to Úlfjótuvatn. The same year, Bónus stopped selling ordinary plastic bags and began to offer their consumers to buy biodegradable bags instead. This act is in accordance with an Icelandic regulation put into effect 1st of January 2021. The regulation states that stores in Iceland may no longer offer plastic shopping bags to customers (Government of Iceland, 2021). In the last two years, Bónus has also encouraged its customers to use reusable bags instead of single-use bags.



When it comes to waste sorting, 75,6% of all waste is sorted, a percentage which has been growing in the last years. Lastly, from the opening of the first store in 1989, the grocery chain has set itself to minimise food waste. For example, seconds, food products with minor flaws, e.g., do not look as appealing as the other fruits are sold at reduced price and food that is getting close to its expiry date (Bonus, 2020).

Bónus has considerably many ‘in-store brand’ products. The corporate has changed the packaging material to a more climate-friendlier option for some of these products.

In the overview below, the author has categorised the green nudges in place in Bónus. For Bónus to reach its environmental goals and make good on its promise to prioritise the sustainable developmental goals, this thesis includes a section with suggestions on how Bónus can increase the quantity and quality of green nudges in its stores.

**Table 1**

*Categorisation of green nudges that are in place in Bónus (Bónus, 2020.)*

Nudge type	Example	Objective
Descriptive labelling	 	Bónus sells products that have sustainability labels on their packaging. The labels can function as an eye-catcher when many products are competing for people’s attention (Bónus, 2020).
Evaluative labelling		Not in place yet

---

Visibility enhancement



In the last years, the share of eco-labelled products and vegetarian options has increased. Increased share is related to greater visibility which affects food purchases. In 2020 they introduced new eco-friendlier hygiene products (Bónus, 2020).

Defaults

Not in place yet

Size enhancement



Reduced packaging material and more eco-friendlier packaging material for 'in-store brand' products. Bónus has also encouraged suppliers to reduce plastic in packaging (Bónus, 2020).

Social norms



There is one example of the use of social norms to nudge customers. In a campaign to reduce food waste Bónus used slogans such as “Breath cleaner air by working TOGETHER to reduce food waste” to promote customers to buy seconds.

Priming



Most of the green nudges in Bónus stores can be categorized as priming nudges. Priming nudges are used in social media, advertisements in newspapers, tv's, and printers in front of and within the Bónus stores. The goal with the nudges is to encourage people to remember the reusable bag or buy environmentally friendly products (Bónus, 2020).

#### 4.4.2 Krónan

Having claimed a couple of awards in the past years for its contribution to environmental issues, Krónan is without a doubt the leading grocery chain in Iceland when it comes to environmental policies and objectives (Samtök Atvinnulífsins, 2019; Krónan, n.d.). Like Bónus, Krónan has set itself to form and develop its objectives and policies in its operations around the sustainability goals of the United Nations. Three of the goals which Krónan focuses on have been implemented into the company's environmental policies. The goals are goal number 11; sustainable cities and societies; goal number 12; responsible consumption and production and goal number 13; climate action.

One of Krónan's most significant achievements in relation to environmental actions was in 2019. That year Krónan managed to be the first grocery store in Iceland to become certified with the Nordic Swan Ecolabel. In December 2020, all Krónan 's grocery stores were certified with the label (Krónan, 2020). The Nordic Swan ecolabel is well known in the Nordic countries, and according to an Icelandic survey, 88% of Icelanders are well familiar with it (Svanurinn.is, n.d.). One of the main objectives of the Nordic Swan is to minimise the environmental effects of consumption and production of products (Svanurinn.is, n.d.).

To receive the certification, the applicant needs to adopt a comprehensive approach to environmental measures and reduce environmental impact (Svanemerket.no., n.d.). For Krónan to be certified with the Swan label, it had to implement; an active energy policy that reduces energy use. To use only environmentally certified cleaning products in their operations. Of all hygiene products the grocery chain has for sale in the store, 20% need to be certified with the Swan label. Of all food and drink, 4% of products need to be labelled organic. Lastly, the corporation needs to have an active policy to reduce food waste (Krónan, 2020). Krónan decided to stop offering plastic bags altogether, even though they were biodegradable. This act came through in March 2020, since then, customers have been encouraged with different kinds of nudges to remember their reusable bags. Paper bags can, however, be bought in the stores.

According to Krónan's sustainability report, one of their biggest environmental goals is to reduce food waste among suppliers, retailers, and consumers. To reduce food waste on all these different levels, there needs to be a variety in policymaking. In an attempt to fulfil its food waste objective, Krónan has;

- Reduced the amount of packaging material in certain products in cooperation with suppliers.
- Utilised product sales data for procurement to minimise the risk of throwing away products that aren't sold in time.

- Lowered the price of products that are getting close to expiring date.
- Avoids “selling immoderate quantities of food to decrease the risk of food waste in households.
- Gives customers advice on how leftovers, old- fruits and vegetables are utilised despite their state (Krónan, 2021)

According to Krónan’s sustainability report, a lot of effort has been put into the packaging policy. Firstly, they always begin by examining if the product can be sold package free. This question often involves trade-offs since package free food products usually last shorter than packaged foods, which could lead to food waste. When a package free solution is unsuitable for a particular product, attempts are made to find environmentally friendly package solutions (Krónan, 2020). For example, customers can now buy reusable glass bottles or bring their containers to fill up their milk supply at a milk refill station located in one of their stores. In another Krónan store, they have set up a soap refill station. Customers can bring their containers or buy containers made from recycled plastic from Krónan and then fill up their shampoo and conditioners bottles. Another novelty related to packaging in their stores is reusable boxes for vegetables made from recycled plastic from Krónan’s operation.

The grocery chain has implemented actions that aim to promote plant-based food choices among the public. These actions align with SD goals number 12 and 13, which are part of their environmental policy. This is realised by encouraging their customers to reduce meat and dairy consumption during a plant-based campaign in January every year which is called "Veganuary ". Veganuary is the most extensive plant-based campaign in the world today. The campaign aims to inspire and support people to try plant-based food. During the month of the campaign, businesses, shops, and restaurants are encouraged to increase vegan options and make them more visible and accessible. Krónan participates in the campaign by promoting plant-based products in the store as well as by advertising them on social media, on posters in stores, and on TV (Krónan, 2021). To make the transition easier for customers, they offer plant-based dinner recipes all year round.

Krónan also collaborates with popular “food influencers” on Instagram who focus on sharing good, easy, and healthy plant-based recipes with their followers. The “food influences” are sponsored by Krónan, and the food they share on their site is all food that can be bought in Krónan. To meet the demand for plant-based products on the market, Krónan states that they have increased the share of this product in their stores considerably (Krónan, 2020).

Krónan took a big step in 2015 when they decided to rearrange all its stores with the hope to increase vegetable and fruit sales. With the rearrangement, all vegetables and fruits are

now the first products customers see when they walk into a Krónan store. This change has led to the constant increase in vegetables and fruit sales, and in 2019 the rise in the sale of fruits and vegetables was 66% higher than in other divisions within the store (Krónan, 2020). Furthermore, results from a consumer survey made by Gallup in 2021 showed that Icelanders consider the variety and quality of fruits and vegetables in Krónan to be the best of the grocery chains in the country (Gallup, 2021)

The Covid pandemic pushed Krónan to open an online grocery store. The online grocery store provides many opportunities to nudge people towards more sustainable food choices. Today, there are already some digital nudges to promote sustainable food choices in Krónan's online store. For example, products certified as eco-friendly, healthy, organic, fair-trade, or plant-based have a prominent icon next to the food product to show that it is certified. There are also educational banners in the online store to help customers understand what each label means. Krónan also has a special category in the online store with plant-based recipes. When the customer clicks on the recipe, all products needed to cook the meal are preselected, facilitating the shopping process and nudging customers to buy healthy and more sustainable food.






Krónan measures its performance according to the performance of the sustainability indicators and evaluates the financial impacts of its sustainability initiatives.

In accordance with the findings from the review by Friede and colleagues, Krónan is the grocery chain in Iceland that has been increasing its turnover the most while also being the grocery chain that has been investing the most in ESG, with a particular focus on environmental issues and public health. In 2020, the turnover increase of Krónan was 20,8%, while they also increased their share of the market (Gunnarsson, 2021). The director of Krónan, Ásta S. Fjelsted, believes that the significant increase in market share and turnover in the last years is thanks to the business's effort into sustainability and public health issues. Results from a consumer survey made by Gallup make it clear that Krónan's efforts in these matters have paid off. The customer's image of Krónan is generally very positive. Most identify Krónan as the leading grocery chain in Iceland regarding environmental issues (Gunnarsson, 2021).



**Table 2**

*Categorisation of green nudges that are in place in Krónan (Krónan, 2020; Krónan, 2021)*

Nudge type	Example	Objective
Descriptive labelling		<p>These logos are made by Krónan. The one to the left to inform customers that the food product is vegan. The logo to the right informs customers that the product is organic (Kronan, n.d.)</p>
Descriptive labelling		<p>These are international logos. The one to the left is the Nordic Swan ecolabel to inform customers that the products meet the environmental standard. The one to the right is the EU ecolabel, awarded to products that meet high environmental standards (European Commission, n.d)</p>
Descriptive labelling		<p>This is the International Fairtrade certification mark. The logo appears on products that have been produced according to Fairtrade political standards.</p>
Descriptive labelling		<p>The logo is made by Krónan. Its objective is to inform customers that the product is soon to expire, therefore the last chance for customers to buy it.</p>
Descriptive labelling		<p>In 2020 Krónan began to add certified logos (EU ecolabel, Fairtrade, organic, vegan, the Nordic Swan) on the product price tags in shelves in their stores (Krónan, 2020). The objective is to make it easier for customers to see if the product is certified or not.</p>

Evaluative labelling

Not in place yet

Visibility enhancement



In 2015 Krónan decided to make vegetables and fruits more prominent in their stores (Krónan, 2020).

Therefore, vegetables and fruits are the first products the customers see when entering a Krónan store.

Visibility enhancement



In the last years the share of environmentally certified products and plant-based options has increased significantly (Krónan, 2020). The increase in share of these products make them more visible.

Convenience enhancement/defaults



Products in smaller packaging are arranged in the front of the shelf and products in bigger packaging at the back or higher in the shelves (Krónan, 2020). The aim is to make it easier to grab the smaller package with the hope of making food waste less likely.

Convenience enhancement/defaults



In 2016, Krónan removed all candy from the shelves next to the cash register. Instead, they offer customers to buy more healthy and sustainable snacks.

Convenience enhancement/defaults



In the online grocery stores, customers can choose to buy all ingredients needed in a recipe. The eco-friendlier products are then pre-selected.

Size enhancement



In 2018 Krónan changed the packaging of their own brand grounded meat and burgers. Now customers can buy the products in smaller and more environmentally friendlier packaging.

Social norms

Not in place yet

Priming



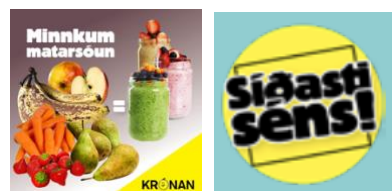
Advertisements in newspapers, tv 's, social media and in Krónan stores, with ideas on plant-based meals. Famous Icelandic home cooks also share ideas with customers through the Krónan website and on social media.

Priming



Posters with the objective to encourage customers to buy eco-friendly hygiene products and plant-based food products. The posters are shared in newspapers, tv's, in Krónan stores and on social media

Priming



Posters and signs in the store and on social media to encourage customers to buy food that is close to expiry date as well as ideas on how this food can be cooked (Krónan, 2020, Krónan, 2021).

Priming



Krónan makes sure to let their customers know when food is in season. E.g., when strawberries are in season, customers are encouraged to buy them.

### 4.4.3 Nettó

Nettó has 19 stores distributed around the country. As mentioned above, the market share is around 11% in their stores. However, those 11% do not include purchases through their online grocery stores

Like Bónus and Krónan, Nettó has the objective to implement the UN Sustainability Goals into its operations. Unlike, Bónus and Krónan, they do not specify which goals they focus on nor how they aim to implement them into their operation (Nettó, n.d.). Nettó's environmental policy is short and not comprehensive. The policy includes ten objectives. In short, their main goals are to; reduce rubbish, reduce food waste, carbon offset their operation, minimise plastic in food packaging, reduce carrier bags' sales by 50%, and establish garbage sorting in every store (Nettó, n.d.). Nettó also states that they aim to minimise the negative environmental impact of their operation. The corporate claims that when they buy products for their stores, they attempt to make sure that their suppliers are reliable and respect their environmental policies. The success of this statement cannot be verified because their environmental policy is lacking in detail. Nettó is the only grocery chain in this overview that only lists outcome goals. Research has shown that, when grocery stores set measurable goals, the goals become more achievable. With measurable goals, the progress can be tracked, and the business can become more transparent to its stakeholders (Siemssen and Lierow, 2021).

Nettó's online grocery store offers many opportunities to promote sustainable food choices and reduce carbon footprint and food waste. Nettó's home delivery cars are all electric, making online purchases more climate friendlier (Nettó, n.d.). Today, Nettó is the only Icelandic store that offers customers to buy food online that is getting close to its expiring date. In the online store, they have made a special category called "less waste". Customers can buy food at an escalated discount within that category, depending on how close the food is to expiring. Nettó does the same in its physical stores; that is, attempts to avoid discarding food that is getting close to its expiry date by selling it at an escalated discount.

To promote plant-based food, Nettó participates in "Veganuary ". During this month Nettó has plant-based products on discount and advertises the products on posters, newspapers, and social media. Additionally, to the plant-based month, two times a year, in February and late August, Nettó has special campaign days named "Health days". These days are dedicated to the health of the customers and the planet's health. During this time of the year, food products certified with the Nordic Swan Ecolabel, organic or plant-based, are discounted in their stores. Nettó also publishes "Nettó's Health days" magazine, which customers can get for free physical or online. Within the magazine, one can find; organic, plant-based-, Nordic Swan ecolabel- and

Fairtrade products advertised plant-based recipes and information and education about the different environmental and health logos that can be found in the Nettó stores.

**Table 3**

*Categorisation of green nudges that are in place in Nettó (Nettó, n.d.)*

Nudge type	Example	Objective
Descriptive labelling	 	<p>Like Bónus and Krónan., Nettó has products certified with the Nordic Swan Ecolabel and the EU ecolabel.</p>
Evaluative labelling		<p>Not in place yet</p>
Visibility enhancement		<p>In the last years Nettó has increased the share of environmentally certified products, especially food and households' products from the label Änglamark with increased share of these product comes increased visibility.</p> <p>In the online store, the Änglamark products are often arranged first. Which makes them more visible</p>
Defaults		<p>Not in place yet</p>
Size enhancement		<p>Not in place yet</p>
Social norms		<p>Not in place yet</p>

Priming



Posters with the objective to encourage customers to buy food that is soon to expire as well as to give customers ideas on how they can use soon to expire food in many ways. (Nettó, n.d.)

Priming



Nettó is in a collaboration with a few individuals that are popular on social media (Nettó, n.d.). The “influencers” share with their followers Änglamark food products as well as recipes using healthy and environmentally certified ingredients from Nettó.

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#### 4.5 Suggestions, based on previous research, on how to increase the use of green nudges in Icelandic grocery stores

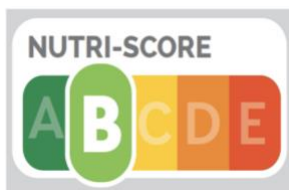
As discussed above, Krónan, Bónus and Nettó all have some sort of environmental policy in place and green nudges to promote sustainable food choices, though to varying degrees. The overview sheds light on the significant difference in ambition between these stores, both when setting and implementing environmental policies as well as green nudges. Krónan is the overall leader in environmental initiatives and green nudges of these three grocery chains. It is interesting to note that Krónan’s market share has been increasing in line with efforts to incorporate sustainability into its operations. At the same time, the market share of Bónus has been decreasing. In April 2021, Krónan, had for the first time in its history higher market share than Bónus (Skaftadóttir, 2022). This might be due to the reason that consumer are demanding businesses to take more social responsibility, and business as usual is simply not enough to excel as a company in today’s corporate environment.

As we have shown, each store has some descriptive labelling nudges in place. Krónan went a step further than both Nettó and Bónus by designing their own logos, thereby facilitating customers to identify vegan, organic, and eco-labelled products. A descriptive labelling nudge method that has still not been carried out in an Icelandic grocery store is to give customers information about the carbon footprint of a product. This way, customers can be nudged towards more climate friendlier food.

None of the Icelandic grocery stores have implemented evaluative labelling green nudges. Evaluative information is considered even more facilitating than descriptive labelling to help customers make informed decisions. Both the UK and France have implemented traffic light labelling to guide customers towards more nutritious food and create a healthier food environment (WHO, 2017). The WHO in Europe has called for countries to develop and implement front of pack labelling, such as traffic light labelling, as shown in figure 1. The evaluative labelling could then act as an incentive for food operators to improve the nutritional value of the food (WHO, 2017; Harrison-Dunn, 2014).

**Figure 1**

*Nutri score traffic light labelling (WHO, 2017)*



In the context of sustainable food choices, similar traffic light labelling could be done to guide people towards more environmentally friendlier food. This could also act as an incentive for food operators to improve the sustainability value of the food that is sold. This is especially relevant when considering the increase in ‘store brand products’ (Pulker et al., 2018).

Visibility enhancement nudges are in place in all three grocery chains. However, the quality and quantity of these nudges vary substantially between them. The most common visibility enhancement nudge is the increase in the availability of sustainable products such as plant-based products and products that are certified as environmentally friendly. The demand from consumers in this area is increasing progressively (The International Trade Centre, 2019). A survey made by the EU market for sustainable products showed that 85% of retailers in Europe reported an increase in the sale of sustainable food products in the last five years, and 92% of retailers expect the growth to continue in the next five years (The International Trade Centre, 2019).

Additionally, a survey across Europe showed that 57% of consumers are willing to change their food purchasing habits to reduce their carbon footprint. Furthermore, 71% of European consumers consider the traceability of the food product very important and say they are willing to pay more if this is provided (Haller, Lee and Cheung, 2020). Therefore, it seems logical for the Icelandic grocery stores to meet the demands of their customers by increasing

the share of sustainable products even further. As of yet, the share of these products in the stores remains low (Bernardes et al., 2018).

Another visibility enhancement nudge is incorporating sustainable products such as the vegetarian options in the existing assortment (Vandenbroele et al., 2019). The stores in this overview all offer the meat substitute separately on a special shelf. This way, the meat substitute is skipped by all that are not already familiar with the products. By placing the plant-based food next to the meat products, non-users become more familiar with the products, making them more likely to buy them (Vandenbroele et al., 2019). I suggest that Bónus, Krónan and Nettó begin to incorporate the meat substitutes within the existing assortment of meat-based products.

Visibility enhancement nudges in an online grocery store environment are also a promising tool to increase sustainable food purchases. Sustainable food products should be positioned first on the website to make them more prominent, as explained in chapter 3.1.1. This visibility enhancement nudge is currently absent from all three grocery chains discussed in this thesis.

Lastly, presenting plant-based, organic, and eco-labelled products at eye level on shelves in the store needs to be done more. Today, Krónan is the only grocery chain in this overview that utilises this nudge. However, the author realises that this nudge is not as trivial to implement as it seems because companies pay a premium to have their products placed in noticeable locations. Therefore, grocery stores might be hesitant to implement these nudges if they are to their financial detriment.

Defaults/convenience green nudges are barely used among the leading grocery stores in Iceland. As with visibility enhancement nudges, Krónan is the only store that has adopted the use of defaults/convenience nudges to some degree. In the case of Krónan, this was done by moving the vegetable and fruit division to the beginning of the store and moving the candy from the shelves next to the cash registers, a move that lost the store's regular revenue from candy suppliers. Krónan, Bónus and Nettó should put more effort into implementing default nudges since the default option is often preferred over other alternatives (Kahneman et al., 1991). Defaults are especially suitable in an online grocery store environment. For example, when customers look for a particular food product in the online store database, the default/preselected product should be environmentally certified.

Size enhancement green nudges are in place in both Krónan and Bónus. Both stores have reduced the amount of packaging and the material used in packaging. Such nudges should be implemented more frequently. Nettó and Bónus are also encouraged to do the same as



Krónan and avoid selling food, in unreasonable bulk, at a discount to minimise the risk of household food waste.

I also suggest that when customers choose between different packaging sizes in online grocery stores, the size enhancement nudge becomes personalised. For example, if a customer selects to buy ten small cans of “skyr” in the online store, a suggestion will pop up, explaining that four large cans of “skyr” are the same amount as ten small cans. However, less packaging is used.

Even though social norms have proven to be a successful way to nudge people (Thaler and Sunstein, 2008; Allcott, 2011; Demarque et al., 2015), their use is limited in the leading Icelandic grocery stores. In this overview, the author found only one example of a social norm nudge in Bónus. The grocery chains are all encouraged to utilise this nudging method to promote sustainable food choices, both in their physical stores and online stores. This can be done by making signs, posters or banners with short and catchy messages such as “the majority of people buy at least one environmentally certified product”, “most of our customers remember their reusable bags”, or “Customers in this store buy on average six different kinds of vegetables”. Nettó and Krónan could also use social norm messages in their online stores. For example, when a plant-based product increases in popularity, they could advertise it as “this product is trending now”. The stores can also use celebrities in Icelandic society to influence people’s food purchases by activating a norm related to sustainable food choices.

The last nudging category in this review is priming nudges. Priming nudges are the most used nudges to promote Icelandic consumers to purchase more sustainable food. The author found an example of priming nudges in all three stores. In all cases, the priming nudges were visual stimuli such as posters. Even though visual priming stimuli are the most used nudges, the stores can always do better. In the grocery store environment, there is a jungle of environmental certification logos on food products, all trying to catch the customer’s attention. By priming certain logos, such as the Nordic Swan Ecolabel, the customers might be quicker and more likely to identify the logo, thus making them more likely to buy products certified with Nordic Swan Ecolabel. The grocery chains are encouraged to use other priming nudges, such as taste and audition nudges. An example of a taste nudge would be to offer customers to taste sustainable products such as oat milk or tofu. Customers could also be primed with audition stimuli such as a natural sound. Studies have shown a positive relationship between waterfall sound and the willingness to buy sustainable products (Spendrup, Hunter and Isgren, 2016).

### **4.5.1 Embracing technology**

All the three grocery chains in this overview could take more advantage of technology to stimulate their customers toward desired behaviour. We do not need to go further than Scandinavia to see that grocery stores abroad utilise technology to a much higher degree, both with the objective to obtain more information about purchasing behaviour and nudge customers into specific directions.

In Norway, all the leading discount stores, Rema 1000, Kiwi and Coop Extra, provide an app that allows customers to become ‘members’ of the store and rewards them with discounts on some purchases. The customers must identify themselves at checkout using the app to get discounts. This code, in turn, connects their purchases to their specific person allowing the stores to accumulate data on the purchasing behaviours of individuals over time. In the case of Coop Extra, a one-time payment is required for accessing the discounts, but for the other stores, the app is free of charge for the consumer. The discounts provide a clear economic incentive for most customers, while the stores gain valuable customer data for minimal effort.

Bónus is, without a doubt, the grocery chain that can make the most improvements in this field, with no online store nor an app. However, as mentioned in section 4.4, both Krónan and Nettó launched their apps in 2021 and online stores.

An app and online store can be an excellent way to nudge sustainable food choices. The two can be used to collect data about purchasing behaviour, which can be utilised to make personalised suggestions to customers; as we explained, it is already being done in Norway. Krónan and Nettó seem to be moving in this direction with their newly established apps. This data can be used for various personalised green nudges. For example, suggest how customers can use the food they purchased to minimise food waste. Another green nudge to reduce food waste would be to inform the customer in an app which products in the store are on discount due to being close to the expiry date. By informing the customers before going to the grocery store, they are more likely to plan their meals according to which food is on discount. The stores can also suggest recipes using food close to the expiry date.

To incentivise customers to purchase greener alternatives, the store could give targeted coupons for a greener variant of a product type they already buy. Additionally, the store could aim to inform customers about the carbon footprint of the food they buy. This could be done by monitoring the shopping basket in the online store. The customer could then be informed of each item's carbon footprint and recommendation on lower carbon footprint food in accordance with the food they buy. This could be taken even further by comparing the carbon footprint of

the customer's newest shopping basket to their previous shopping basket. Customers that lower their carbon footprint over a specific period could be rewarded with coupons to use in the store. Social norm feedback could also be used in this situation, such as informing customers whether their shopping basket has a higher or lower carbon footprint than the average customer. To avoid the social norm to backfire, it is necessary to add an injunctive norm for customers with a lower carbon footprint than the average, such as "Thank you for helping the environment". To encourage customers with low carbon baskets even further, they could be rewarded with coupons that they could use in the store.

## 5 Visual nudge in a grocery store in Iceland- a case study

The author of this thesis analysed a change in the placement of Eco-labelled products in one of Nettó's stores. The case study is analysed from the perspective of behavioural science, more specifically, as a visibility enhancement nudge, as has been described in chapter 3.1.

In October 2020, the grocery chain Nettó decided to change the line-up in one of its stores. The change involved moving eco-labelled products, which were previously placed in a separate section in the store, to be spread around the store next to similar products. The store is in the small town, Keflavík, located on the Reykjanes Peninsula, 47 kilometres away from Reykjavík. Alongside the Keflavík store, a comparison Nettó store was analysed where no changes had been made in the placement of eco-labelled products. The comparison store is situated in the town of Grindavík, which is also located on the Reykjanes Peninsula. From now, Nettó, Keflavík will be referred to as the test store while Nettó, Grindavík will be referred to as the control store. To narrow down the analyses, the author focused on the change in sales of all 'Änglamark' branded products which are all environmentally certified.

### 5.1 Änglamark

The grocery chain Coop created the Änglamark brand in Sweden in 1992. From the beginning of the establishment of Änglamark, the brand's objective has been to promote sustainable consumption where both health of the individual and the environment are at the forefront (Ministry of Environment of Denmark, n.d.). The environmental impact of all Änglamark products is measured, and all their products are ecologically certified. Many of the just over 300 Änglamark products are also certified as organic and/or fair-trade (Coop, n.d.). To fulfil its objective to promote sustainable consumption, Änglamark emphasises simplifying the decision-making process for customers when buying environmentally friendly products. Due to this, the Änglamark logo was designed with simplicity in mind. All Änglamark products are characterised by the 'Ä' logo, standard typography, simple illustration, and homogenous design as shown on figure 2 (Coop, n.d.).

#### Figure 2

*Example of the look of Änglamark products (Brandingsource, 2018)*



The brand's intention was always to differentiate itself from others based on ecological attributes. That seems to have worked well for the firm since it has managed to gain a competitive advantage from eco-branding. In Sweden, Änglamark has been rated the greenest brand in the country for eight years in a row and is considered the greenest brand in Norway from 2018-to 2021 (Coop, n.d.). Moreover, Änglamark has also been selected as the most sustainable brand in the food industry (SB index, 2020). One of the reasons for the success of the Änglamark products is their affordability compared to other eco-labelled products, which makes their products accessible to a broader range of consumers. The reason for its competitive price is that Coop Sweden implemented a policy that states that it does not charge a higher premium for Änglamark products compared to conventional products (Chkanikova and Lehner, 2015).

## **5.2 Changing the position of eco-labelled products**

Before the change, the test store, like all other Nettó stores, had a specific sector in the store dedicated to environmentally certified products. This is, therefore, where most 'Änglamark' products were placed. Along with eco-labelled products, this special section in the store also included food products that Nettó classifies as "health products", such as vitamins, protein powder and sugar-free candy. Due to the immense increase in interest and sale of eco-labelled products and health products, Nettó decided to try out incorporating the environmentally certified products and the health products into the normal shelves within the store. This change was first tried in the test store.

Nettó's aim with this change was to increase the sale of these products even further. By incorporating the products on the same shelves as the 'normal' products, these products become more visible, especially to customers who were not familiar with the products before the change (Vandenbroele et al., 2019). By placing the eco-labelled Änglamark products next to other products, the hope is that non-users start to get familiar with the Änglamark products and begin to make them a part of their grocery shopping list. As was mentioned in chapter 3.1, incorporating eco-labelled products with conventional food products can lead to mixed results. Previous results showed that price is a critical factor. Van Harpen and colleges (2015) showed that sustainably certified meat at a low price increased in sales, while these products reduced in sales at an intermediate price. However, when these products were sold at a high price, there was no change in sales. Based on previous research, I expect that;

Hypothesis 1: There will be an increase in the sale of Änglamark products at a low price that share shelves with conventional products.

Hypothesis 2: There will be a decrease in the sale of Änglamark products at an intermediate price that share shelves with conventional products.

Hypothesis 3: There will be no change in sales of Änglamark products at a high price that share shelves with conventional products.

### 5.3 Measures

Data for the sale of all Änglamark products in the test store and the control store from 2020 and 2021 were analysed and compared in order to understand the impact of the changes. This data was provided freely by Nettó for this thesis. As shown in table 4, the Änglamark products analysed in this study were the 78 unique products that were both sold in 2020 and 2021 and sold in both stores, both years. This was done to make the comparison between the stores fair and get a clearer view of how the change in the placement of these products impacted product sales.

**Table 4**

*Products that were sold in 2020,2021, in both stores and both years.*

	Products offered in 2020	Products offered in 2021	Products offered in both 2020 and 2021	Products offered in both 2020 and 2021 and available in both stores
Test store	87 products	130 products	78 products	78 products
Control store	82 products	130 products	82 products	78 products

### 5.4 Results

First, we look at the amount of products sold and the turnover of these products without accounting for the difference in Änglamark products sold between years and stores.

From 2020 to 2021, there is a notable increase in the number of various Änglamark products for sale in all Nettó stores. As shown in Table 4, in 2020, there were 87 different Änglamark products to choose from in the test store. At the beginning of 2021, customers could choose from 130 different Änglamark products. This corresponds to a 49,4% increase in the number of unique Änglamark products sold in the test store.

With the increase in the variety of products to choose from, there was also a significant increase in the amount of Änglamark products sold, both in the test and control store, as shown

in table 5 and 6. From 2020 to 2021, there was a 6% increase in the amount of all Änglamark products sold in the test store. The increased amount of sold Änglamark products was considerably more in the control store, or 60%. As has been mentioned, the change in the placement of Änglamark products was done in late October 2020 in the test store. Even though the amount of Änglamark products sold increased from 2020 to 2021, there was a 1.5% decrease in turnover between the two years, without accounting for inflation, as shown in Table 5. On the contrary, the control store showed a substantial increase in turnover or 48,3%.

**Table 5**

*The amount of Änglamark products sold and turnover in the test store, 2020-2021*

	2020	2021
Amount sold	9120 products	9664 products
Turnover	3.597.316 ISK	3.541.442

**Table 6**

*The amount of Änglamark products sold and turnover in the control store, 2020-2021*

	2020	2021
Amount sold	3302 products	5281 products
Turnover	1.311.532 ISK	1.945.357

Of the 78 products analysed, 49 of the Änglamark products had their sales reduced in the test store, while 33 increased in sales. During the same year in the control store, 24 products reduced in sales, three products did not change in sales while 55 products increased in sales. Furthermore, if we compare the turnover from these 78 products in the two stores, there is a 28,6% increase in turnover in the control store as opposed to a 14,8% decrease in the test store. When looking at the percentage change in the amount of sold Änglamark products there is also a notable negative trend in the test store, as shown in table 7.

**Table 7***Change in turnover and amount of sold Änglamark products*

	Change in turnover of Änglamark products in 2020- 2021	Change in the amount of Änglamark products sold in 2020-2021
Test store	-15%	-13%
Control store	+29 %	+31%

Before analysing the change of specific products after the change of their placement, an overview of the ten products that reduced and increased the most in sales after the change are provided in table 8 and 9. For a comparison, the sales change of the same products in the control store are also provided. The sales data for all Änglamark products before and after the change in both stores are provided in Appendix A and Appendix B.

**Table 8***The ten products that reduced the most in sales in the test store after the change in placement and a comparison to the control store.*

Food product	Price category	Change in test store	Change in control store	Difference between stores
Coconut milk	Intermediate	-154%	+98%	252%
Raisins	High	-88%	+25%	113%
Squash seeds	Intermediate	-85%	-66%	19%
Chia seeds	Intermediate	-81%	+88%	169%
Almonds	High	-69%	+674%	743%
Cocoa	Intermediate	-65%	+44%	109%
Quinoa black	Intermediate	-67%	+69%	136%
Canned tomatoes	High	-55%	+2900	2955%
Honey	Intermediate	-48%	-10%	38%



**Table 9**

*The ten products that increased the most in sales in the test store after the change in placement and a comparison to the control store.*

Food product	Price category	Change in test store	Change in control store	Difference between stores
Dark chocolate	Intermediate	+2800%	-73%	2727%
Blackberry jam	Intermediate	+488%	+71%	417%
All-purpose spice	Intermediate	+136%	+3%	133%
Blueberry jam	High	+86%	+53%	33%
Pesto Rosa	Intermediate	+85%	+113%	28%
Pesto Chili	Intermediate	+81%	+40%	41%
Liquorice	High	+82%	+43%	39%
Filled Liquorice	High	+69%	94%	25%
Pasta sauce	Intermediate	+28%	-54%	82%

#### **5.4.1 Simple Änglamark products at an intermediate and high price**

There is a noteworthy difference when observing how the sales of specific food products changed differently between the two stores, as shown in tables 8 and 9. The difference between the two stores is most significant when looking at raw goods such as coconut milk, canned tomatoes, raisins, almonds, and chia seeds. Of the 78 products that were included in the analysis, 32 products were categorised as a raw product. Of these 32 products, 25 products reduced in sales after the change, four products did not change in sales and only one raw product increased in sales in the test store. In the control store, only four products categorised as a raw good product reduced in sales during the same time while 28 did not change or increased in sales.

By incorporating the Änglamark canned tomatoes on a shelf with similar products such as the Coop tomatoes, shown in figure 3, there was a decrease in the sale of Änglamark canned tomatoes. The Änglamark tomatoes cost 921 ISK/kg compared to 498 ISK/kg for the Coop tomatoes. This makes the Änglamark canned tomatoes 85% more expensive than the ‘Coop’ tomatoes. The product is therefore categorised as a high price product. Contrary to what was expected, the sale of Änglamark tomatoes reduced by 51% in the test store while increasing by 2840% in the control store during the same period.

### Figure 3

*The placement of canned tomatoes in the test store (Nettó, n.d.)*



Almonds are another example of a raw good that decreased in sales after its location changed to a shelf with a cheaper ‘Coop’ almonds. The Änglamark almonds are the most expensive almond option in the store and 60,1 % more costly than the Coop almonds. Due to their price, I classify the Änglamark almonds as a high-priced product. After the change, the sales of these almonds decreased by 69% in the test store. However, during the same period in the control store, the sale of Änglamark almonds increased by 674%. This result is contrary to hypothesis three.

### Figure 4

*Änglamark almonds in Nettó and a similar competing product (Nettó, n.d.)*



Coconut milk is yet another raw good that suffered reduced sales after its position was changed in the store. After the change, the Änglamark coconut milk was placed on a shelf cheaper and more expensive coconut milk. I, therefore, classify the Änglamark honey as an intermediate priced product. After the change, the Änglamark coconut milk reduced in sales by 154% in the test store while increasing sales by 98% in the control store during the same period. These results are consistent with hypothesis two.

### Figure 5

*Änglamark coconut milk in Nettó and a lower and higher priced competing product (Nettó, n.d.)*



### 5.4.2 More complex Änglamark products at a low, intermediate, and high price

When looking at more complex food products from table 9, that is, products that include more than one ingredient, the results become more favourable compared to the raw goods.

After the Änglamark pesto changed its position among other pestos in the test store, the sales increased by 81%. However, the same pesto in the control store increased in sales as well, but the increase was slightly less or 41%. There are examples of cheaper and more expensive pestos, as shown in figure 6. Therefore, we classify the Änglamark pesto as an intermediate priced product. These results are inconsistent with the prediction of hypothesis two.

**Figure 6**

*Änglamark pesto in Nettó and a lower and higher priced competing product (Nettó, n.d.)*



Änglamark pasta sauce is another complex product that increased in sales after being placed on shelves with similar products in contrast to the decrease in sales of raw Änglamark products at an intermediate price. After the changed location the sauce increased in sales by 28% in the test store. However, at the same time in the control store the sauce decreased by 54% in sales. We classified the sauce as an intermediate price product since there were examples of cheaper and more expensive pasta sauces on the same shelves.

**Figure 7**

*Änglamark pasta sauce in Nettó and a lower and higher priced competing product (Nettó, n.d.)*



Änglamark 70% dark chocolate was the product that increased the most in sales after its position was changed in the store. In 2021, the sale of Änglamark chocolate increased by 2800% compared to the 2020 numbers. During the same period in the control store, the same chocolate has its sales reduced by 71%. There are examples of cheaper and more expensive dark

chocolates on the same shelf as Änglamark chocolate. We, therefore, classify the Änglamark chocolate as an intermediate priced product. The increase is contrary to what was expected.

### Figure 8

*Änglamark chocolate in Nettó and a lower and higher priced competing product (Nettó, n.d.)*



Liquorice is another product that increased significantly in sales after it changed its position in the test store. In 2021, the product increased its sales by 82% in the test store. The increase was also very similar in the control store or 43% during the same period. The Änglamark liquorice is significantly more expensive than other liquorice sold in the store, and we, therefore, classify it as a high-priced product. Thus, this product increase goes against hypothesis three, which predicted that there would be no change in the sale of Änglamark products that cost significantly more than similar competing conventional products.

### Figure 9

*Änglamark liquorice in Nettó and a lower and higher priced competing product (Nettó, n.d.)*



## 5.5 Discussion

The impact of changing the placement of Änglamark products is both consistent and inconsistent with what we expected. Firstly, the change in the placement of Änglamark products seems to have had an overall negative impact on sales of these products. While there was a decrease in sales of Änglamark products overall in the test store, there was a significant increase in sales of these products in the control store. As previous research has shown, when an environmentally certified product at an intermediate price is placed into the existing assortment, the product is likely to reduce in sales (Van Herpen et al., 2015). This is indeed what happened when looking at the product sales of Änglamark coconut milk. However, when looking at the

sales of a raw goods at a high price such as the Änglamark almonds and canned tomatoes there was also a significant reduction in product sales which is inconsistent with what I expected.

Almost all Änglamark products that I classified as raw goods, such as canned tomatoes, almonds, raisins, honey, and chia seeds reduced in sales after being put on shelves with other similar products. This is in stark contrast to the control store, where most of these products increased slightly in sales during the same time. These results suggest that consumers are unwilling to pay a significantly higher price or a slightly higher price for environmentally certified raw goods when consumer is presented with product on a lower price. I would have expected customers to prefer an environmentally certified product such as an Änglamark over a non-certified product if both products were sold at a low price. However, there was no example of this in the data.

When the Änglamark product was more complex, the new placement of these products had a more favourable impact. Products containing several ingredients, such as pesto and sauces, increased slightly in sales after the change. However, there was a similar increase in sales of these products in the control store during the same period. So why would complex Änglamark product behave so differently after the change compared to simpler Änglamark products? The increase could potentially be explained by the positive relationship that has been found between taste and eco-labelled example, as was written about in chapter 3.1 (Sörqvist et al., 2013). For example, two different jars of pesto can have vastly different ingredients and recipes producing a very different outcome. One the other hand, to a consumer it may be harder to distinguish a difference between for example two different cans of tomatoes. Making a slightly higher price for Änglamark tomatoes harder to justify. However, when it comes to a more complex product with a recipe, the difference in taste and ingredients might lead customers to choose an intermediate priced product. This can possibly explain why product such as the Änglamark pesto increased in sale while the Änglamark canned tomatoes plummeted in sales.

Another complex product of note is the Änglamark pasta sauce. In contrast to the raw goods at an intermediate price that reduced in sales the Änglamark pasta sauce has a slight increase in sales after its placement in the store was changed.

Änglamark Dark chocolate, at an intermediate price, was interestingly the product that increased the most in sales in the test store while it reduced slightly in sales in the control store during the same period. Chocolate certainly fits the definition of a complex product rather than a raw good, but why would the change be so drastic for this product specifically? In this scenario

we suspect yet another confounding factor to be at play. The explanation for the 28fold increase might in part be explained by a cognitive bias where people compensate for unhealthy eating by choosing a product that is good for the environment.

The ‘Halo effect’ might also be a factor that explains why people are likelier to purchase an eco-labelled chocolate when it is placed among other candy. People might believe that an eco-labelled chocolate is not only ‘healthier’ for the environment but also healthier for themselves compared to other candy. The explanations for the increase in the chocolate above might also be the reason for the increase in the sale of Änglamark liquorice, despite its high price.

As mentioned, the turnover for Änglamark products increased significantly in the control store, the year after the change, while the turnover decreased in the test store. It, therefore, seems that the change did not have the desired effect. The turnover increase in the control store emphasized that interest in eco-labelled products is increasing in Icelandic society.

It is important to note that our analysis does not come without limitation. The product sales data are from two stores situated in small Icelandic towns. Due to the small size of these towns the size of the datasets unavoidably becomes small. Further research is therefore required to be able to generalise these results. However, Nettó and other Icelandic grocery stores can use these results as a starting point to understand the effect of a visual nudge such as this one. These results emphasise that grocery stores are a complex environment and change such as this one does not necessarily lead to the change that is expected.

Our observation on the effect of incorporating eco-labelled products into the normal shelves within the stores shows an overall decrease in sales of these products. However, as has been discussed, for specific products, the effect from this change might be favourable.

## **6 General discussion and conclusion**

The objective of this thesis was threefold. Firstly, to introduce the idea of a “nudge” and explain the theories and methods from psychology and behavioural science that the nudge method utilises in behavioural interventions in the context of promoting sustainable food choices. The first part of the thesis also included section with real life examples on how insights from behavioural science have been applied to public policies across the world. The second aim of this thesis was to make an overview of green nudges and environmental initiatives in place in the leading Icelandic grocery stores. The overview was supplemented by suggestions, based on previous research, on how the grocery stores can promote sustainable food choices with the nudging method. The third object was to analyse, using raw sales numbers, the impact of a visual nudge in an Icelandic grocery store.

Research from the last decades in psychology and behavioural science have shown that humans have bounded rationality in decision making due to heuristics, biases, and time constraints which leads to systematic errors. The nudging method attempts to utilise these systematic errors to change behaviour in a way that the change benefits the individual and society. There are many different types of nudges and various way to categories them. In this thesis the nudges were categories based on how they influence the individual. Namely, individual cognition, behaviour or affect.

The overview of the grocery stores showed that all the leading grocery chains have made some effort to reduce their climate impact. However, their efforts vary greatly. The overview made it clear that Krónan, the grocery chain with the second largest market share, is the leader among Icelandic grocery chains in corporate responsibility. Krónan sees the increasing expectations of consumers to take responsibility for their climate impact, as an opportunity to differentiate themselves from their competitors. Krónan’s effort seems to pay off since they steadily increase their share on the Icelandic grocery chain market.

The environmental initiatives that are in place in Bónus and Nettó are less ambitious compared to Krónan. Bónus, the grocery chain with the largest market share, has the opportunity to increase their efforts to reduce its climate impact on levels in their operation. Today their effort consists of little more than a waste sorting policy and a policy to stop the use of plastic bags. The plastic policy is according to Icelandic law. Being the grocery chain where most Icelanders purchase their groceries, Bónus’ impact on the Icelandic food sector is immense. With its power, they have the ability to promote sustainable food choices and reduce climate impact in the Icelandic food sector. Nettó, the third grocery chain that we reviewed in

this thesis, has also an opportunity on all levels in their operations to reduce its own and its customers' climate impact

Nudges to promote sustainable food choices are in place in all three grocery chains. Like before, Krónan has the most variety and quantity of green nudges in place. All three stores have the opportunity to nudge their customers to a higher degree toward more sustainable food choices. Many of the suggestions on nudges to reduce climate impacts of customers in chapter 4.3. are already in place in other countries such as Sweden. It is suggested that the Icelandic grocery stores use the success stories from other grocery chains in Scandinavia as an encouragement and role model to implement more nudges to promote sustainable food choices.

The overview of the environmental initiatives and nudges to promote sustainable food choice is the first of its kind in Iceland. The aim is to make Icelandic grocery chains and their stakeholders aware of where the grocery chains stand regarding these matters. The hope is to encourage the stores to increase their efforts to reduce the climate impact of their operations and their customers.

The third part of this thesis focused on analysing product sales data from a store belonging to the Icelandic grocery chain Nettó. The store changed the placement of environmentally certified products. The change involved moving the products from a shelf dedicated to eco-labelled products and incorporating the products into the normal shelves in the store. The change led to mixed results. Contrary to what previous research has shown, the product complexity seemed to be an equally important predictor of the products' success as the product price. Generally, raw goods decreased in sales when they were incorporated into the normal shelves. When the overall sales data were compared to the control store, we saw that the change had an overall negative impact on the sales of environmentally certified products

These results emphasise that more research on nudges to promote sustainable food choices are needed. Future research should aim to understand better how the sales of environmentally certified products are impacted by nudges such as the one analysed in this thesis. As we observed, it is also important to understand how different products are affected differently by the nudges to find the most effective nudge for each product and scenario. It would also be beneficial to understand how nudges impact people differently. Grocery stores could then utilise that knowledge in an online grocery store environment by individualising the nudges.

Even though it is crucial to implement nudges to reduce consumers' climate impact, it is essential to remember that nudges will not save us from climate change. Soft policy tools such



as nudges cannot replace strong policy tools such as a carbon tax and bans. Nudges should also not move the responsibility from businesses, industries, and governments towards the individual. The choices of individuals have a minor impact when looking at the big picture, even though their impact may not be underestimated. The most significant change needs to happen on the business, industry, and governmental levels, and nudges should be used to supplement these changes.

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## Appendix A: Product sales data for Nettó, Keflavík

38	Anglamark Hlaup Bangsar 150g Lífrænt	16565	20723	4158	25.101116812556594
11	Anglamark Steiktur Laukur bg Lífrænn	57211	75611	18400	32.16164723567147
13	Anglamark Pastasósa m/grænmeti 420g Lífræn	38597	48386	9789	25.362074772650722
26	Anglamark Mæjónes 260g Lífrænt	47762	52489	4727	9.896989238306604
44	Anglamark Lasagna án eggja 500g Lífrænt	21881	24033	2152	9.835016681138887
6	Anglamark pasta Fusilli lífrænt 500g	60892	84902	24010	39.43046705642777
36	Anglamark Kryddkvörn Sjávarsalt jurtum 50g Lífrænt	24938	31136	6198	24.853637019809128
7	Anglamark Dressing hunangs/sinnep 400g Lífræn	98444	123450	25006	25.40124334647109
3	Anglamark Penne Heilhv.lífrænt 500g	76822	95480	18658	24.28731352997839
56	Anglamark Súkkul.hnappar mjólkur 100g Lífrænt	11969	13708	1739	14.529200434455678
5	Anglamark Hunang squeeze 250g Lífrænt	123940	145282	21342	17.219622397934483
27	Anglamark Ólífur grænar 350/200g Lífrænar	32916	43416	10500	31.89938024061247
64	*Anglamark Kryddkvörn Paprikumix 50g Lífrænt	7025	8309	1284	18.277580071174377
34	Anglamark Lakkrís fylltur 120g Lífrænn	15787	26789	11002	69.69025147273072
47	Anglamark Marsipan 200g Lífrænt	20008	36137	16129	80.61275489804078
45	Anglamark Lakkrís finnskur 120g Lífrænn	9479	17322	7843	82.74079544255724
57	Anglamark Bláberjasulta 340g Lífræn	11800	22008	10208	86.50847457627118
4	Anglamark Pesto Rosso 140g Lífrænt	67484	124979	57495	85.19797285282438
0	*Anglamark Tómatpaste Túpa Ök 200g Lífrænt	74825	124902	50077	66.925492816572
21	Anglamark Pesto Chili Cream 135g Lífrænt	26766	48546	21780	81.37188971082718
18	Anglamark Kapers 105/60g Lífrænt	14587	16059	16472	12.92246520874751
15	Anglamark Kryddkvörn Allra handa mix 50g.Lifr.	24371	57531	33160	136.0633539862952
28	Anglamark Salthnetur lífrænar 200g.	13229	16826	3597	27.190263814347265
51	Anglamark Brómberjasulta 340g Lífræn	3324	19551	16227	488.1768953068592
19	Anglamark Súkkul.plata 80% lífrænt	540	12094	11554	2800.62963

Vara	Sala 2020 [kr]	Sala 2021 [kr]	Breyting [kr]	Sala Breyting %	
70	Anglamark Rúsinur 250g Lífrænar	80776	9570	-71206	-88.15242151134001
63	Anglamark Graskersfræ 350g Lífræn	92550	13930	-78620	-84.94867639113993
67	*Anglamark Chia fræ 300g Lífræn	55869	10443	-45426	-81.30805992589808
74	*Anglamark Heslihnatur 150g Lífrænar	25241	7598	-17643	-69.89818153005032
65	*Anglamark Tómatósósa 420g Lífræn	28712	6939	-21773	-75.83240456951798
68	Anglamark Hnetusmjör Creamy 350g Lífrænt	47819	15474	-32345	-67.6404776344131
52	Anglamark Móndlur 100g Lífrænar	61339	22651	-38688	-63.07243352516344
76	Anglamark Quinoa rautt 300g Lífrænt	12277	4758	-7519	-61.244603730553074
75	Anglamark Buglur 400g Lífrænar	12861	4837	-8024	-62.39017183733768
61	Anglamark Kakó 125g Lífrænt	30374	10621	-19753	-65.03259366563509
48	Anglamark Tómatar hakkaðir 390g Lífrænar	30794	15320	-15474	-50.25004871078782
8	Anglamark Hunang 425g Lífrænt	300389	153527	-146862	-48.89060518194741
72	*Anglamark Hnetumix 5x11g Lífrænt	10156	4308	-5848	-57.58172508861756
73	Anglamark Quinoa svart 300g Lífrænt	15399	6315	-9084	-58.99084356127021
22	Anglamark Tómatar m.kryddi 390g Lífrænar	53146	23882	-29264	-55.06341022842736
66	Anglamark Nautakraftur fjót 180ml Lífrænn	18296	13014	-5282	-28.869698294709227
69	Anglamark Perlubýgg Ljóst 500g Lífrænt	12851	5456	-7395	-57.544159987549605
29	Anglamark Súkkul.plata sítr 100g Lífrænt	60414	37605	-22809	-37.75449399145893
41	Anglamark Súkkul.dökkt appelsínu 100g Lífrænt	35320	19612	-15708	-44.47338618346546
33	Anglamark Rúsinur 9 lítil box Lífrænar	62759	48712	-14047	-22.382447139055753
53	Anglamark Brún hrísgrjón 1kg Lífræn	38379	25224	-13155	-34.27655749237864
24	Anglamark Súkkul.plata karam/sjávarsalt 100g Lífræn	62561	40430	-22131	-35.37507392784642
20	Anglamark Súkkul.plata bláb 70% Lífrænt	63393	40844	-22549	-35.57017336298961
31	Anglamark dressing Hvítlauks 400g Lífræn	72153	37113	-35040	-48.56346929441603
54	Anglamark Tómatósósa 500g Lífræn	23697	12691	-11006	-46.444697641051604
59	Anglamark Quinoa hvítt 300g Lífrænt	23827	19496	-4331	-18.176858186091412
37	Anglamark Máismjöl lífrænt 500g	46191	32575	-13616	-29.477603862224242
30	Anglamark Grautagrjón 500g Lífræn	67122	46209	-20913	-31.156699740770538
49	Anglamark Tyttuberjasulta 340g Lífræn	30366	24301	-6065	-19.972996114074952
2	Anglamark Spaghetti Heilhv.500g Lífrænt	136090	106809	-29281	-21.51590858990374
1	Anglamark Kókosmjólk Lífræn 330ml	194963	142951	-52012	-26.67788247000713
60	Anglamark 5-kornablanda Lífræn	14095	9861	-4234	-30.039020929407588
58	Anglamark Kjúkl.kraftur fjót 180ml Lífrænn	19615	17214	-2401	-12.240632169258221
25	Anglamark Sólkjarnafræ 375g Lífræn	52208	50115	-2093	-4.008964143426295
12	Anglamark Smjörbaunir 380g	52179	35219	-16960	-32.50349757565304
16	Anglamark Pastasósa m/jurtum 420g Lífræn	46790	44697	-2093	-4.473178029493482
50	Anglamark Lasagnesósa Bachamel 500ml Lífræn	21999	24748	2749	12.496022546479384
71	Anglamark Linsubaunir 300g Lífrænar	9527	8987	-540	-5.668101186102656
39	Anglamark Borlotti baunir 400g Lífrænar	34657	34267	-390	-1.1253137894220504
55	Anglamark Súkkul.hnappar dökkir 100g Lífrænt	16693	16283	-410	-2.456119331456299
35	Anglamark Raspur 400g Lífrænn	27516	20034	-7482	-27.191452245965987
10	Anglamark Ávaxtasnakk jarðarb 45g Lífrænt	46524	46733	209	0.44923050468575354
46	Anglamark Súkkul.hnappar hvítir 100g Lífrænt	24519	23288	-1231	-5.020596272278642
43	Anglamark Súkkul.bökunar 180g Lífrænt	27221	28417	1196	4.393666654421219
23	Anglamark Pesto Genovese 140g Lífrænt	53216	49830	-3386	-6.362748045700541
17	Anglamark Kryddkvörn Heill Pipar 50g Lífrænt	56625	57311	686	1.2114790286975718
14	Anglamark Ávaxtasnakk epla 45g Lífrænt	33842	37977	4135	12.218545003250398
42	Anglamark Hörfræ 400g Lífræn	20170	21224	1054	5.225582548339117
9	Anglamark Makkarónur lífrænar 500g	52941	47977	-4964	-9.376475699363443
32	Anglamark Lakkrísróllur 150g Lífrænar	25058	30973	5915	23.605235852821455
40	Anglamark Ólifur mix 370/215g Lífrænar	27517	28453	936	3.4015335974125085

## Appendix B: Product sales data for Nettó, Grindavík

Grindavik\_unnid (6)

	Vara	Sala 2020 [kr]	Sala 2021 [kr]	Breyting [kr]	Sala Breyting %
77	*Anglamark Dressing þúsund eyja 400g Lífræn	47391	436	-46955	-99.07999409170517
72	*Anglamark Chia fræ 300g Lífræn	17023	1978	-15045	-88.38042648181872
71	Anglamark Hörfræ 400g Lífræn	6733	1423	-5310	-78.86529036090896
76	Anglamark Buglur 400g Lífrænar	1909	529	-1380	-72.28915662650603
67	Anglamark Súkkul.plata 80% Lífrænt	8923	2383	-6540	-73.29373529082147
74	Anglamark Hnetusmjör Creamy 350g Lífrænt	6440	2104	-4336	-67.32919254658385
57	Anglamark Graskersfræ 350gr Lífræn	17979	6101	-11878	-66.06596584904611
35	*Anglamark Pastasósa 420g Lífræn	31388	14155	-17233	-54.903147699757874
54	Anglamark Kjúkl.kraftur fljót 180ml Lífrænn	13150	6983	-6167	-46.89733840304183
68	*Anglamark Hnetumix 5x11g Lífrænt	4859	2698	-2161	-44.47417164025519
62	Anglamark Quinoa hvítt 300g Lífrænt	8721	5821	-2900	-33.25306730879486
8	Anglamark Ávaxtasnakk jarðarb 45g Lífrænt	64027	36247	-27780	-43.38794571040342
69	Anglamark Lasagnesósa Bachamel 500ml Lífræn	2743	2765	22	0.8020415603353991
49	Anglamark Tyttuberjasulta 340g Lífræn	15324	10551	-4773	-31.14722004698512
55	Anglamark Súkkul.hnappar dökkir 100g Lífrænt	7199	4223	-2976	-41.339074871509936
33	Anglamark dressing Hvítlauks 400g Lífræn	34189	23825	-10364	-30.313843633917344
61	Anglamark Nautakraftur fljót 180ml Lífrænn	7796	6138	-1658	-21.267316572601334
53	Anglamark Smjörbaunir 380g	6473	4436	-2037	-31.469179669395952
44	Anglamark Rúsínur 9 lítil box Lífrænar	15630	16112	482	3.0838131797824695
46	Anglamark Tómatasósa 500g Lífræn	12352	8939	-3413	-27.631152849740932
50	Anglamark Borlotti baunir 400g Lífrænar	11147	9942	-1205	-10.810083430519422
9	Anglamark Hunang 425g Lífrænt	125300	112466	-12834	-10.242617717478053
39	Anglamark Súkkul.hnappar hvítir 100g Lífrænt	15775	15839	64	0.40570522979397783
41	Anglamark Hlaup Bangsar 150g Lífrænt	11110	10524	-586	-5.274527452745274
64	Anglamark Kryddkvörn Allrahanda 50g Lífrænt	3497	2690	-807	-23.076923076923077
73	Anglamark Linsubaunir 300g Lífrænar	1608	1835	227	14.116915422885572
70	*Anglamark Kryddkvörn Paprikumix 50g Lífrænt	2050	2023	-27	-1.3170731707317074
17	Anglamark Súkkul.plata karam/sjávarsalt 100g Lífræn	29619	32112	2493	8.416894560923732

34	Anglamark Kryddkvörn Piparmix 50g.Lifr.	17492	18166	674	3.853190029727876
31	Anglamark Hunang squeeze 250g Lífrænt	28277	26266	-2011	-7.111786964670934
11	Anglamark Ávaxtasnakk epla 45g Lífrænt	30647	35050	4403	14.366822201194243
48	Anglamark Raspur 400g Lífrænn	6577	5856	-721	-10.96244488368557
30	Anglamark Rúsinur 250g Lífrænar	19516	24484	4968	25.45603607296577
65	Anglamark 5-kornablanda Lífræn	2695	2496	-199	-7.38404452690167
28	Anglamark Lakkrísruöllur 150g Lífrænar	14033	17635	3602	25.668068125133615
19	Anglamark Súkkul.plata sítr 100g Lífrænt	26006	32395	6389	24.567407521341227
13	Anglamark Grautagrjón 500g Lífræn	50885	61184	10299	20.23975631325538
20	Anglamark Maísmjöl lífrænt 500g	28045	35126	7081	25.2487074344803
27	Anglamark Kryddkvörn Heill Pipar 50g Lífrænt	18784	23265	4481	23.855408858603067
42	Anglamark Lasagna án eggja 500g Lífrænt	10479	12605	2126	20.28819543849604
40	Anglamark Brún hrísgrjón 1kg Lífræn	15562	18686	3124	20.07454054748747
36	Anglamark Kryddkvörn Sjávarsalt jurtum 50g Lífrænt	13911	17918	4007	28.804543167277696
56	*Anglamark Heslihnetur 150g Lífrænar	5269	8246	2977	56.50028468400075
26	Anglamark Pesto Genovese 140g Lífrænt	19869	25024	5155	25.94493935276058
10	Anglamark pasta Fusilli lífrænt 500g	26689	46663	19974	74.83982164936866
45	Anglamark Ólífur mix 370/215g Lífrænar	8953	11531	2578	28.794817379649277
37	Anglamark Súkkul.dökkt appelsínu 100g Lífrænt	10779	13086	2307	21.402727525744503
43	Anglamark Lakkrís finnskur 120g Lífrænn	6009	8792	2783	46.313862539524045
2	Anglamark Spaghetti Heilhv.500g Lífrænt	35688	55190	19502	54.64581932302175
22	Anglamark Pesto Chili Cream 135g Lífrænt	18028	25326	7298	40.48147326381184
51	Anglamark Sólkjarnafræ 375g Lífræn	4840	9043	4203	86.8388429752066
59	Anglamark Bláberjasulta 340g Lífræn	4769	7328	2559	53.6590480184525
3	Anglamark Pastasósa m/jurtum 420g Lífræn	38838	64618	25780	66.37828930428962
38	Anglamark Kakó 125g Lífrænt	9444	13678	4234	44.83269800931809
0	*Anglamark Tómatpaste Túpa Ök 200g Lífrænt	47083	65439	18356	38.98647070067753
14	Anglamark Pastasósa m/grænmeti 420g Lífræn	22836	39672	16836	73.72569626904887
66	Anglamark Brómberjasulta 340g Lífræn	2407	4129	1722	71.54133776485251
4	Anglamark Makkarónur lífrænar 500g	24014	40245	16231	67.58973931873074
75	Anglamark Quinoa svart 300gr Lífrænt	711	1208	497	69.90154711673699
47	Anglamark Lakkrís fylltur 120g Lífrænn	4095	7964	3869	94.48107448107447
25	Anglamark Súkkul.plata bláb 70% Lífrænt	10233	22214	11981	117.08198964135639
29	Anglamark Ólífur grænar 350/200g Lífrænar	11390	23621	12231	107.38366988586479
16	Anglamark Pesto Rosso 140g Lífrænt	18193	37026	18833	103.51783653053373

16	Anglamark Pesto Rosso 140g Lífrænt	18193	37026	18833	103.51783653053373
7	Anglamark Penne Heilhv.lífrænt 500g	17261	37126	19865	115.08603209547535
1	Anglamark Kókosmjólk Lífræn 330ml	33131	65603	32472	98.01092632277927
60	Anglamark Quinoa rautt 300g Lífrænt	2270	6581	4311	189.91189427312776
63	Anglamark Perlubygg Ljóst 500g Lífrænt	1443	2182	739	51.212751212751215
18	Anglamark Dressing hunangs/sinnep 400g Lífræn	17233	52325	35092	203.6325654267974
21	Anglamark Mæjónes 260g Lífrænt	11863	28147	16284	137.26713310292507
12	Anglamark Steiktur Laukur bg Lífrænn	19630	58395	38765	197.47834946510443
58	Anglamark Súkkul.hnappar mjólkur 100g Lífrænt	1744	5250	3506	201.0321100917431
15	Anglamark Tómatar m.kryddi 390g Lífrænir	8813	23364	14551	165.10836264609102
24	Anglamark Salthnetur lífrænar 200g.	4933	11947	7014	142.18528278937765
23	Anglamark Kapers 105/60g Lífrænt	2939	15335	12396	421.7761143246002
32	Anglamark Möndlur 100g Lífrænar	2850	22087	19237	674.9824561403509
52	Anglamark Marsipan 200g Lífrænt	1122	13453	12331	1099.0196078431372
5	Anglamark Tómatar hakkaðir 390g Lífrænir	1491	46029	44538	2987.122736418511