

MASTER'S THESIS

Pilvi Koskinen 2022

LAPPEENRANTA-LAHTI UNIVERSITY OF TECHNOLOGY LUT
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FINNISH NEWSPAPER DISCUSSION ON FOOD PACKAGING

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ABSTRACT

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Keywords: sustainability, sustainability transitions, food packaging, innovations, media

In recent years, the growth of environmental and climate awareness has been strongly reflected in global politics. The pressure to bring food packaging into line with sustainability is a topical matter influencing society. This master's thesis examines the media debate on the sustainability of food packaging in the Finnish news media.

From a sample of three Finnish newspapers classified as high-quality from January 2010 to December 2020, the author of this master's thesis identified news articles on food packaging sustainability based on certain criteria. The analyses looked at the variety of different themes that were addressed in the debate on the sustainability of food packaging in newspapers, and what innovations were proposed for the sustainability transition of food packaging.

There were 216 'food packaging' news articles in these newspapers during this period. These news articles were divided into eleven main themes based on their essential content. The themes identified were business solutions and innovations, plastic separating, collecting, recycling, reusing, and reducing, recycling enthusiasm and problems at the consumer, municipal, and state levels, laws and regulations, marine litter and micro-plastics, food safety, issues with plastic substitutes, energy waste, over-packaging, plastics industry, and food waste. Some of the themes appeared in the data more and some less. Of the news articles, 31% mentioned innovations. The majority of the innovations were considering new innovative materials for replacing fossil-based plastics from food packaging. The three main materials mentioned were bioplastic, cardboard, and wood. Both cardboard and bioplastic were mainly wood-based in the research material. The number of food packaging news articles and proposed innovations both peaked in 2018.

The coverage of food packaging and the different themes in Finnish newspapers from the perspective of sustainability and sustainability transitions increased considerably during the research period. Based on mitigating the effects of climate change while maintaining food security, the choice of food packaging materials will play an increasingly important role in the future.

TIIVISTELMÄ

Lappeenrannan–Lahden teknillinen yliopisto LUT
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Pilvi Koskinen

Ruokapakkauskeskustelu suomalaisissa sanomalehdissä

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Hakusanat: kestävä kehitys, kestävä kehityksen siirtymät, elintarvikepakkaukset, innovaatiot, media

Viime vuosien ympäristö- ja ilmastotietoisuuden kasvu on heijastunut voimakkaasti globaaliin politiikkaan. Elintarvikepakkauksen kestävyysmuutokset ovat ajankohtainen ja yhteiskunnassa laajalti vaikuttava asia. Tässä pro gradu -työssä tarkastellaan elintarvikepakkauksen kestävyyydestä käytävää mediakeskustelua suomalaisessa uutismediassa.

Pro gradu -työn tekijä tunnisti elintarvikepakkauksia koskevia artikkeleita tiettyjen kriteerien perusteella kolmen laadukkaaksi luokitellun suomalaisen sanomalehden otoksesta. Tutkimusjakso oli tammikuusta 2010 joulukuuhun 2020. Analyysissä tarkasteltiin elintarvikepakkauksen kestävyysmuutosten teemoja sekä sitä, millaisia innovaatioita elintarvikepakkauksen kestävyysmuutosten mainittiin näissä sanomalehdissä.

Sanomalehdistä löytyi tarkasteluajanjakson ajalta 216 uutisartikkelia, jotka käsittelivät elintarvikepakkauksia kestävä kehityksen ja kestävyysmuutosten näkökulmasta. Nämä uutisartikkelit jaettiin yhteentoista pääteemaan olennaisen sisällön perusteella. Löydettyjä teemoja olivat liiketoiminnalliset ratkaisut ja innovaatiot, muovien erottelu, keräys, kierrätys, uusiokäyttö ja käytön vähentäminen, innostus ja ongelmat liittyen kierrätykseen, lait ja määräykset, meriroska ja mikromuovit, elintarviketurvallisuus, muovinkorvikkeiden ongelmat, energiajäte ja jätteiden poltto, ylipakkaaminen, yrittäjämuutokset, ja ruokahävikki. Osa teemoista toisia sai laajempaa mediahuomiota. Uutisartikkeleista 31 %:ssa mainittiin innovaatiot. Suurin osa innovaatioista koski uusia materiaaleja fossiilipohjaisen muovin korvaamiseksi elintarvikepakkauksista. Kolme korvaamiseen ehdotettua päämateriaalia olivat biomuovi, kartonki ja puupohjaiset materiaalit. Sekä kartonki että biomuovi olivat tässä aineistossa pääasiassa puupohjaisia. Sekä uutisartikkelien, että ehdotettujen innovaatioiden määrä saavutti huippunsa vuonna 2018.

Elintarvikepakkauksen uutiskattavuus suomalaisissa sanomalehdissä kestävyysajattelun ja kestävyysmuutosten näkökulmasta kasvoi merkittävästi tutkimusjakson aikana. Asiaa koskevat teemat lisääntyivät ja laajenivat tutkimusvuosien aikana. Ilmastomuutoksen vaikutusten lieventämiseen ja elintarviketurvan säilyttämiseen perustuen elintarvikkeiden pakkauksimateriaalien valinnalla on tulevaisuudessa yhä tärkeämpi rooli.

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To quote Jari Sarasvuo: “No loser is needed for someone to win. The definition of a loser is a person who refuses to struggle for his growth and over difficulties. Winning is preparing and, in a test situation, testing how far the work done takes. Winning is a state of basic moral trust. The result is something, it’s a comment. If you outdo yourself, you’re a winner. Failures teach more than gains. The winner is the one who, after falling, gets up and looks for a new way to follow the same path to reach his goal.” (Efter Nio, 2022)

I want to send my biggest thanks to everyone who has helped me achieve this.

Helsinki, February 2022

Pilvi Koskinen

LIST OF ABBREVIATIONS

CMM – Council for Mass Media

CSR – Corporate Social Responsibility

EU – European Union

MNE – Multinational Enterprise

SME – Small and Medium-sized Enterprise

TBL – Triple Bottom Line

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1 INTRODUCTION

1.1 Background of the Study

In recent years, the growth of environmental and climate awareness has been strongly reflected in global politics. The pressure to bring food packaging into line with the sustainable development model began when people worldwide woke up to the littering of the oceans. Much of the ocean's plastic waste comes from non-biodegradable packaging materials. In addition to littering, the use of fossil fuels in the manufacture of plastics, which is accelerating climate change, has put pressure on change. (Viitanen, Kataja, Mutanen, Viitala, Åkerman, Lahtinen et al., 2021)

Recognition that many environmental problems like climate change and biodiversity loss include huge societal challenges, is the underlying motivation for sustainability transition research. Challenges arise from unsustainable consumption and production methods in socio-technical systems such as food industry. The problems cannot be solved by gradual improvements and technological corrections. Structural changes are needed on a fast schedule. (Köhler et al., 2019)

Sustainability transitions can be seen as scientific activities aimed at contributing to and addressing societal challenges (Rauschmayer, Bauler & Schöpke, 2015). Sustainability transitions are long-term, multidimensional, fundamental, and even complex processes of change including both new technologies and changes in existing technologies, markets, governance, practices, and culture, as well as in habits and attitudes (Coenen, Benneworth & Truffer, 2012). Sustainability transitions are considered necessary to adapt societies and economies to sustainable patterns of production and consumption. Through transitions, established socio-technical systems are shifting towards more sustainable production and consumption patterns. (El Bilali, 2019)

1.2 Research Questions

The research questions are:

1. What are the different themes of discussion concerning the sustainability of food packaging in the selected Finnish newspapers?
2. What innovations are offered in the newspaper articles to increase the sustainability of food packaging?

The research material comprises online newspaper articles from 11 years' timeline from three different online newspapers which are Helsingin Sanomat, Kauppalehti and Tekniikka&Talous. Of these, Helsingin Sanomat (HS) represents general media and Kauppalehti (KL) and Tekniikka&Talous (TT) represent business media.

1.3 Theoretical Framework

The theoretical research setting of the work are sustainability transitions and how the media can influence the transition process. The study examines the news media discussion on the sustainability of food packaging. The demands for change to achieve the sustainability goals in the food packaging sector are high. This requires a transition that involves technical and societal changes. I study how the media presents the necessary changes and potential transition paths. The media can drive change because it has the potential to influence all actors in society (Boykoff & Luedecke, 2016; Yadavalli & Jones, 2014). My research seeks to show the priorities of the media debate by opening what is being discussed in the media and what is not so much, and what the consequences may be.

1.4 Definitions of the Key Concepts

Innovation: A business innovation is a new or improved product or business process, or a combination of the two. Business innovation differs significantly from a company's previous products or processes which the company has placed on the market or put into service. (Tilastokeskus, 2021.) Innovation is the introduction of something new' (Nordfors, 2004).

Plastic: The essential component of plastic is a large molecular polymer. The polymer of plastic can be either fully synthetic or natural polymer such as starch or cellulose or a chemically modified natural polymer. (Finnish Plastic Industries Federation, 2020a.) Plastics have traditionally been made from fossil raw materials such as mineral oils (Package-Heroes, 2022). In this work to describe the fully synthetic plastics either the word 'fossil-based plastic' or 'traditional plastic' is used.

Bioplastic: Bioplastics can be roughly divided into two different categories, which are bio-based plastics and biodegradable plastics. Bio-based plastics are made completely or partially from renewable raw materials and biodegradable plastics are materials that are broken down by micro-organisms under predetermined conditions into water, carbon dioxide (or methane) and biomass. (Finnish Plastic Industries Federation, 2020b.) The word bioplastic is used in this work to describe bio-based and biodegradable plastics.

1.5 Delimitations of the Study

I use naturally occurring data, which is considered as the most trustworthy source of data. In these types of data source, people can express matters the way they are socially acceptable, but naturally occurring data does not pretend. Naturally occurring data is data that already exists and simply requires collection and analysis (Lister, Clear, Bouvier, Carter, Eckerdal, Jacková, et al., 2010). This is highly relevant as I aim to find out what the media has "pushed" for as the answers to my research questions. The timeline the data is gathered from is a delimiter. However, a key debate related to food packaging such as climate change and marine litter were key debates during this period. Sources are limited to three outlets, but those three belong to the group of the most reliable Finnish newspapers (Suomen Tietotoimisto, 2021). The research is relevant, as Finland is very focused on the print media (Reunanen et al., 2021). Helsingin Sanomat is the most important and almost the only

important general newspaper (Matikainen, Ojala, Aslama & Jääsaari, 2020) and two financial media, Kauppalehti and Tekniikka&Talous are central in their own segment (Alma Media, 2022a, Alma Media, 2022b). Thus, although the study is limited to these issues, the results of the study can be expected to be a comprehensive representation on the subject.

1.6 Research Methodology

This master's thesis is based on theoretical knowledge and empirical results and is a qualitative study. The empirical part of the study is qualitative secondary data: newspaper articles, from the chosen Finnish online newspapers, from two business media newspapers' and one general media newspaper.

Online newspapers were collected and studied from January 1, 2010, to December 31, 2020. The first phase search words which were used to collect the data, consisted of Finnish words and word combinations which were selected to find data about plastic food packaging lifecycle. Analysis and classification were performed using NVivo which is a market leader software program in qualitative data analysis (Jackson & Bazeley, 2007). The irrelevant articles were removed based on their content. Each news article was read several times at different stages of the research process to ensure relevance. (Rosenlund, Nyblom, Matschke Ekholm & Sörme, 2020)

1.7 Structure of the Master's Thesis

The Figure 1 presents the structure of the master's thesis. The first chapter introduces the study and the second examines the literature and research on sustainability, sustainability transitions, food packaging and media. As this master's thesis examines the Finnish news media, the literature review also presents issues concerning Finland and Finns. The third chapter discusses research methodology and design. The fourth chapter discusses the empirical findings and provides answers to the research questions. The fifth chapter summarises the study with providing conclusions and discussion.

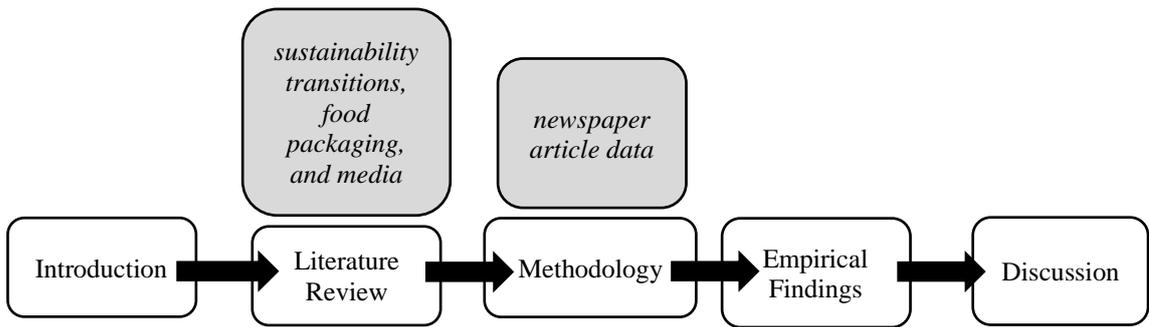


Figure 1 Structure of the master's thesis

2 LITERATURE REVIEW

This chapter opens the literature of the master's thesis. First, a table (Table 1) presents the main literature used in this master's thesis. Then follows a section opening sustainability, sustainable development, and sustainability transitions. The next section is about food packaging. The following section opens media literature, and the last section brings the theory closer to the empirics of this study and thus closer to the Chapter 3. Because the empirical part is considering Finland precisely, are the literature sections opening the matters also from the viewpoint of Finland.

2.1 The Main Literature Sources

The Table 1 below present the main literature used in this master's thesis. The main literature consists mainly of peer-reviewed articles, also a scientific report is used. The Key Themes column in the table describes the themes relevant to this master's thesis. The literature source may also include other key themes that are not covered in this master's thesis. The literature is discussing sustainability, sustainable development, sustainability transitions, food packaging, media, and environment.

Table 1 The main literature used in this master's thesis

Year	Author(s)	Topic	Key Themes
2010	Hoffhaus and Lubjuhn	The aim of the authors' research was to create a framework for concrete actions and project ideas so that public bodies can promote the effectiveness of sustainable development in various forms of media. The results of the study were presented and discussed throughout the day in a workshop. The aim of the workshop was to involve media experts, journalists, and researchers in evaluating the results of the study. Feedback was included in the research report. (Hoffhaus & Lubjuhn, 2010)	Sustainable development, Media
2010	Bondafelli	The author says that despite the importance of sustainability issues in the media, environmental and risk communication is still a fragmented and somewhat marginal research topic. The theoretical part of the article addresses relevant research questions and important underlying theoretical perspectives,	Sustainability, Environment, Media

		such as news values, cycles of attention to the topic, media framing or delusion, and different approaches to media influence. (Bondafelli, 2010)	
2016	Boykoff and Luedecke	The article is about elite news media coverage. The authors say the media has a strong influence on political decision-making, attitudes, perspectives, intentions, and behaviour change, but identifying these connections can be challenging (Boykoff & Luedecke, 2016).	Media
2017	Luedecke and Boykoff	In the article, the authors discuss on media communication on environmental issues, media coverage and journalistic norms, values and ideological implications for media communications, and the media and environmental cultural policy (Luedecke and Boykoff, 2017).	Media, Environment
2017	Licciardello	Licciardello aimed to examine the actual relative impact of packaging in relation to the total environmental load of food production. He concluded that consumers generally see packaging as unnecessary and, at worst, a serious waste of resources and a threat to the environment and this was due to a misunderstanding. He wrote packaging researchers need to return the packaging image to public opinion, highlighting its positive effects and enormous potential. Licciardello concluded that the environmental issues of packaging should not be generalized, and it would be more appropriate to focus on the packaging-product system instead of packaging alone. (Licciardello, 2017)	Food packaging, Sustainability, Environment
2019	Köhler et al.	Köhler et al. provide an extensive overview and an updated field research program categorized under nine main themes. Their review shows that the potential for research on transition in sustainable development has expanded and links with established disciplines have been strengthened. They say the biggest challenges to sustainable development remain unresolved. This requires constant effort and accelerating continuous change. It is possible that transition research can play a key role in this, as it creates new perspectives, approaches and understanding and helps to move society towards sustainable development. (Köhler et al., 2019)	Sustainable development, Sustainability transitions
2021	Otto, Strenger, Maier-Nöth and Schmid	Otto et al. provided an overview of European consumers' perceptions of current research and how this correlates with the environmental impact of packaged foods and unpackaged foods.	Food packaging,

		Consumers evaluate packaging materials based on the circular economy, natural-looking material, and design. Their findings show that consumers evaluate food packaging based on affective emotions rather than cognitive reasoning. Consumers have little knowledge of the practical implementation of recyclability, biodegradability, and reusability, as well as other environmental impacts. As a result, consumers' purchasing behaviour is in most cases less environmentally sustainable than planned. (Otto et al., 2021)	Sustainability, Environment
2021	Sundqvist-Andberg and Åkerman	Sundqvist-Andberg and Åkerman investigated reasons for the difficulties associated with the durability of plastic food packaging. Their analysis shows that while the circular economy covers the entire life cycle of the food package, the beginning and end of the life cycle have received the most attention and only a limited number of policy measures focus on the consumption phase. Finally, they argue that the different functions of plastic food packaging need to be better recognized in environmental policymaking. (Sundqvist-Andberg & Åkerman, 2021)	Food packaging, Sustainability
2021	Keränen, Komulainen, Lehtimäki and Ulkuniemi	The authors are considering food packaging innovations and bring sustainability transition theory into the conversation. Reasons for the need of sustainable food packaging are discussed and the importance of innovation in this field is brought up. (Keränen et al., 2021)	Sustainability transitions, Food packaging
2021	Viitanen, Kataja, Mutanen, Viitala, Åkerman, Lahtinen et al.	The authors talk about the era of change in food packaging and many aspects of sustainability transition in this matter. The role and opportunities of the Finnish forest industry are under discussion. (Viitanen et al., 2021)	Sustainability transitions, Food packaging

2.2 Sustainability, Sustainable Development, and Sustainability Transitions

“Meeting fundamental human needs while preserving the life-support system of planet Earth is the essence of sustainable development” (Kates et al., 2001)

Sustainability science was introduced at the turn of the 21st century in response to the scientific world to understand and address the problems of sustainability. Sustainability

science has established itself as a separate subject in many universities around the world. Robert Kates et al. (2001) wrote an article in *Science* which is considered as the cornerstone of sustainability science. The key message of the article was that complex and systemic sustainability problems need their own discipline. This discipline would increase understanding of the intricate interactions between man and nature and seek to make them more sustainable. In Finland, the concept of sustainability science and the content of the debate are still little known, but there is a lively debate about sustainability science globally. (Soini, 2017)

Sustainability literature seeks to provide a better understanding of the relationship between business and the environment. Sustainability issues must be seen as systemic challenges where business actors, government, and civil society each have different position. Business actors continue to focus more on reducing unsustainable business-level behaviour than on increasing system resilience by making radical changes between actors and levels. (Loorbach, van Bakel, Whiteman & Rotmans, 2010.) Triple bottom line (TBL) is often used to describe business sustainability. It is a business concept which defines sustainability from a threefold perspective: through the ecological, economic, and social dimensions. TBL is suggesting companies to focus on all the three dimensions in an organization's performance instead of focusing only on financial performance. (Carter & Rogers 2008; Muruli, 2015)

In recent years, sustainability research has expanded rapidly, diversified between topics and geographical applications, and deepened in terms of theories and methods. Underlying the study of sustainability transitions is the recognition that many environmental problems, such as climate change and biodiversity loss, present enormous societal challenges. These challenges stem from unsustainable consumption and production patterns in socio-technical systems such as the food packaging industry. Central aim of transition research is to conceptualize and explain how radical change can take place so that social functions are fulfilled. The field of sustainability transitions has developed profusely becoming a productive, collective, and highly cumulative endeavour and despite its broad approach, the field is aroused with enthusiasm and creativity. (Köhler et al., 2019)

Loorbach, Frantzeskaki and Avelino (2017) write that the term "transition" refers to a nonlinear change from one dynamic equilibrium to another. It has been widely used in disciplines such as demography (demographic transition), ecology (ecosystem transitions),

and psychology (developmental transitions). Loorbach et al. continue with saying that the term "sustainability transition" is increasingly used to refer to major societal changes. In short, sustainability transitions are large-scale disruptive changes in social systems that have manifested themselves over many decades. (Loorbach et al., 2017)

Theories of sustainable transitions seek to explain the processes, pathways, and actors involved in changes in technologies and practices. The amount of research that develops theoretical understanding on sustainability transitions is constantly increasing, but there is still insufficient documented information on how theories are used and applied by the practitioners themselves. (Bush, Aye, Hes & Murfitt, 2018)

Transitions in society inherently become political processes as different groups and individuals disagree about different directions of transitions and appropriate ways to sustain such processes, and because transitions often lead to winners and losers. Transitions can threaten established industries. For this reason, the established industries use power to protect themselves and oppose transformative innovations. At the same time, new entrants or players flagging alternative socio-technical changes are lobbying for public support. In the field of transition research, issues of transition policy and power are receiving increasing attention. The transfer of power and politics has become a widely recognized theme in the study of the sustainability transitions. (Köhler et al., 2019)

Although it is known that processes like sustainability transitions are slow and progressing over decades, the nature of sustainability problems craves for immediate action. The situation is exacerbated by the short-term concentration of citizens and the need for business actors to ensure short-term survival, making it difficult for decision-makers to achieve the ambitious goals of sustainable development programs. Addressing these issues is crucial to meeting the sustainability challenges of the 21st century. (Farla, Markard, Raven & Coenen, 2012.) Transitions are slowed down by that the development of radical practices and innovations is largely long-term and gradually builds on previous small-scale application developments before being widespread (Köhler et al., 2019).

For the transition from existing unsustainable practices, technologies and solutions to new sustainable ones, the former must be phased out. The solutions created in parallel to the emergence of narrow technologies and practices must be shaken. For instance, if government

actors find solutions that keep the current system largely unchanged, with little change in existing technologies, business models or practices, there will be no socio-economic transition. (Kelemen, 2020.) It must be borne in mind that some technological solutions have ultimately only strengthened the technical and institutional impasse by supporting current failures (Farla et al., 2012).

2.3 Sustainability of Food Packaging

The existing literature discusses food packaging as a crucial factor of the current food system. A modern society with geographical spread and global value chains would not function without food packaging (Sundqvist-Andberg & Åkerman, 2021). The main purpose of food packaging is to protect its contents (Viitanen et al., 2021). Protecting the content ensures the quality of food and maintains food safety throughout the supply chain (Otto, Strenger, Maier-Nöth & Schmid, 2021). Food packaging increases convenience and communication and prolongs shelf life of groceries by preventing adverse factors or conditions such as degradable micro-organisms, chemical contaminants, oxygen, moisture, light, and external force (Sundqvist-Andberg & Åkerman, 2021; Rhim, Park & Ha, 2013).

Lack of food packaging tends to increase food waste. Reason is that without packaging the food is not protected from the external and internal reasons that lead to food waste. External causes can be, for example, damage to the product during transport, and internal causes can be exemplified by that food is spoiled more quickly without the surrounding protective material. Even if the reduction in food waste is small, it is often advisable to use packaging materials for foods that have a high environmental impact. (Otto et al., 2021)

On the other hand, food packaging is one reason for over-consuming natural resources, trashing and marine plastic litter problem as well as the micro-plastics all over (Licciardello, 2017). Packaging generally covers a significant proportion of municipal solid waste. At European level, about 31% of municipal solid waste is packaging waste. (Boesen, Bey & Niero, 2018). In the circumstances of the present age, food production is one of the most debated arguments (Parisi, Barone & Caruso, 2015).

It is estimated that one third of food produced worldwide is either lost or wasted before and after it reaches the consumer. Food waste has become a common concern that requires urgent preventive action throughout the food supply chain. The generation of food waste is prevented and reduced by packaging food. Therefore, innovations in packaging materials and manufacturing processes to better preserve the quality and freshness of food during its distribution and storage, are important. Due to environmental problems related to packaging, the demand for more sustainable packaging innovations has increased. (Keränen et al., 2021.) When measuring the sustainability of food production, the role of food packaging is controversial. There is a general perception that packaging is responsible for the high environmental impact, although scientific evidence speaks to the benefits of packaging in reducing food waste. (Licciardello, 2017.) The material, shape and concepts of packaging vary greatly. For this reason, the environmental impact of packaging cannot be bundled into one category. (Otto et al., 2021)

There are several technical and practical requirements for food packaging. Examples of the properties required of different food packaging are grease, gas, and heat resistance, freezability, airtightness and moisture properties. In addition, packaging materials are required to have statutory product information. When considering a product for marketing and sales, it is essential that the design and shelf visibility of the food packaging are in order. In addition, recyclability, biodegradability and, more generally, the environmental footprint are increasingly important properties for packaging. As part of the future, food packaging will see various smart packaging that talks about the freshness of the product or the unbroken nature of the cold chain, as well as edible packaging. (Viitanen et al., 2021)

Since the 1960's the use of plastic as food packaging material has steadily increased because it has been inexpensive and has been able to reduce the weight of packaging. The use of plastic, especially in combination with vacuum packaging, has also significantly extended the shelf life of food and reduced food waste. (Viitanen et al., 2021) Plastics are the most widely used materials in the manufacture of food packaging and no substitute with similar properties has yet been found. The advantages of plastics as packaging material when comparing to other materials are, for instance, the following:

- low production costs,
- versatility,
- flexibility,
- light weight,
- transparency,
- heat seal ability and
- protective performance. (Evans et al., 2020; Licciardello, 2017)

In recent years demand for more sustainable packaging innovations has increased due to environmental issues related to packaging (Keränen et al., 2021). As consumers become more environmentally conscious, reducing the use of traditional plastics, and replacing them with other materials has become an increasingly important part of food branding. Thus, especially in the European Union (EU), a market-driven shift from fossil plastics to more environmentally friendly alternatives are also expected due to consumer demands. In the EU, change is also strongly influenced by current and future policy decisions, including requirements for plastic recycling and restrictions on certain disposable plastic products. (Viitanen et al., 2021)

Sustainable packaging must be effective in performing its core functions which are:

1. protection of the content
2. efficient use of only the resources that are necessary
3. safety from the point of view of the environment and human health, and
4. the requirement for the food packaging circularity in meaning that at least reusability and recyclability of the packaging need to be solved already in the producing phase. (Pauer, Wohner, Heinrich & Tacker, 2019)

Bioplastics are a potential innovation that can contribute to sustainable development in food packaging. Bioplastics-type innovations have been considered in the literature as sustainable innovations that include new or improved processes, products, services, organizational and marketing methods that significantly reduce negative or improve positive environmental, social, and economic impacts. The challenge for sustainable innovation is to combine ecological and social aspects alongside economic ones. (Keränen et al., 2021.) The use of bio-based plastic packaging materials will help to create more sustainable food packaging materials compared to traditional plastic packaging materials. Although bio-based plastic packaging materials have a lower climate impact, there are other environmental impacts, such as eutrophication of water bodies, water and pesticide use levels, and impacts on biodiversity. These reasons speak in favour of non-bio-based materials, and this must also be considered when talking about different material options. Recycling packaging significantly reduces its environmental and climate impact. (Mendes & Pedersen, 2021)

When considering fossil plastic substitutes in food packaging, it should be borne in mind that if the substitute product is not durable and breaks, it will no longer protect the product, the product will be spoiled, and thus food waste will increase. This, in turn, is not cost-effective and environmentally friendly. When designing a product-packaging combination and calculating its environmental impact, in addition to the packaging material and its quantity, the characteristics of the product to be packaged and the entire production chain associated with that combination should always be considered. (Viitanen et al., 2021)

In industries like food packaging, the transition to sustainable solutions requires the dismantling of existing industry systems that support the use of legacy technologies and prevent the transition to more sustainable solutions. Such systems are socio-technical systems consisting of technologies, market practices, cultural meanings, infrastructures, policies, and industrial structures that provide a framework for the behaviour of actors in the sector. (Keränen et al., 2021)

El Bilali et al. (2019) say that in the scientific literature, the separation of food safety from food sustainability leads to the interruption of the ongoing debate about the sustainability transitions that are necessary to solve the problems caused by conventional food systems. In addition to the triple bottom-line (TBL: ecological, economic, and social), health should be

added fourth to this group when the debate is considering food packaging. Food sustainability and food security should be viewed in parallel in this conversation. (El Bilali et al., 2019)

Finland's strengths in the food packaging industry are high-tech know-how, the transparency of the food chain and the use of citizens and information technology in innovation processes. When talking about future development goals, VTT's Finnish food research and innovation strategy 2021–2035 research can be used as a source. VTT's research mentions a resource-efficient and waste-free food system as one of its missions with concentrating to e.g., food packaging and the logistics chain. According to the study, efforts must be made to create new innovations for the recovery of waste and by-products. Bio-based smart food packaging using materials derived from agricultural and industrial by-products needs to be further developed. Attention needs to be paid to consumer information on food packaging so that consumers are better able to make sustainable choices. Recycling and delivery logistics solutions for packaging materials must be developed considering the possibilities offered by digital systems. (Sözer, Nordlund, Poutanen, Åkerman, Heinonen, Sandell, et al., 2021)

2.4 Sustainability in Media

The impact of media on people is unquestionable in societies (Hoffhaus & Lubjuhn, 2010)

Today's society is hard to imagine without the media. The purposes, means, and motives of the media are many, such as informing, entertaining, helping people form opinions, and supporting them to stay in those opinions. To put it simply, the most important role of the media is to influence. The media have supplanted the traditional roles and functions of many educational, religious, and political institutions in modern society. (Hoffhaus & Lubjuhn, 2010.) The media as an institution traditionally faces different societal expectations. The media is often seen to play a key role in the functioning of democracy in two ways. It acts as a mediator between decision-making systems and citizens, and as a guardian of the exercise of power. The role of the media is, inter alia, to provide information independent of those in power, to promote social debate and to educate citizens. (Matikainen et al., 2020)

News media has a strong influence on political decision-making, attitudes, perspectives, intentions, and behavioural changes. For a consumer it can be challenging to locate these

connections. (Boykoff & Luedecke, 2016.) Print media is one of the most popular and effective forms of mass communication. Its role is important in transforming and educating society. The print media influence and shape readers' perceptions through in-depth news and analysis. The advantage of read and especially print media is that it affects the reader's mind for a longer period through deeper coverage and research than other media types. (Ferdous & Khatun, 2020.) In Finland, the position of traditional printed news media is still strong, despite the strengthening of online media, and online news has therefore not replaced traditional news channels but has come alongside them. (Reunanen, Alanne, Rätty, Nousuniemi, Harakka, Nuorgam, et al., 2021)

Already in the 1970s, environmental issues began to be important in the mass media. Still, the concept of media and environment has been under only a marginal research area and the inputs of communication sciences have been fragmented until these days. Looking at how the media selects their stories from an unlimited number of events and how the stories end up to journalists comes to the key question of communication research. Media does not only mirror the real world one at a time, but instead of that, it mirrors the stories from its own media-specific logic. Because sustainability can be considered as complex and abstract concept, issues to do with it, like man-made climate change are entering the media agenda as emotionalized and scandalized matters. (Bondafelli, 2010)

Media have a key role to play in promoting comprehensive change in society, in line with the overall concept of sustainability. People can be reached through sustainable messages through the effective use of media formats. People can learn from the media or, at best, change their attitudes and behaviour, as several studies have shown (cf. Europabarometer 2001, Porter Novelli 2002 and 2005, Kaiser Family Foundation 2008, Reusswig et al. 2004). (Hoffhaus & Lubjuhn, 2010)

Extensive social, political, and economic factors influence everyday individual journalistic decisions, such as how a story is targeted or contextualized quickly over time because of the deadlines of the journalists. These reasons intersect processes, such as journalistic norms and values and that effects to the final news content. In addition, the interdependence of professional journalism, the path between journalistic norms and values, and power relations affects to the final news stories. (Boykoff & Luedecke, 2016)

Hoffhaus and Lubjuhn (2010) clarify the issue of sustainable development as a topic that refers to a complex, ambiguous matter that ultimately has an impact on changes in societal values and behaviour. When reporting on responsibility and sustainability in the media, professionals usually describe individual issues, facts and figures and reduce the complexity of the topic with stereotypes that run the risk of dealing only superficially. Media professionals do not always have enough time to deal with things in depth because of their deadlines and in addition describing complex processes is challenging for many journalists. The professional qualifications of journalists, producers and PR professionals have not traditionally included responsibility and sustainability issues and the integration of these themes into the media. Therefore, it can be said that in some cases, media makes quick headlines as well as is simplifying things for the reader. (Hoffhaus & Lubjuhn, 2010)

When sustainability issues become visible in the media, they can only succeed in reaching media producers and consumers by following the logic of the media (e.g., short, fast-paced, and attractive formats). Currently, there are many old and new media communication tools, including those that influence media users, encouraging them to promote “greener” behaviour. For example, these new formats provide information on how you can personally promote a more sustainable lifestyle. However, media options for well-communicated sustainable living and consumption material are constantly growing on all media platforms, especially social media platforms. (Hoffhaus & Lubjuhn, 2010)

Climate change is being used as a so-called “door opener” for other sustainability issues in the mainstream media, where the trend of sustainable adoption has emerged in recent years. One feature of media sustainability communication is the effort to expand the coverage of sustainability issues addressed by presenting individual responsibility issues. (Hoffhaus & Lubjuhn, 2010)

Cahan, Chen, Chen, and Nguyen (2015) conclude that the evidence supports a causal link between CSR performance and media image, suggesting that it is possible that the media favour’s responsible businesses. Although, it is possible that companies do not actively manage CSR to improve their media image; instead, they may invest in CSR for other

reasons like altruism and favourable media coverage may be an attractive side benefit. (Cahan, Chen, Chen & Nguyen, 2015)

2.4.1 Finns as Media Consumers

The Finnish population is well-educated, literate, and consumes plenty of news media in international comparison. According to Statistics Finland's degree register, by the end of 2017, 72 per cent of those aged 15 and over had completed a degree after primary school and 31 per cent of those over 15 had completed a university degree. (Kestilä & Martelin, 2019.) Public confidence in national institutions such as parliament, politicians, political parties, the judiciary, and the police has been stronger in Finland than in Southern Europe, not to mention eastern Central Europe. According to the 2019 Science Barometer, the level of education in Finland is directly proportional to trust in science. (Jallinoja & Väliverronen, 2021)

The Reuters Institute's Digital News Report Finland's 2021 country report tells that, 91% of Finns read newspapers regularly and the readership of online magazines has been expanding all the time. Also, Finns trust the news more generally than citizens of any other country participating in the survey. The results of the institute's research show that this has been the case since 2015. According to a Eurobarometer survey conducted in summer 2020, 71% of Finns trust the media. The figure is the highest in the European Union. (Reunanen et al., 2021.) According to a research report from the University of Helsinki (2020), Helsingin Sanomat is one of the most trusted news brands in Finland (Matikainen et al., 2020). Sanoma's Annual Report 2020 shows that the number of subscribers to Helsingin Sanomat has grown for the fourth year in a row (Reunanen et al., 2021).

Finns' great trust in the media has been explained, among other things, by the relatively strong professional culture of the journalism community, which is supported by the Council for Mass Media (CMM) in Finland. Confidence in the news one follows oneself is typically greater than trust in the news in general. According to the latest survey conducted in Finland, trust in news of interest to oneself is 71% and trust in news in general is 63%. These figures are significantly higher than in any other survey country. In addition, 67% of Finns are interested in the news. The most interested in the news, according to this survey, are highly educated, high-income people over the age of 35. (Reunanen et al., 2021)

2.4.2 Media Responsibility in Finland

The media sector is a constantly evolving industry, and its output is more visible to a wider audience than most other industries. Content produced by the media is required to be error-free and easy to follow by readers and other stakeholders. However, the flawlessness of the content is only a small part of the responsibility that affects the entire media industry. The Media Research Foundation (2021) has defined “responsibility” as the way in which a media company and its staff operate in a socially, economically, ecologically, and culturally responsible manner. In addition, with the strong digitalization of the industry, technological ethics and responsibility are also at the centre of the debate. However, the viability of the media must be maintained, even if the focus is on developing responsibility and sustainability. (Huhtala, Lonka, Paakkola, Salminen, Sunila, Tikkanen, Vaniala & Vittaniemi, 2021)

Responsible use of information and technology is becoming a significant factor from the perspective of the media industry. An important point in this media responsibility debate is the competitive advantage that responsibility brings. Data protection and privacy already pose serious financial risks to media companies. The media industry is at the heart of the technological change. Digitalization of the media industry will continue and accelerate in the future. Companies need to be able to innovate and keep up with other innovations like the growth of the mobile market, the sharing economy, data collection and exploitation. Finland is one of the most networked countries in the world, and the use of the Internet has grown steadily in the 21st century. (Huhtala et al., 2021)

The recent Finnish research project on the state of Finnish media “The responsible and profitable media sector 2021” (VAKA 2021), used as a source in this section, has four main research results. Those results are presented and opened in a little more detail below in the Table 2. The findings are highlighting the meaning of consumers. (Huhtala et al., 2021)

Table 2 The four main findings of the research project VAKA 2021

<p>1) The Finnish media industry must expand its own sense of responsibility. Media companies look at responsibility through the traditional triangle (TBL), but consumers' perception of responsibility is becoming increasingly diverse. Media companies should see consumer protection as an important part of their responsibility for information and technology.</p>
<p>2) From the point of view of competitive advantage, responsibility is not only tactical but also strategic. Currently, the media industry is divided into two actors that deal with accountability at either the tactical or strategic level. A truly strategic level requires that responsibility goals be tied to rewarding management and the systematic measurement of responsibility.</p>
<p>3) Responsibility as a competitive advantage requires identifying the peaks of added value and prioritizing development targets. Competitive advantage does not only come from compliance with guidelines and minimum reporting. The Finnish media industry must make challenging resource choices. At present, significant added value for consumers lies in transparent communication on political status and contacts, as well as clarity in data protection practices.</p>
<p>4) The media industry's own perception of the state of its responsibility differs significantly from that of media consumers regarding media responsibility. Media companies should look critically at their current performance. Media companies give themselves a good rating for their social and ethical responsibility, for example, but only a third of consumers agree. Either media companies' view of their own operations is exaggerated or there is room for improvement in CSR communication.</p>

Responsibility in the media sector is divided into journalistic and business responsibility, which, according to studies, is how it should be seen. Also, according to studies, the main reasons for media responsibility are financial incentive and normative values, so to speak, "doing the right thing." Studies have found a small positive relationship between corporate responsibility measurements and financial performance. (Huhtala et al., 2021)

Both Alma Media Corporation and Sanoma Corporation are included in the VAKA 2021 survey, which means that all data sources (HS, T&T and KL) are included in this survey. The study revealed that Alma Media comprehensively reports on compliance with the journalist's instructions in its 2020 corporate responsibility report and states that it follows decisions on ethics extensively. The Finnish media involved in the comparison communicate well about freedom of expression. This may be due to e.g., that in Finland the Council for Mass Media has defined the principles of freedom of expression. In its corporate responsibility report, Alma Media states its commitment to the guidelines of the Public Speech Council and the Journalist's instructions. Alma Media also talks about its commitment to transparency. When the reader has a clear picture of the background to the

emergence of a news article, he or she can more critically assess the correctness of the story, as the possibility of mistakes exists, especially in the age of digital media. Alma Media communicates comprehensively its goals to promote and engage in responsible marketing. For example, Alma Media states that it will strengthen its technical capabilities and the skills of its personnel so that advertising fraud or against good marketing practices are not published on its online and mobile services. In the data protection section, Sanoma states that the user has the right to receive information about a high-security breach. (Huhtala et al., 2021)

Media consumption choices are strongly influenced by the media's commitment to tackling the climate crisis. Nearly half (48%) of consumers consider it crucial. A small majority, 55%, of media companies operating in Finland see that handling environmental issues in their own content generates great added value for consumers. (Huhtala et al., 2021)

In general, Finnish media companies have roughly similar attitude towards responsibility as large companies or other multinational enterprises (MNEs) operating in other industries in Finland. Most feel that the company has a significant role to play in solving social and environmental problems and those actions related to these themes increasingly appear to be factors of competition or differentiation. 14% of media companies say it is not their job to deal with social problems. A slightly larger part, 18% of Finnish companies say the same. (Huhtala et al., 2021)

2.5 Sustainability Transition of Food Packaging and the News Media

Food packaging is under pressure to change as a part of sustainability transition of food industry. Although the plastic value network for food packaging is under increasing pressure to introduce new sustainable innovations, their dissemination is problematic due to well-established systems in the sector. New bioplastic packaging materials create pressure and opportunities for the existing business network involved in the production of conventional food-grade plastic packaging. The necessary changes to the existing business network can materialize if the new packaging materials can bring improvements to existing solutions from the perspective of manufacturers and end-users. (Keränen et al. 2021)

Changes at different actor levels influence each other. Politicians and consumers can force and encourage companies to make sustainable decisions; while companies are actors in the value network, the macro-level pressure changes also at the network level. When different actors and their interests collide, winning solutions for all parties are rare, at least in the short term. But the broader pressure resistance experienced by all actors can serve as a holistic element. The food packaging industry brings together operators in the plastics industry, the packaging industry, the food industry, retail, public sector, and waste management. For packages with recycling flows are well organized and efficient, changes in packaging materials may require changes in the material cycle and thus changes in technologies of many actors. (Keränen et al. 2021)

It is indispensable to understand what themes are being discussed in the media, because the media influence the matters that are discussed and thus influence consumers' purchasing decisions and decision-makers. The media adheres to the ethical rules of fair, accurate and objective journalistic work. These codes, called professional standards, see journalism as a platform for open and transparent discussion between different sectors of society. In this context, the media strives for independence, truth, and accuracy of coverage. (Luedecke & Boykoff, 2017.) Consumers often rely on the media to obtain relevant information, and that is how the media can influence on their attitudes, purchasing decisions and opinions (Yadavalli & Jones, 2014).

Climate change is a highly politicized issue in the media. Its coverage illustrates how much influence political groups have in influencing the public debate on climate change. Recent research on the global visibility of climate change in the media, as well as on climate discourse and the links between media, politics, and public opinion, suggests that media agendas are in line with public goals on the perception and policy implications of climate change. Climate change media visibility is not just a collection of news articles produced by journalists. Rather, media visibility implies key frameworks derived from the complex and non-linear relationships between researchers, policy makers, and the public, often mediated by news articles. (Luedecke & Boykoff, 2017.) According to surveys, more than half of media users consider it important that the media they use addresses environmental issues in their content (Huhtala et al., 2021).

Food packaging sustainability transition is a part of the media discussion on climate change. The well-educated Finnish population (Kestilä & Martelin, 2019) has the highest confidence in the media among the entire European Union member states (Reunanen et al., 2021), and are thus a significant readership for learning, embracing, and implementing various themes and issues related to the sustainability transition of food packaging.

3 METHODOLOGY

This chapter provides an overview of the research methods and design. First research design is talked about continuing with opening the research approach. After that follows data collection and data analysis. They are presented with opening the process and highlighting observations and with using some charts and tables and telling how the research perspective was narrowed. This chapter ends with opening the reliability of the research.

3.1 Research Design

The purpose of this work is to open an understanding of what kind of themes can be found from Finnish newspaper discussion on food packaging and what kind of innovations the Finnish newspaper media presents as solutions for replacing plastic food packaging. This is a qualitative study. The data used is secondary data and part of a larger data base. The data has been collected from Finnish online newspapers for a period of 11 years (1.1.2010-31.12.2020). It is online newspaper articles. The data sources can all be called as quality newspapers. The study aims to find answers to the research questions concerning the themes and innovations presented in the newspaper articles.

The Finnish newspapers used as a source of the data:

- Kauppalehti (KL) is Finnish financial newspaper providing news mostly about business and economy. Kauppalehti is published five times a week. (Alma Media, 2022b)
- Tekniikka&Talous (T&T) is a Finnish business newspaper concentrating especially on innovation and technology. The printed newspaper is published 41 times a year but, on their webpage, new content is published every day. (Alma Media, 2022a)
- Helsingin Sanomat (HS) is Finland's most read daily newspaper with 339 437 total circulations, and it is published every day (Media Audit Finland, 2020).

3.2 Theory-affiliated Approach

Research is theory-based when the analysis of research data is based on an existing theory or model. When conducting data-driven research, the focus of the research is on the data, which means that the units of analysis are not predetermined, and the theory is built as the starting point for the data. In the middle of theory-based and data-driven research, one can think of theory-affiliated research, in which the analysis of the data is not directly based on theory, but the connections to it are noticeable. In this case, explanations or confirmation of the theory are sought to support the observations of the material. (Saaranen-Kauppinen, & Puusniekka, 2006)

The theory-affiliated approach to data can be called as abductive reasoning (Saaranen-Kauppinen, & Puusniekka, 2006). In abductive reasoning, the aim is to explain the phenomenon by deriving the observed consequences from the possible causes of the phenomenon and moving back and forth to get the best possible explanation. The main assumption is obvious, but a small premise and therefore a conclusion is only probable. Basically, it involves drawing a conclusion from information that is known. (Jensen, 2008; Merriam-Webster, 2021)

The Figure 2 shows the theory-affiliated abductive research path of this master's thesis. The process started with the data. At the beginning were the original search words used when collecting news media articles from the sources, and the first pressures found in the data at the beginning of the coding. Then came the first time that possible theories were considered. Stakeholder theory and institutional theory were considered at the outset but were quickly abandoned. CSR (Corporate Social Responsibility), sustainability and media theories were then considered. Then it was time to go back to the data and build the body of the thesis. On the theoretical side, it became clear that CSR theory did not match the data well enough. The role of sustainability was strengthened with sustainability transitions theories. The next empirical step was to discard the side-lines to narrow the perspective of the study. After the completion of the empirical main structure, food packaging literature was added to the theoretical content according to the final direction of the study. Several steps followed between the theory and the empirical part. In the final stage, the theoretical basis was expanded and refined. Finally, the empirical conclusions from the data were presented and the intersections between empiricism and theory were discussed.

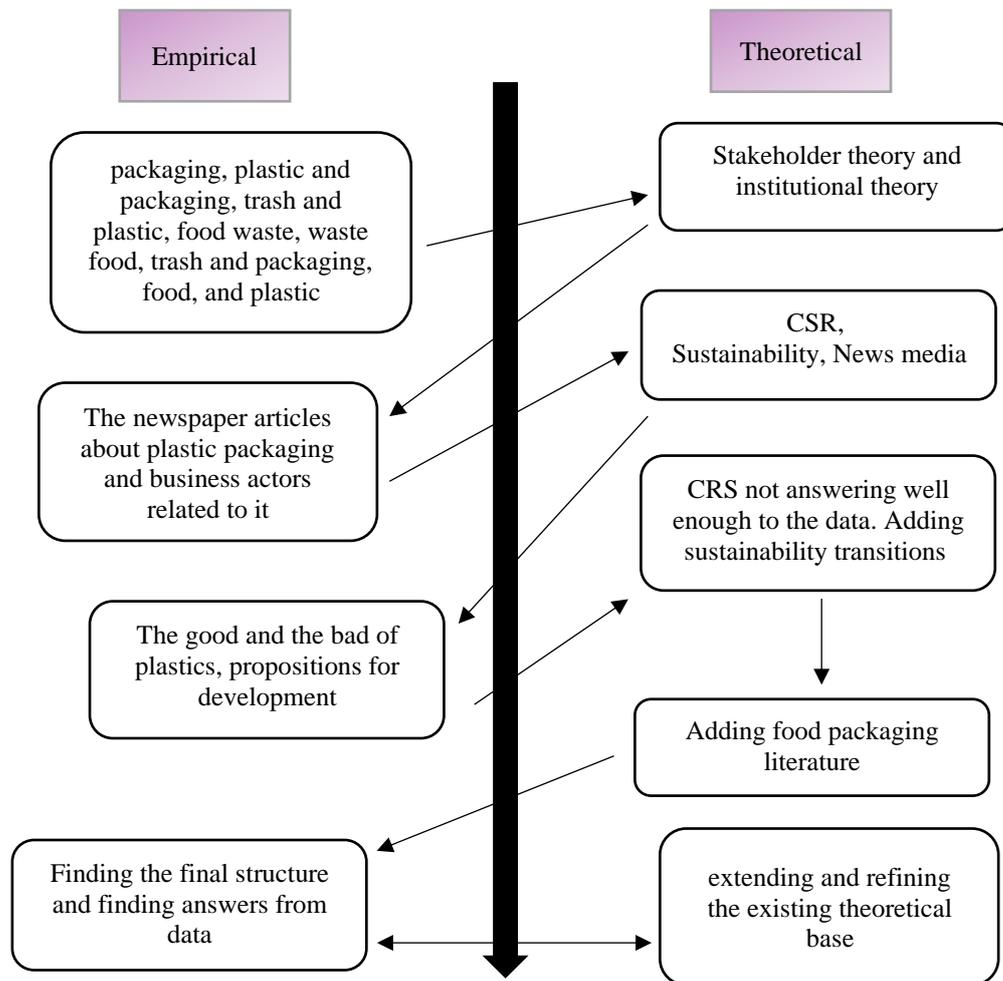


Figure 2 The theory-affiliated abductive research path of this master's thesis.

3.3 Data Collection

Secondary newspaper article data are used in the empirical analysis. The secondary data were collected from the digital websites of the selected newspapers. Digital newspaper articles were collected and studied from January 1, 2010, to December 31, 2020, which makes a longitudinal perspective to the data as it has been collected over a relatively long period of time (11 years). The first phase search words which were used to collect the data, consisted of Finnish words and word combinations which were selected to find data about plastic food packaging lifecycle and matters related to it. Analysis and classification were performed using NVivo. Irrelevant articles were removed based on their content. Each news article has been read several times at different stages of the research process to ensure relevance. (Rosenlund et al., 2020)

The research began from the data to the theory, and then continued with back-and-forth movement between the empirical data and the theoretical literature. First step was collecting the data from three different Finnish newspapers; Helsingin Sanomat (HS) which is aimed at general audience and Kauppalehti (KL) and Tekniikka&Talous (T&T) which are aimed at business audience. The content was found with using certain seven Finnish search words and search word combinations. The seven search words and search word combinations were:

- pakkaus
- muovi ja pakkaus
- roska ja muovi
- roska ja pakkaus
- ruoka ja muovi
- ruokahävikki
- ruokajäte

The data which is here talked as news articles included mainly news, but also some readers opinions, columns, editorials, comments, and a few blogs, question & answer columns, and obituaries. There were 6 222 news articles after the gathering process and the ones considered relevant based on their content (597) were downloaded to NVivo for coding and analysing.

An Excel table with multiple columns for defining was made of all the 6 222 news articles. The columns were made for structuring. A column included the link to the news article, and another was whether the news article in question was relevant in the food packaging debate. The decision to include and exclude certain news articles was done with reading all the collected articles one by one. If the news article was not related to food packaging, plastic packaging, trashing with packaging, plastics and food, food waste or waste food, they were not chosen to the data. Virtually all the news articles that mentioned food packaging or matters related to it were relevant at this point. With some of the news articles, it was obvious right away that they are either included or excluded. With some cases I needed more thinking and put them first to “maybe” category.

I carefully analysed each news article placed in the “maybe” category. There was a column in the Excel table that defined the theme of the news article in a few words. Initially, almost

10% of all news articles were in the "maybe" category. As the process progressed, "maybe" category's content themes evolved into standard words. In the end, I managed to rule out several "maybe's" at once because the standard words describing the content themes indicated that the content was not relevant to the data. Appendix 1, at the end of the thesis, illustrates standard words that describe the content of news articles generated during the process. All these topics listed in Appendix 1 were found in the "maybe" category and were found to be irrelevant. Naturally, topics such as climate change and the circular economy also appear in the relevant data, but only when they relate to food packaging. Most of the "maybe" category ended up being irrelevant, but a few were also revealed to be relevant. These relevant ones were usually news articles that, by their title, were not revealed to be part of the food packaging debate, but on closer inspection they did address food packaging topics in a few sentences. The "maybe" category was shrinking all the time and eventually all the news articles were defined to be either included or excluded from the final data and there were 597 news articles to be included. The coding of the news articles into different nodes took place in NVivo. (NVivo opens in section 3.4).

Of these 597 news articles, the articles used as a database for this master's thesis (216) were carefully selected using the features of NVivo. The 597 news articles were coded under several different codes in NVivo. The first steps in the coding took place by manually reading all the news articles and at the same time coding them into different categories. After the manual encoding step, it was time to use word search for encoding. In the word search phase, different words and word combinations were used to search for all the news articles about food packaging. These searches excluded news articles from non-food packaging, as well as news articles on food waste and waste food that did not mention food packaging, and news articles on trashing without mentioning food packaging. However, after the coding step, all the excluded news articles were read through, and it was checked whether all the contents of the food packaging were included. All selected news articles were then read through once more to make sure they were talking about food packaging. At this point, the research perspective was narrowed down, and certain themes were removed. Deleted themes can be found in section 3.3.1. The 216 news articles used as data for this master's thesis are listed at the end of the thesis in Appendix 2.

The line chart in Figure 3 shows how the number of news articles on food packaging varies from year to year. Total amount of news articles is 216 from which 68 are from business

media's and 148 are from general media. The lowest amount of food packaging news in the data was in 2013 with only three news articles and the highest was in 2018 with 50 news articles.

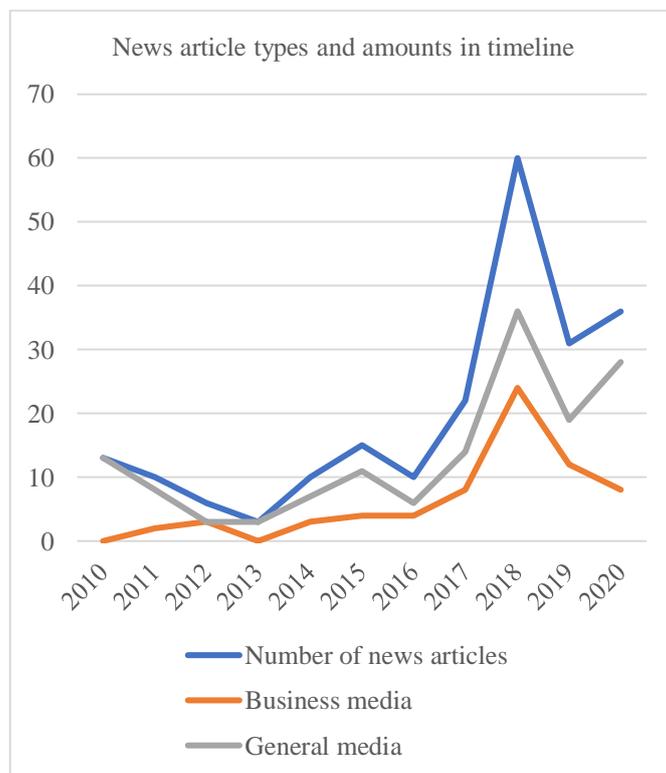


Figure 3 The amounts and the types of food packaging news articles in timeline.

In general media food packaging news articles are appearing every year, but in business media, there are years without any data to use in this master's thesis (2010, 2013). All the names of the news articles are found from Appendix 2. They are coded by the publishing year of the news article and by its name and the name shows the ID of the newspaper from which the news article originated (HS, T&T and KL).

From the Figure 4 pie chart we can see that 69% of the content of the data used in this master's thesis is general media news articles and 31% is business media news articles. General media news articles are the Helsingin Sanomat (148) data and business media contains both Tekniikka&Talous and Kauppalehti. KL has 44,1% (30) content and T&T has 55,9% (38) content inside the business media.

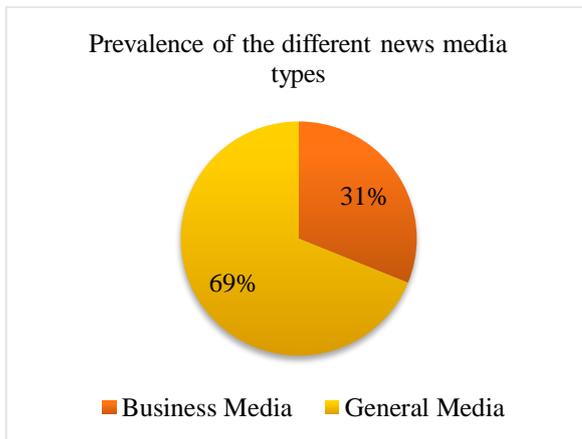


Figure 4 Prevalence of different news media types in data.

It might seem that general media is stronger here than business media, but from the next picture, Figure 5 clustered column, it can be seen, that when examining the relevancy of the data sources search for the project in total, Helsingin Sanomat had 8,71% relevancy rate in total, Tekniikka&Talous had 25,86% and Kauppalehti had 20,39%. General media relevancy rate is that how 8,71% whereas business media relevancy rate is 23,06% making business media more relevant source for this type of data than general media. In total relevancy rate was 9,6%.

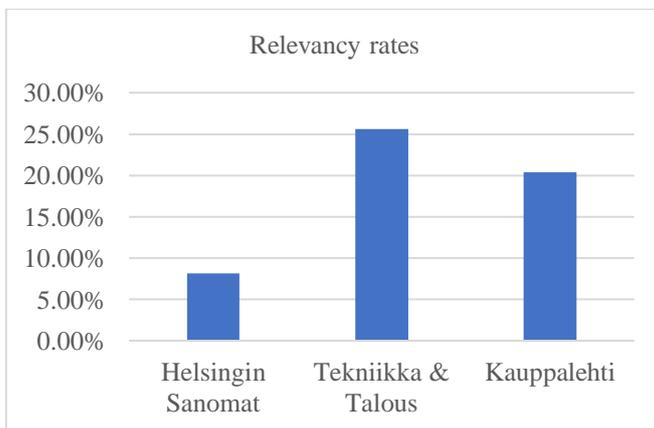


Figure 5 Relevancy rate of the different newspapers.

The relevancy calculation was done by using the original database. The amount of data from which the relevant data was separated carefully by the author, was 6 222 newspaper articles. From those 5628 news articles belonged to general media (HS) and 594 news articles belonged to business media (T&T and KL). The total amounts were compared with the ones considered relevant. This had to be done with the original database and not with the part of

database used in this master's thesis, because when the data were collected it was still unknown which parts of the data will be used in this master's thesis. Data were collected not only for this thesis but also to possibly be used in other projects, and the division into food packaging was carried out at a later stage after the relevant data had already been entered into NVivo and processed there. HS is a daily newspaper, whereas KL and T&T are published less frequently.

The relevance percentage calculation formulas were the following:

- General Media (HS): $460 \times 100 / 5628 = 8,17\%$
- Business Media (T&T 75): $75 \times 100 / 290 = 25,86\%$
- Business Media (KL 62): $62 \times 100 / 304 = 20,39\%$
- Business Media in total: $137 \times 100 / 594 = 23,06\%$.

Business media brought more content than general media.

3.3.1 Narrowing the Research Perspective

The topics occurring in the data, that have been left out from this master's thesis food packaging discussion, because of narrowing the viewpoint, need to be enumerated and the arguments behind the choices must be opened.

What has been left out is:

- 1) plastic bags discussion,
- 2) trashing when it does not have to do with food packaging,
- 3) trash collecting as a business abroad,
- 4) the font sizes in food packaging,
- 5) recycling instructions for consumers,
- 6) deposit bottle discussion and
- 7) EU banning single use disposable straws and cotton tops etc.

Plastic bags discussion was left out from this work because this work is concentrating to food packaging discussion in particular. Trashing discussion was left out from this work if it did not include food packaging trashing. Trashing discussion where food packaging was not mentioned was e.g., about plogging of cigarette butts. Plogging is the word for garbage

collection walk. Trash collecting as a business abroad was left out from this work if it was not considering food packaging. Trash collecting as a business abroad was considering collecting of trash metal and cardboard in emerging economies. It is considered as a business there and the people doing it are considered as sole entrepreneurs. The collected metal and cardboard are taken to recycling facilities for reusing and the collectors are being paid for it. The news about the font sizes of food packaging were discussing of new regulations of the font sizes of food packaging texts. Those were left out as irrelevant when considering the topic of the work which is sustainability of food packaging. Deposit bottle discussion articles were all collected to the original data base of the project but were left out from food packaging sustainability because of considering only beverage packaging now and this work is concentrating to food packaging, so for narrowing down the subject, beverage packaging was left out from this study. EU banning single use disposable straws and cotton tops made of plastic was left out from this work if it was not considering food packaging.

These topics were found, and the news articles were deleted from the research material throughout the data processing phase. The topics can still occur randomly in the data. For narrowing the viewpoint, this master's thesis focuses on topics more related to food packaging.

3.4 Data Analysis

Analysis and classification were performed using NVivo. NVivo is a market leader software program in qualitative data analysis. It helps with organizing, researching, analysing, and finding insights into a variety of qualitative materials such as media articles, web page contents, interviews, and survey responses. NVivo is developed by researchers, and it is designed to support the work of researchers in varied ways with data. The purpose of NVivo is to increase efficiency and effectiveness. (Jackson & Bazeley, 2007)

NVivo supports analysis of qualitative data with five principal ways:

- Managing Data
- Managing Ideas
- Data queries
- Graphic models
- Reports from the data. (Jackson & Bazeley, 2007)

From the news articles that were downloaded to NVivo (597), the data of this master's thesis is only from the news articles that were coded in NVivo under the node of *food packaging*. There were 216 of them.

The search words for the node *food packaging* in NVivo were:

- ruokapakka*
- ruokapak*
- muov* AND pakkau*

Also, muovi AND pakkaus and muovinen AND pakkaus were tried but they did not bring any useful content. The search was spread to surrounding paragraph. The coding process included multiple steps and phases with forming different matrices from the news articles in NVivo and reading and double-checking manually the news articles. When all the steps and phases were conducted, there were 216 news articles left and that maintained as the final amount of data of this work.

The data were thematized at an early stage to find out what kind of themes it included. In thematization, the research material was reviewed several times to find the main theme of each newspaper article. The obtained main themes were combined by color-coding into smaller and smaller upper themes, in the way that one colour always corresponded to one theme type, e.g., blue was the colour of marine litter and micro-plastics. The material was re-examined until each newspaper article was found to fall into one category and each category had to include more than one newspaper article.

From the Figure 6 the incidence of the main themes on timeline can be seen. The Figure 6 shows how the appearance of the thematized themes differentiates in different years under

examination. In general, the number of newspaper articles is directly proportional to the number of themes. In the first years of the research data, there is relatively little data compared to later years. There are also fewer themes in the early research years than in later research years. The number of themes will start to grow after 2016. At the same time, the amount of research data is also beginning to grow. Both the amount of research data and the number of themes in it will reach an absolute peak in 2018. After that, the amount of data and themes will level off and remain approximately at the same level for the last two research years (2019, 2020).

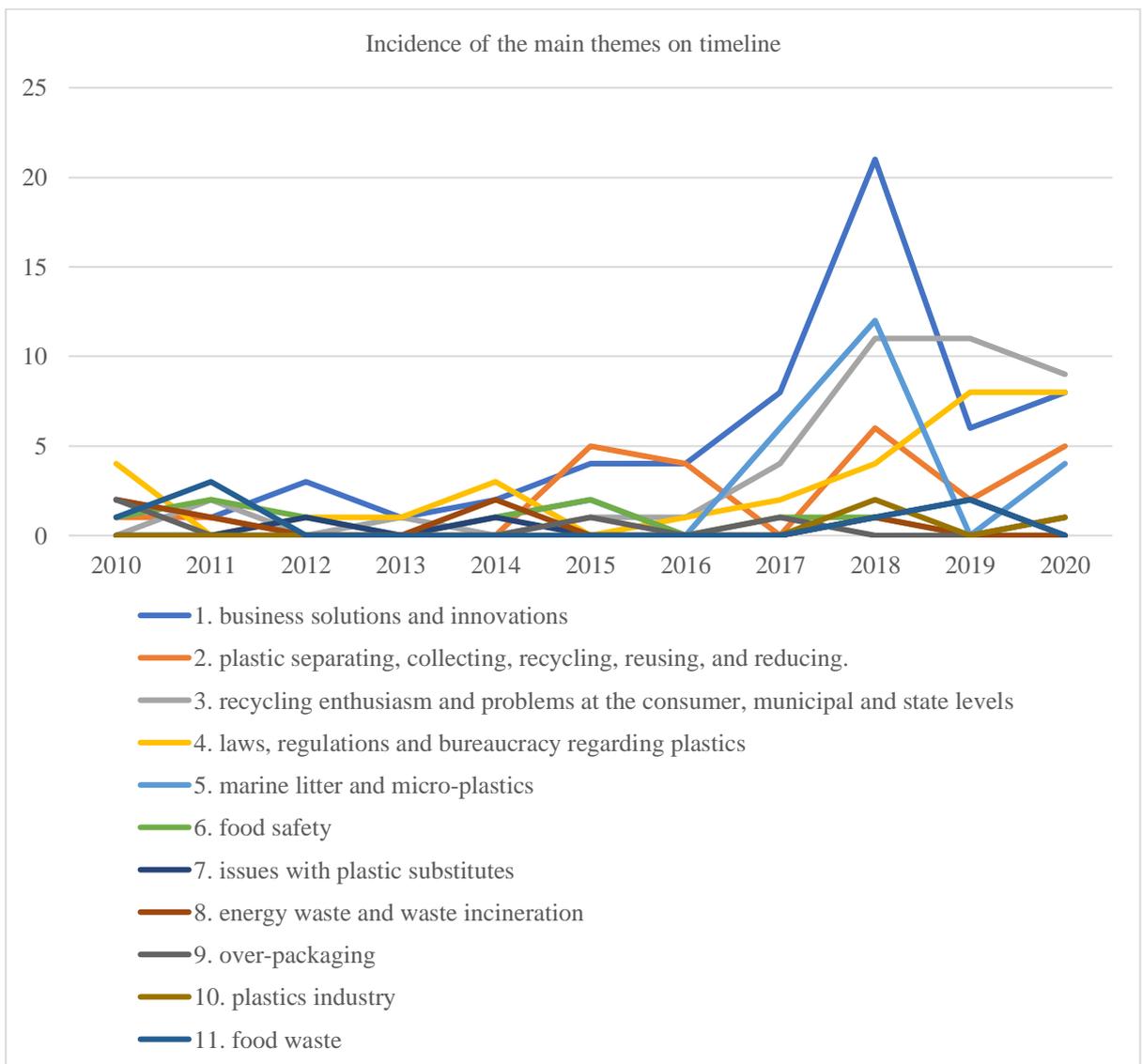


Figure 6 Incidence of the main themes on timeline

Table 3 below shows the results of the thematization. The total amount of newspaper articles used as research data was 216. These 216 news articles were divided into eleven main themes based on their content. Eleven main themes have been named so that the name describes the essential content. Each news article belongs to one of eleven themes. When multiple themes are presented within a single news article, the article is placed in only one category according to the main theme.

Table 3 The main themes from the data

Main theme	Amount of news articles
1. Business solutions and innovations	60
2. Plastic separating, collecting, recycling, reusing, and reducing	24
3. Recycling enthusiasm and problems at the consumer, municipal and state levels	40
4. Laws, regulations, and bureaucracy regarding plastics	32
5. Marine litter and micro-plastics	25
6. Food safety	9
7. Issues with plastic substitutes	5
8. Energy waste and waste incineration	6
9. Over-packaging	5
10. Plastics industry	3
11. Food waste	7

The thematization (Figure 6 & Table 3) helps to see what kinds of themes the data contained and how and when the themes appeared in the data. In addition, it increases the reliability and clarity of the research by showing that the research material contained continuity with respect to the themes. After the thematization, I started looking in the research material if food packaging solutions and innovations were mentioned in other news article than the ones belonging to the first theme Business solutions and innovations.

I did a new search on NVivo with the following search words:

- innovaa*
- pakkaus AND innovaa*
- start*
- kuitupakka*
- hemisellu*
- pakkauskalv*
- sellu*
- teknologi*

The search words mentioned above were identified from the titles of the news articles and they brought 17 more news articles to include. Then I read the titles of all the rest of the news article data (139) that were still not involved in suggestions for food packaging, to find out, if there still was relevant data that NVivo search had not found. With this method five (5) more news articles were added. After the search the 22 pieces of data were added to the 60 pieces of data (the theme 1) that was already decided to be used. There were then 82 news articles providing solutions for replacing plastics and reducing food waste. On closer inspection, I noticed that out of these 82, 66 news articles dealt with innovation precisely. The remaining 16 dealt with either solutions or structural changes directly or indirectly related to the food packaging sector. In other words, 80% of these mentioned solutions were innovations. I used these 66 news articles to find answers to my second research question.

3.5 Reliability and Validity of the Research

In qualitative research, new research methods often emerge along the way. The issues of quality can be assessed from different perspectives, such as "credibility", "reliability", "reassurance" and "ethics". When conducting qualitative research to describe "trustworthiness" researchers often use "credibility," "reliability," "transferability," and "confirmability" and ensure it with several methods. Reliability of qualitative research is enhanced by the author's detailed description of the various stages of the research and their implementation. Central to qualitative data analysis reliability is making classifications. The rationale and origins of classifications should be opened to the reader. (Chowdhury, 2015; Hirsijärvi et al., 2009)

Validity can be said to describe the competence and qualification of a study. Whether it has been done thoroughly and whether the results obtained, and the conclusions reached are "correct". Errors in research can arise, for example, from the researcher seeing relationships or principles incorrectly or asking the wrong questions. Validity in qualitative research - especially if the research is not assumed to directly describe reality - can rather be understood as credibility and persuasiveness. How well the constructor produces constructions for others to understand. Research can usually touch the surface of the phenomenon under study, and the phenomenon under study can never be fully described in the report as it appears in the research situation or to the researcher, but in most of the cases sole research cannot produce complete understanding. (Saaranen-Kauppinen & Puusniekka, 2006)

Qualitative research seeks to find different perspectives from which the topic can be examined (Puusa et al., 2020). In the ethical evaluation of research, the research methods are worth considering, e.g., whether the desired data can be obtained with the intended data collection methods. It is the ethical duty of the researcher to report the research results as honestly and accurately as possible. A qualitative study should show how the analysis process has progressed and how the results presented have been obtained. Simply presenting the results without describing the analysis is not enough. (Saaranen-Kauppinen & Puusniekka, 2006.) When presenting the results of the study, the data should not be presented in too much detail. The purpose is to convey enough information to the reader to successfully understand the context of the research. (Puusa et al., 2020)

This study was conducted using naturally occurring secondary data. It is conceivable that it is easier to obtain ethical approval for research that includes naturally occurring data than for research that involves explicit data collection (Lister et al., 2010). The secondary data, news articles published on newspaper websites, can be considered a reliable source in the sense that at the time of the investigation, the news articles used as data were already published and thus unchanged in content. When considering the consistency of the results, what is to be considered in this master's thesis is, e.g., where the data is from. The sources in question are Finnish newspapers, their news articles published on newspaper websites. Newspapers used as sources are generally considered to be valid and reliable and give a reliable picture of the Finnish media debate. (Suomen tietotoimisto, 2021)

In this study, temporal reliability can be said to have some significance. The period from which the data is collected determines the content of the data in many ways. First, certain perceptions of sustainable development are talked about in the news media in certain words during certain research years. For example, the word climate change was preceded in the media debate by the word global warming, and this was preceded by the greenhouse effect. This means that when researching a particular phenomenon from published material, the researcher must be aware of the history of that phenomenon, such as the occurrence of words describing the phenomenon at different times and eras.

To demonstrate transparency and reliability, the various steps of data collection are documented with sufficient accuracy for the work. The search words, and the search word combinations, as well as the additional search words that have been used to search the data in different stages, and the results they bring, are documented in this Chapter 3 in subsections 3.3 and 3.4. Also, the words describing the content of news articles that were excluded from the final data can be seen from Appendix 1. It can be said that in this master's thesis the desired data are obtained by the intended data collection methods. The data collection method used, provides a diverse picture of the food packaging debate in the Finnish news media with revealing several different themes of discussion. The process of forming the themes of discussion created from the research data has been opened and described with precision for the master's thesis which can be seen in subsection 3.4. Thematization of the data increased the reliability and clarity of the research by showing that the research material contained continuity with respect to the themes.

4 EMPIRICAL FINDINGS

This chapter discusses the findings based on empirical data analysis in response to the research questions presented in Chapter 1. The two main findings of the study can be defined as follows: the various themes under discussion and innovations to replace fossil-based plastics. Eleven themes were identified among the news articles. The innovations were mostly considering food packaging materials.

4.1 Themes

A wide variety of different themes were identified. Next, I describe what is the main message of each theme in terms of sustainable food packaging and open the content of the themes. Theoretical connections to the literature opened in the Chapter 2 are presented when available.

The research question considering this section was:

- What are the different themes of discussion concerning the sustainability of food packaging in the selected Finnish newspapers?

The newspapers published food packaging articles increasingly during the research period. I defined eleven main themes of discussion from the newspaper articles. The different themes are 1) business solutions and innovations, 2) plastic separating, collecting, recycling, reusing, and reducing, 3) recycling enthusiasm and problems at the consumer, municipal and state levels, 4) laws and regulations, 5) marine litter and micro-plastics, 6) food safety, 7) issues with plastic substitutes, 8) energy waste, 9) over-packaging, 10) plastics industry, and 11) food waste.

1. Business solutions and innovations

The main message of this theme is that food packaging can be brought into line with a sustainable model by innovating new materials and inventing solutions for replacing plastics and reducing food waste. This theme has remained relevant throughout the research years, as evidenced by that it appears in the data in each year of research, and that it is by far the most common of all the themes. In 2012 it was mentioned in that VTT and Aalto University developed a method for producing materials such as wood-based plastic on a large scale (2012/3). In 2015 it was said that spruce hemicellulose, a by-product of the paper industry, may end up in food packaging in the future (2015/10). In 2016 there was a news article about protective membrane made from milk protein which preserves food better than plastic. The membrane can even be eaten. (2016/7)

Business solutions and innovations are an essential part of sustainability transition of food packaging. Transitions can threaten incumbent industries, which is why incumbents use power to protect themselves and resist transformative innovation. At the same time, however, new entrants and those advocating alternative socio-technical changes are lobbying for public support. (Köhler et al, 2019.) Business actors focus more on reducing unsustainable business-level behaviour than on increasing system resilience by making radical changes between actors and levels (Loorbach et al., 2010). Innovations in packaging materials and manufacturing processes that better preserve the quality and freshness of food during its distribution and storage are important because packaged food prevents and reduces food waste (Keränen et al., 2021).

2. Plastic separating, collecting, recycling, reusing, and reducing

The main message of this theme is that the following activities will bring food packaging into a sustainable model: separating, collecting, recycling, reusing, and reducing. This theme includes topics like e.g., zero waste -lifestyle and black non-recyclable plastic food packaging. The recycling of plastic packaging started in Finland in 2016 (Suomen Uusiomuovi Oy, 2022) and The EU Plastics Strategy was

adopted in January 2018 (Viitanen et al., 2021). They act as significant factors, especially behind this theme. In 2010 plastic packaging was sorted lazily by Finns (2010/3) but in 2020 the Finns wanted to sort their waste and there were many opportunities for that. Sorting is worthwhile, as the collection of plastic packaging is considerably cheaper for housing association than mixed waste. Only by recycling plastic waste can new products such as dish brushes and flowerpots be obtained. (2020/15.) The depletion of natural materials and the resulting societal changes call for more and more precise recycling of materials. One important area for development is plastic recycling. One of the goals for the future is to start planning the recycling of plastic products and packaging at the very beginning of the product's life cycle, when designing the packaging. (2014/7)

For achieving sustainability, food packaging should meet the requirement of circularity in meaning that at least reusability and recyclability must be solved already in the producing phase (Pauer et al., 2019). Recycling packaging significantly reduces its environmental and climate impact (Mendes & Pedersen, 2021). The recycling of packaging materials and delivery logistics solutions must be developed considering the potential of digital systems (Sözer et al., 2021).

3. Recycling enthusiasm and problems at the consumer, municipal and state levels

This theme addresses both the enthusiasm for waste recycling and the difficulties of it at three levels: consumer, municipal and state. This theme has appeared in the data regularly since 2017. In addition, this theme includes discussion on non-functioning waste recycling solutions. The main message of this theme is that several recycling functions need to be improved before they can facilitate the transition of food packaging to a more sustainable model. In 2018 it was said that plastic recycling could work much more efficiently, but the different parties responsible for recycling are transferring responsibilities with each other. It appears to the consumer at the recycling point as full and dirty recycling bins, as well as the remote location of the recycling points. The prerequisite for plastic recycling is to travel to the collection point by car or public transport. (2018/6)

The short-sightedness of citizens and the need for businesses to ensure short-term survival make it difficult for policymakers to achieve the ambitious goals of sustainable development programs. Some technical solutions have ultimately only strengthened the technical and institutional impasse by supporting current failures. (Farla et al., 2012)

4. Laws and regulations

This theme deals with laws, regulations and bureaucracy related to plastic and the recycling of it. It includes topics such as producer responsibility and Waste Act. It covers news articles about the EU and the Finnish government. The prevalence of this theme has been the highest in 2019-2020, but the theme has been included in the data since the first research year. The main message of this theme is that more tight laws, regulations, and bureaucracy will help the sustainability transition of food packaging. In 2020 there was a news article saying that a new draft Waste Act is currently being debated in Parliament. If the proposal becomes law in the fall, the requirements for plastic recycling will increase. (2020/14)

Transitions in society inherently become political processes as different groups and individuals disagree about different directions of transitions and appropriate ways to sustain such processes, and because transitions often lead to winners and losers (Köhler et al., 2021). Especially in the EU, a market-driven shift from fossil plastics to more environmentally friendly alternatives is expected due to consumer demands. In the EU, change is strongly influenced by current and future policy decisions, including requirements for plastic recycling and restrictions on certain disposable plastic products. (Viitanen et al., 2021.) If government actors find solutions that keep the current system largely unchanged, with little change in existing technologies, business models or practices, there will be no socio-economic transition (Kelemen, 2020).

5. Marine litter and micro-plastics

Marine litter and micro-plastics were not mentioned in the newspaper debate before 2014. These issues were not yet considered relevant to the climate change debate in the early years of the study. These issues have been raised in the press gradually. The main message of this theme is that consumers should pay attention to whether their activities are contributing to the littering of the seas and the integration of micro-plastics into the environment and, ultimately, into everyone's food chain. Consumers should recycle food packaging properly to prevent this. It was said in 2017 that there may be more plastic in the seas than fish in 30 years, unless the packaging industry changes radically (2017/1). The debate on this topic culminated to a news article from 2020 saying that modern humans are already exposed to micro-plastics during the fatal period (2020/36).

Food packaging is one reason for trashing and marine plastic litter problem and the micro-plastics all over (Licciardello, 2017). The pressure to bring food packaging into line with the sustainable development model began when people worldwide woke up to the littering of the oceans. Much of the ocean's plastic waste comes from non-biodegradable packaging materials. (Viitanen et al., 2021)

6. Food safety

The dangers of plastics and food safety in considering human and animal health, when it comes both to plastic littering, and the use of recycled materials in food packaging are considered in this theme. The main message of the theme is that people's indifference to the recycling of food packaging has led to the death of animals and that food safety is not always guaranteed when using recycled materials in food packaging. Researchers have found that toxic chemicals from recycled newspapers have contaminated food sold in cartons (2011/3). 20 kg of plastic was found in the stomach of a dead giraffe. The plastic is probably from food packaging that people who visited the zoo had thrown into the cage over the years. (2012/5.) The chemicals used in food packaging materials can move from packaging to food and cause a risk of cancer or harm to hormone production (2014/1). Recycled

material is not suitable for food packaging. Use of virgin board guarantees food safety. (2015/14.) The theme includes news articles that talk about whether packaging food in plastics endangers the health of consumers, as plastics release chemicals into food and these end up in the human body when eaten. The plastics industry defends itself: "the premise is that no dangerous substances are transferred from packaging". (2018/20)

A core function of food packaging is to ensure the environmental safety and human health (Pauer et al., 2019). Protecting the content ensures the quality of food and maintains food safety throughout the supply chain (Otto et al., 2021). Expertise in the development of food contact materials legislation is essential for food packaging safety (Sözer et al., 2021). The separation of food safety from food sustainability leads to the interruption of the ongoing debate about the sustainability transitions that are necessary to solve the problems caused by conventional food systems. In the food packaging debate, health should be added as a fourth pillar to the group with TBL. Food safety should be seen as an integral part of the food industry sustainability debate. (El Bilali et al., 2019)

7. Issues with plastic substitutes

This theme addresses that those new materials that are intended to replace traditional plastics in food packaging are not problem-free substitutes. The main message of this theme is that consumers should not blindly trust new bio-based materials to be the solution to sustainable food packaging. Researchers are proposing a ban on consumer use of biodegradable plastic. They base their views on, among other things, the life cycle of biodegradable plastics and the environmental impact of bioplastics. They say that bioplastic is not a more ecological solution or answer to the environmental problems of our planet. (2018/17.) A bioplastic bag did not rot even in three years. It is important for consumers to understand the differences between different types of plastics and the need to recycle them properly, and that there is no miracle material. (2019/9)

Bioplastics-type innovations have been considered as sustainable innovations that include new or improved processes, products, services, organizational and marketing methods that significantly reduce negative environmental, social, and economic impacts (Keränen et al., 2021). Although bioplastic packaging materials have a lower climate impact, there are other environmental impacts, such as eutrophication of water bodies, water and pesticide use levels, and impacts on biodiversity. These reasons speak in favour of non-bio-based materials, and this must also be considered when talking about different material options. (Mendes & Pedersen, 2021.) The development of bioplastic materials is not yet at a sufficient level to meet durability of traditional plastics, which can lead to increasement of food waste (Viitanen et al., 2021).

8. Energy waste

This theme deals with the energy fraction and waste incineration. Before the recycling of plastic packaging began in Finland, the plastic suitable for incineration was widely recycled to the energy fractions. Incineration of waste from the energy fraction was used e.g., to heat production. The theme also addresses how the private consumers burn waste in their backyards. The energy fraction was mostly phased out in 2016, so this theme is no longer very relevant today. One main message of the theme was related to the utilization of food packaging waste in heat production. In 2015 a consumer asked in an opinion piece: “Why do I, as a consumer, must look for and research the little packaging labels on plastic package to see if that package can be put in energy waste or not? (2015/11)

9. Over-packaging

This theme addresses the issue of over-packaging as one solution to more sustainable food packaging. The theme appears in the data in both the first and last year of research, and very rarely in between. The theme cannot therefore be seen as the main solution to the sustainability transition of food packaging. In 2017 it was reported: “You’ve just made the dumbest purchase of your life” –individually packed strawberries are raging in Hong Kong. In China, food fears lead to over-packing of fruits and berries. (2017/5)

10. Plastics industry

This theme covers the news articles considering business in plastic industry, but not mentioning innovations. This theme only appears a few times in the entire data. The theme includes news articles about companies in the packaging plastics industry. The main message of the theme is to spread information about the activities of large MNEs to consumers. In 2020 an environmental movement said that Coca-Cola, Pepsi Co, and Nestlé are the worst polluters of plastics for three consecutive years. The MNEs have not made progress in their efforts to reduce the amount of plastic waste. (2020/33)

11. Food waste

This team talks about the lower environmental load of food packaging comparing to food waste. The news articles in the theme emphasize to consumers that food packaging itself is not as big of an evil on the environment as the generation of food waste. The theme emphasizes the positive effects of proper packaging on the environment. The most important function of plastic as a food packaging material is to combat a much greater climate nuisance which is food waste. In single-person households, food waste costs about one hundred euros a year. (2019/3.) Food waste can be avoided by better planning food consumption and buying smaller quantities (2013/1).

It is estimated that one third of food produced worldwide is either lost or wasted before and after it reaches the consumer (Keränen et al., 2021). Food waste has become a common concern that requires urgent preventive action. There is a general perception that packaging is responsible for the high environmental impact, although scientific evidence speaks to the benefits of packaging in reducing food waste. (Licciardello, 2017.) Without packaging, the food is not protected from the external and internal reasons that lead to food waste. External reasons can be e.g., that the product is damaged during transport and internal can be that the grocery spoils faster without the protective material around it. Even if the reduction in food waste

is small, it is often advisable to use packaging materials for foods that have a high environmental impact. (Otto et al., 2021.) The use of plastic, especially in combination with vacuum packaging, has significantly extended the shelf life of food and reduced food waste. Currently the development of bioplastic materials is not yet sufficient meaning that the use of the new materials can lead to increasement of food waste. (Viitanen et al., 2021)

When considering what kind of themes the media brings out, we can see that certain themes are mentioned more often than others. The frequently mentioned themes are business solutions and innovations, plastic separating, collecting, recycling, reusing, and reducing, recycling enthusiasm and problems at the consumer, municipal and state levels, and marine litter and micro-plastics. The themes mentioned less frequently in the debate are food safety, issues with plastic substitutes, over-packing, energy waste, plastics industry, and food waste.

It does not necessarily say that the topics mentioned more often in the news articles are more important. One explanation for why some of the themes important for climate change mitigation are not mentioned more often in this data is that only news items related to food packaging were collected during the data collection phase. It is worth considering why the media deal with some themes more often than others when it comes to food packaging. It is possible that the press will write more often about issues that are relevant to the functioning of society. Of the themes, these were, all the most frequently appearing ones. Of the less frequently mentioned ones, a few can be distinguished for various reasons.

The theme of energy waste can be defined as somewhat irrelevant today, as the collection of energy fraction from consumers was driven down and replaced by the collection of plastic packaging. The theme of overpackaging, on the other hand, can be defined as relevant in this debate, although reducing it alone will not yet solve the sustainability transition of food packaging. The theme of plastic industry included discussion on the small and medium-sized companies (SMEs) and the MNEs spreading information about their activities but was not wide enough to be a significant theme among the others.

On the other hand, the significantly relevant topics mentioned less frequently in the newspaper articles, were food safety, issues with plastic substitutes, and food waste.

Food safety can be said to be an integral part of this debate, so it could be imagined receiving more mention than it has received in this material. The same can be said for the issues with plastic substitutes and food waste. Food safety is a matter of great importance to consumers and perhaps the food safety problems of food packaging will not be raised in the press in vain, so as not to frighten consumers.

The shortcomings and defects of bioplastics may not talk about in the press tremendously, as many large forest and paper companies are moving from paper to new bio-based materials. For traditional paper companies, the transition to the digital age has meant leaving the comfort zone and putting tremendous pressure on the future. Materials intended to replace fossil plastics may be a way for such companies to survive, as their production and sales could close the gap created by declining demand for paper. Thus, raising the problems of bioplastics is very crucial for these MNEs.

Consumers generate a significant proportion of food waste in households by buying beyond their own needs (Luukkanen, 2017). Perhaps the cash flow in the food and packaging industry would come to a halt if the amount of large food waste generated by consumers were better covered in the news media. With regard food waste, it can be said that it is discussed in the media in general, but based on this study the connection between food waste and food packaging has not been discussed as much as might have been expected.

4.2 Innovations

Innovations are opened in this section and theoretical connections to the literature in the Chapter 2 are presented.

The research question considering this finding was:

- What innovations are offered in the newspaper articles to increase the sustainability of food packaging?

The innovations offered in the newspaper articles to increase the sustainability of food packaging were mostly considering materials. Majority of the offered innovations are new innovative materials for plastic substitutes.

The Figure 7 below presents the incidence of innovations in general and business media in timeline. We can see that business media provides more news articles mentioning innovations than general media. In 2018 business media content provided particularly many news articles mentioning innovations.

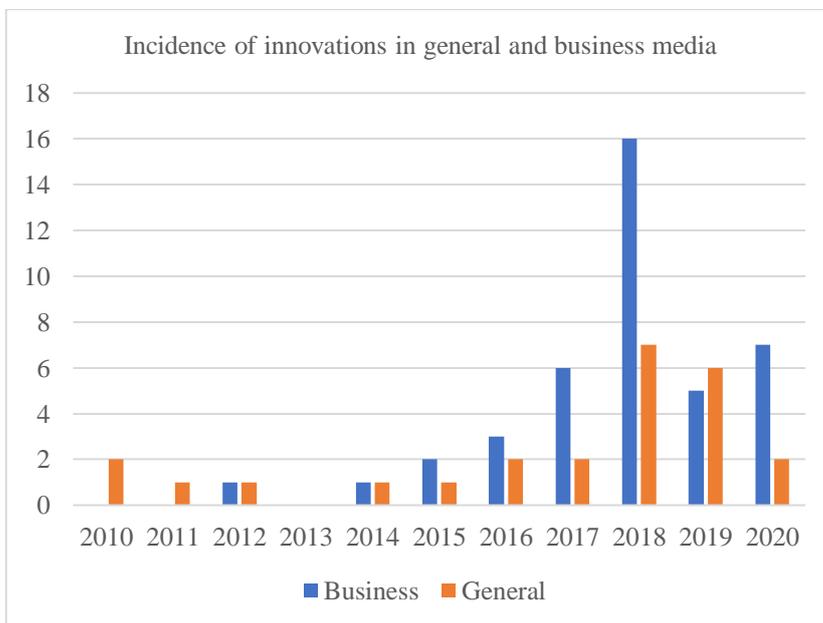


Figure 7 Incidence of innovations in general and business media

Majority of the innovations were talking about innovative materials for replacing plastics and the rest were considering materials or technology. The Table 4 shows the variety of different words used in describing the innovative material for replacing plastics. There can be more than one material mentioned in one news article. The Table 4 tells that the vocabulary on material innovations has expanded widely from the early research years. From 2016 onwards the innovations have increased in volume and specialized in content. It can be seen by looking at both the spectrum of words that describe the different materials and the amounts of the news articles mentioning innovations. The most popular words describing the innovations in the Table 4 are pulp, biodegradable, cardboard, bio -based, cellulose, recyclable and recycled. When examining the words mentioned less often, we can see that e.g., smart (packaging) occurs very occasionally in the data, as does paper, and milk protein.

Fibre does not occur at all before 2016. The word bioplastic is mentioned rarely, but biodegradable and biobased are mentioned more often and they both belong to bioplastics.

Table 4 The different words used to describe the material innovations

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
pulp	1		1			1			2	2	5
smart		1			1			1			
bio -based			1						1	3	1
paper	1								1		1
biodegradable	1						1	3	6		2
cardboard	1				1		2	2	2	2	
edible						1	1				
milk protein							1			1	
fibre							1		1	1	1
bioplastic								1			1
wood								2	3	1	2
biopolymer									1		
cellulose						1			3	1	1
maize								1		1	
sugar								1		1	
castor oil										1	
nano	1	1									
renewable									3		
recyclable							1	2	2	3	2
recycled	1						1		2	1	1
eco					1			1			

The main finding considering the food packaging material discussion across the line is that traditional fossil-based plastic needs to be replaced with another material. The suggestions considering replacing materials can be roughly divided into three groups. Those are:

- wood (wood pulp, wood fibre, wood-based, wood composite, wood chips, hemicellulose, cellulose, compostable cellulose, dissolved cellulose)
- cardboard (traditional, biodegradable, eco-, recycled, plastic-free, rotting, lacquered)
- bioplastic (biodegradable, bio-based, biopolymer)

In the news articles, these terms were used partly overlapping. Wood is the raw material to make pulp, chips, cellulose and both cardboard and bioplastics. Cardboard is made from paper which is made from wood fibres meaning cellulose, hemicellulose, and lignin. Pulp is another word for cellulose. (Salmén, 2018.) Bioplastic is a roof concept for materials which are either bio-based plastics or biodegradable plastics, or both. Biopolymer is raw material for making bioplastic. Bioplastics are made from renewable raw materials, like wood fibres

or other plant-based materials, whereas traditional plastics are made from fossil based raw materials. (Finnish Plastic Industries Federation, 2020b). The majority of the innovations are thus wood-based.

Innovations that were not based on the development of new material were a minority among the innovations featured in the news articles. These innovations covered the following topics:

- new technologies to prevent plastics from entering the environment (2018/13),
- chemical recycling (2019/7, 2020/20),
- utilization of recycled packaging plastic as a raw material for industry (2016/8)
- increasing the number of recyclable plastics in packaging (2017/1).

For the transition from existing unsustainable technologies and solutions to new sustainable ones, the former must be phased out (Kelemen, 2020). Efforts must be made to create new innovations for the recovery of waste and by-products. Finland's strengths in the food packaging industry are high-tech know-how, the transparency of the food chain and the use of citizens and information technology in innovation processes. (Sözer et al., 2021). In recent years demand for more sustainable packaging innovations has increased due to environmental issues related to packaging. Bioplastics are a potential innovation that can contribute to sustainable development in food packaging. Bioplastics-type innovations have been considered in the literature as sustainable innovations that include new or improved processes, products, services, organizational and marketing methods that significantly improve positive environmental, social, and economic impacts. The challenge for sustainable innovation is to combine ecological and social aspects alongside economic ones. (Keränen et al. 2021)

Although the plastic value network for food packaging is under increasing pressure to introduce new sustainable innovations, their dissemination is problematic due to well-established systems in the sector. New bioplastic packaging materials create pressure and opportunities for the existing business network involved in the production of conventional food-grade plastic packaging. The necessary changes to the existing business network can materialize if the new packaging materials can bring improvements to existing solutions from the perspective of manufacturers and end users. (Keränen et al. 2021.) Transitions can take decades to unfold, as the development of radical practices and innovations is largely

long-term and gradually builds on previous small-scale application developments before spreading widely (Köhler et al., 2019).

Awareness of the importance of innovations for food packaging industry and for Finnish society can be spread through journalism. The significance of innovations is not only to invent a new functional solution to replace fossil plastics, but innovations can be seen as vital for a small technology expert like Finland to stay competitive.

5 CONCLUSIONS AND DISCUSSION

The aim of the study was to examine the newspaper debate on the sustainability and sustainability transition of food packaging. The research period was eleven years. During the period, the tone and content of the discussion changed several times. The study was able to find several themes. Some of the themes appeared and disappeared many times over the years. Some of the themes were mentioned occasionally and some remained in the frame throughout the study period. The thematization of the news articles showed that there was continuity in the research material.

Besides themes, the study concentrated to examining innovations from the data. The main innovations in the sustainability transition were new materials to replace fossil-based plastic from food packaging. The innovations were addressed in the media both by creating a picture of success in the food packaging transition, which will help to minimize the negative consequences of climate change, and by creating horror images of future biodiversity loss and climate change. The treatment of the sustainability transition of food packaging in the media was multidimensional and wide-ranging.

The research year 2018 stood out significantly. In that year, the number of relevant news articles peaked. Most likely, this is because the EU Plastics Strategy was adopted in January 2018 (Viitanen et al., 2021). The peak of 2018 can also be explained by that MEP Heidi Hautala published on the social media the Plastic Free March (Muoviton maaliskuu), which was taken up by several public actors and social media influencers and thus received commendable media publicity (Suominen, 2019). It likely boosted news media writing about giving up fossil-based plastics more widely.

According to the literature used in this master's thesis, sustainability transitions are long-term, complex processes of change (Coenen et al., 2012) that can take decades to unfold (Köhler et al., 2019). The results of the empirical study show that Finnish newspapers also emphasize that sustainability transition of food packaging is a multidimensional and long-term process that requires the participation of all actors in society. The media discusses responsibility and sustainability usually with describing individual issues and reducing the

complexity of the whole topic with stereotypes that run the risk of dealing the matter only from the surface (Hoffhaus & Lubjuhn, 2010). The results show that this is partially realized as the role of bioplastics as a saviour is emphasized and problems with their consumer use are mentioned only in a few news articles during the whole research period. Recycling is constantly mentioned as a solution, but its backgrounds are not opened in-depth. News articles on recycling often confront companies and decision-makers. Despite the importance of sustainability issues in the media, they are still fragmented topic (Bondafelli, 2010). The fragmented image is supported by that some of the themes are mentioned only occasionally. In addition, the whole food packaging debate has received very little attention in 2011-2013, although it has already received more attention in 2010.

Because sustainability can be considered as complex and abstract concept, issues to do with it, like man-made climate change are entering the media agenda as emotionalized and scandalized matters. (Bondafelli, 2010) This can be seen especially when it comes to discussing marine litter, micro-plastics, and food safety. These matters are talked in the media by creating horror scenarios for the fish-free plastic seas of the future, and by highlighting how rubbish thrown by humans into land and seas becomes the fate of innocent animals, and with talking about the exposure of modern humans to micro-plastics even before being born.

It might be, that the media can discuss sustainability transitions of food packaging with only scratching the surface of the phenomena, but, because the influence of news media on decision-making and consumer purchasing behaviour is strong (Boykoff & Luedecke, 2016; Yadavalli & Jones, 2014), it is also possible to increase knowledge about the sustainability transition of food packaging through the media. The media play an important role in the transition to sustainable food packaging. This is especially true in a country like Finland, where consumers are educated and closely follow and trust the media. The media can provide information on more sustainable packaging solutions than at present, but the final choice lies with consumers. Whether consumers change their consumption behaviour based on the media coverage depends to a large extent on the reliability of the news source and consumers' knowledge of the topic (Yadavalli & Jones, 2014). If consumers do not start using or recycling food packaging properly, none of these measures will be significant. After all, the key to the success of such a transition that requires changes in consumer habits depends on

the consumers. However, at its best, news media has a strong impact on behavioural changes (Boykoff & Luedecke, 2016). Sustainable messages can reach people through the effective use of media formats and people can change their attitudes and behaviour as they learn from the media (Hoffhaus & Lubjuhn, 2010).

The most enduring topic in the ongoing debate in newspapers is the development of material innovations as a solution to replace fossil plastics. The new material innovations can be seen as disruptive innovations that displace previous structures, in this case the fossil plastics. Most of the material innovations presented are wood-based and forestry has a long tradition in Finland. Finland's forest resources are practically 100% certified, which is a very significant factor in terms of sustainability and can even be considered a global competitive advantage (Partanen, 2022).

Because the media puts these concrete technological innovations at the forefront, their background needs to be considered. The material innovations are driven by raw materials, production processes and the life cycle of packaging. For the entire production process to be in line with the product, attention must also be paid to the use of renewable electricity in production and to carbon neutrality of the process. The product development of bio-based products is very complex and requires background research and development, which can be provided by, for example, VTT and technical universities such as LUT and Aalto University. To do this, they need long-term, sufficient resources from the society, and it is up to policy makers to secure the adequate funding.

The media studied here emphasizes technological innovation, but not, for example, business model innovation. Finland is a strong technology expert, but also a small and remote country. The strengths of a small technologically oriented state lie precisely in technical know-how rather than in creative global entrepreneurship. It might be a notable social alignment that the media puts a lot of responsibility on Finland's traditional know-how and strengths. The traditional strengths of Finland lie in forest resources, its existing industrial infrastructure, and the ability to invest to technology. It may be that large companies are more easily seen in the Finnish public debate in their role as employers than as innovative business actors. Start-ups, on the other hand, have a clearly innovative image, which may be since start-ups are not yet considered significant employers from the perspective of decision-makers. The

MNEs and other large companies inner transiting processes to do with their business models are not put in frame. Still, before the manufacturing processes of the new material innovations can be implemented, the business models of large companies must have been revised to reflect changing business environments and market demands. It may be that the discussion on business model innovations is a debate within businesses and not a general debate.

When considering the results achieved in a broader perspective, the role of consumers in the food packaging transition will undoubtedly become important. If consumers do not adopt the changes made by decision-makers and implemented by companies and organizations, the sustainability transition of food packaging will not materialize or succeed. Decisions are often made at a higher level like in the EU. Businesses and other actors must comply with regulations and laws, but it is very much more difficult to monitor the activities of an individual consumer than of a company or other organization. At this point, future research might focus on consumer behaviour. It could combine both economics and sustainability science to collaborate with behavioural sciences. Interdisciplinarity is becoming increasingly prevalent and diverse expertise is valued. Further research could explore what motivates consumers in their daily lives and how consumers build their responsibility by learning from the media and what impact this has on purchasing decisions. In today's interactive world, it is possible to gather research data directly on how consumers react to a particular piece of news, as news articles can be commented on in real time on online newspapers' websites.

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APPENDICES

Appendix 1 First analysis to exclude news articles

Words describing the content of the news articles, based on which the news articles were analysed as irrelevant.

alcohol
animals
beverages
business
candy
cars
circular economy
climate change
corona
cosmetics
crimes
culture
dairy
economy
farmacy drugs
food
history
life
maternity pack
obituary
packaging
politics
restaurants
smoking
sports
technology
traveling

Appendix 2 The news article data in chronological order

2010

2010/1 <Files\\HS_pakkaus_5.3.2010_Tuottajille lisää vastuuta pakkausjätteen keräämisestä>

2010/2 <Files\\HS_roska ja muovi_14.3.2010_Kauppakassista tuli kuuluisa>

2010/3 <Files\\HS_pakkaus_17.3.2010_Kartonkia lajitellaan ahkerasti, muovia ei>

2010/4 <Files\\HS_pakkaus_1.6.2010_Pakkausmateriaalit verolle>

2010/5 <Files\\HS_pakkaus_1.6.2010_Muovia olisi kierrätettävä luovasti>

2010/6 <Files\\HS_pakkaus_5.7.2010_Jätelakia uudistetaan ympäristöstä piittaamatta>

2010/7 <Files\\HS_pakkaus_28.7.2010_Tom Pesch on suunnitellut kierrätyspaperista...>

2010/8 <Files\\HS_roska ja muovi_31.7.2010_Jätteitä ei yleensä saa polttaa takassa>

2010/9 <Files\\HS_pakkaus_2.8.2010_Jätehuoltovastuu on pidettävä kunnilla>

2010/10 <Files\\HS_ruokajäte_22.9.2010_Arviolta joka neljäs ruokakassillinen heitetään roskakoriin>

2010/11 <Files\\HS_pakkaus_12.10.2010_Pieniä hippuja, suuria ongelmia>

2010/12 <Files\\HS_pakkaus_16.10.2010_Yritysten pitää kerätä pakkausjätteensä kuluttajilta>

2010/13 <Files\\HS_pakkaus_28.11.2010_Kevyttä ja kestäväää nanosellusta>

2011

2011/1 <Files\\HS_pakkaus_7.1.2011_Pienetkin kerrostalot pahvinkerääjiksi>

2011/2 <Files\\HS_pakkaus_31.1.2011_Kierrättävä lukiolainen on perheen omatunto>

2011/3 <Files\\TT_pakkaus_8.3.2011_Kierrätyskartonkipakkaus voi myrkyttää aamiaismurosi>

2011/4 <Files\\TT_pakkaus_9.3.2011_Ruokapakkausten mineraaliöljyjäämiä selvitetään laissa ei ole määrärajoituksia>

2011/5 <Files\\HS_pakkaus_20.3.2011_Kuluttajalla liikaa vastuuta kierrätyksestä>

2011/6 <Files\\HS_pakkaus_3.7.2011_Ruoan ekokuormaa on yhä vaikea punnita>

2011/7 <Files\\HS_pakkaus_18.8.2011_Älypakkaus ilmoittaa pilaantumisesta...>

2011/8 <Files\\HS_ruokahävikki_29.8.2011_Tutkimus Ruoan hävikki rasittaa luontoa pakkausta enemmän>

2011/9 <Files\\HS_pakkaus_13.10.2011_Kuluttaja haluaa ekologisen pakkauksen>

2011/10 <Files\\HS_pakkaus_26.10.2011_Kysymyksiin vastaa>

2012

2012/1 <Files\\HS_pakkaus_5.1.2012_Muovipakkausten keräystä kokeillaan pilotilla>

2012/2 <Files\\TT_pakkaus_20.1.2012_Miksi uusiutuva kuitu korvautuu muovilla>

2012/3 <Files\\TT_pakkaus_23.1.2012_Koivufibrillisellusta syntyy muovin kaltaista pakkausmateriaalia>

2012/4 <Files\\HS_ruoka ja muovi_2.2.2012_Lisää muovi- ruokaa~>

2012/5 <Files\\HS_ruoka ja muovi_3.3.2012_Kuolleen kirahvin vatsasta löytyi 20 kiloa muovia>

2012/6 <Files\\TT_pakkaus_22.11.2012_Kestää paremmin, mutta maatuu nopeammin>

2013

2013/1 Files\\HS_pakkaus_16.5.2013_Suomalainen heittää vuodessa 80 euron edestä ruokaa roskeen>

2013/2 <Files\\HS_pakkaus_3.6.2013_Maitotölkkien ahtamisennätys~ 22>

2013/3 <Files\\HS_pakkaus_28.11.2013_Jätelain uudistus viivästyy – kierrätyspisteiden määrä hiertää yhä>

2014

2014/1 <Files\\HS_pakkaus_19.2.2014_Brittitutkijat huolissaan ruokapakkauksista irtoavista kemikaaleista>

2014/2 <Files\\HS_pakkaus_2.7.2014_EU~n tiukat jätetavoitteet haastavat huonosti kierrättävän Suomen>

2014/3 <Files\\KL_pakkaus_4.7.2014_ETL Kierrätysasetus näkyy ruuan hinnassa>

2014/4 <Files\\TT_pakkaus_4.7.2014_Kuntien velvollisuudet vähenevät edes tässä>

2014/5 <Files\\HS_ruokajäte_20.7.2014_10 kierrätysvirhettä, jotka lähes kaikki tekevät>

2014/6 <Files\\HS_roska ja muovi_29.8.2014_Ajautuuko muovia Itämerestä roskapyörteisiin>

2014/7 <Files\\HS_pakkaus_25.9.2014_Muovin kierrätys on askel kohti kierrätysyhteiskuntaa>

2014/8 <Files\\HS_pakkaus_27.9.2014_Uudenlainen pakkaus osaa kertoa, onko ruoka ehtinyt pilaantua>

2014/9 <Files\\TT_pakkaus_17.10.2014_Hyvästöt muovipakkauksille>

2014/10 <Files\\HS_pakkaus_19.12.2014_Tiedätkö, mitä tehdä lahjapapereille ja kinkun rasvalle~ – asiantuntija listasi viisi yleisintä virhettä joulujätteiden lajittelussa>

2015

2015/1 <Files\\HS_roska ja muovi_24.2.2015_Tutkimus Korallit ovat alkaneet syödä meren roskaa>

2015/2 <Files\\HS_pakkaus_28.4.2015_EU alkaa rajoittaa muovipussien käyttöä direktiivillä>

2015/3 <Files\\TT_pakkaus_18.5.2015_Prässätään pakkaukset paikan päällä>

2015/4 <Files\\HS_pakkaus_19.5.2015_Tanskalaiskauppa lopetti mikro-popcornin myynnin – ~Sisältävät hormonitoimintaa häiritseviä yhdisteitä~>

2015/5 <Files\\HS_pakkaus_22.6.2015_Miksi ruoka pakataan neutronipommin kestävään Barbien kahluualtaaseen~>

2015/6 <Files\\HS_pakkaus_7.7.2015_Kierrättäjien valikoima kasvaa~ Pääkaupunkiseudulla alkaa ensi vuonna muovin keräys>

2015/7 <Files\\HS_pakkaus_22.7.2015_Muovia ei kuulu heittää pian enää sekajätteeseen – kierrätys alkaa>

2015/8 <Files\\HS_pakkaus_23.7.2015_10 kysymystä muovinkeräyksestä – ensi vuonna ei enää sekajätteeseen>

2015/9 <Files\\HS_pakkaus_25.7.2015_Pakkausmuovivuori pienenee vähitellen>

2015/10 <Files\\HS_pakkaus_14.9.2015_Tutkija kehittää kuusesta syötäviä pakkauskalvoja ja toivoo niiden korvaavan valmisruokien muovipakkauksia>

2015/11 <Files\\TT_pakkaus_16.10.2015_Väitöstutkimus Ruoka kannattaisi säilyttää puussa>

2015/12 <Files\\HS_pakkaus_22.10.2015_Jätteiden kierrätys on yleistynyt odotettua hitaammin – ~Tilanne vaikeutumassa koko maassa~>

2015/13 <Files\\HS_pakkaus_23.11.2015_Kunnianhimoinen tavoite ei toteudu~ muovin keräys viivästyy useilla paikkakunnilla>

2015/14 <Files\\KL_pakkaus_26.11.2015_Kierrätysmateriaali ei sovi ruokapakkauksiin>

2015/15 <Files\\KL_pakkaus_26.11.2015_Stora Enso hakeutuu asiakkaan kylkeen>

2016

2016/1 <Files\\HS_pakkaus_17.2.2016_Energiajätepöntöt pian historiaan – kiinteistöiltä aletaan kerätä erikseen muovipakkauksia Helsingin seudulla>

2016/2 <Files\\HS_ruoka ja muovi_16.3.2016_Suomalaiset ovat maailman parhaita pullojen ja tölkkien kierrättäjiä – ”Nyt kuluttaja saa kehua itseään”>

2016/3 <Files\\TT_pakkaus_18.4.2016_Ensimmäistä kertaa maitopurkin voi nyt heittää biojätteeseen>

2016/4 <Files\\HS_ruokajäte_11.5.2016_Jätetutkijat löysivät sohvan purkillisen koiran hampaita ja toimivaa elektroniikkaa>

2016/5 <Files\\TT_pakkaus_20.6.2016_Kotkamills valmistautuu kartonkikoneen starttiin>

2016/6 <Files\\TT_pakkaus_1.8.2016_Pakkausmuovin keräyspisteitä nyt tavoitemäärä>

2016/7 <Files\\HS_pakkaus_22.8.2016_Maidon proteeinista valmistettu suojakalvo säilyttää ruoat paremmin kuin muovi.>

2016/8 <Files\\HS_pakkaus_25.8.2016_Jäte palaa energiaksi – yhdyskuntajätteen vieminen kaatopaikalle on loppunut muutamassa vuodessa>

2016/9 <Files\\HS_pakkaus_6.9.2016_Osaatko jo uudet, monimutkaisemmat jätteiden lajitteluohjeet~ Muovipakkaukset saivat omat astiat>

2016/10 <Files\\TT_pakkaus_15.10.2016_Yle Ruokakauppaan tulossa mullistus>

2017

2017/1 <Files\\TT_pakkaus_17.1.2017_Raportti merissä voi olla enemmän muovia kuin kalaa 30 vuoden kuluttua>

2017/2 <Files\\HS_muovi ja pakkaus_23.1.2017_Muovinkierrätyksen piti alkaa kunnolla viime vuonna mutta toisin kävi – tavoitteena viisi kiloa vuodessa jokaiselta suomalaiselta>

2017/3 <Files\\HS_pakkaus_29.1.2017_Suomi mielletään puhtaaksi maaksi, mutta tutkimustulos ei ollut mairitteleva>

2017/4 <Files\\KL_pakkaus_7.3.2017_Kertakäyttösadetakkisi voisikin olla maatuva maissia>

2017/5 <Files\\HS_roska ja muovi_19.3.2017_Olet juuri tehnyt elämäsi typerimmän ostoksen>

2017/6 <Files\\TT_pakkaus_20.3.2017_Idea kahvikuppiin pesuaineyhtiöltä>

2017/7 <Files\\HS_pakkaus_25.3.2017_Sadat miljoonat kuluttajat käyttävät Huhtamäen pakkauksia – ”Olemme tavallaan 20–30 vuotta kilpailijoita edellä”>

2017/8 <Files\\KL_muovi ja pakkaus_3.4.2017_Suomalainen pakkaus-innovaatio keräsi -miljoonarahoituksen>

2017/9 <Files\\HS_pakkaus_29.4.2017_Meri ei saa olla kaatopaikka>

2017/10 <Files\\HS_pakkaus_20.5.2017_Kauppatieteiden opiskelija havahtui turhanpäiväiseen kulutukseensa ja alkoi vältellä kaikkea muovin pakattua – nyt hän tekee jopa deodoranttinsa itse>

2017/11 <Files\\HS_pakkaus_8.6.2017_Muoviroska, ilmastonmuutos, liikakalastus, saasteet – maailman meriä koettelevat monet uhat>

2017/12 <Files\\TT_pakkaus_13.6.2017_Tietokonevalmistaja käyttää merten muoviroskaa pakkauksissa>

2017/13 <Files\\HS_pakkaus_2.7.2017_Jätteet kannattaa kierrättää kesän festareillakin, sillä suomalaisilla on vielä paljon parantamisen varaa>

2017/14 <Files\\HS_pakkaus_20.7.2017_Nyt se on laskettu~ maailmassa on tuotettu 8,3 miljardia tonnia muovia ja peräti puolet siitä kolmentoista viime vuoden aikana – silti tuotanto vain lisääntyy entisestään>

2017/15 <Files\\HS_pakkaus_24.7.2017_Viisilapsisen perheen äiti Aino Kämäräinen tekee itse hammastahnansa, välttää vihannespusseja ja elää heinäkuun ilman muovia – näin sinäkin voit vähentää muovijätettäsi>

2017/16 <Files\\HS_pakkaus_7.8.2017_Järkevä pakkaaminen vähentää ruokahävikkiä – lisääntyvät yhden hengen taloudet hyötyisivät pienemmistä kuluttajapakkauksista>

2017/17 <Files\\TT_pakkaus_16.10.2017_Suomalaiset kehittivät uudenlaisen pakkauksetonkin ensimmäisenä maailmassa>

2017/18 <Files\\KL_pakkaus_22.10.2017_Suomalainen pakkauksinovaatio sai alan arvostetuimman palkinnon>

2017/19 <Files\\HS_pakkaus_23.10.2017_Suomalaisten lajitteluinto laahaa pahasti tavoitteista~ Yli puolet kotien sekajätteestä on biojätettä tai kierrätyskelpoista muovia>

2017/20 <Files\\HS_pakkaus_18.11.2017_Suvi Haimi kypsyi muovijätteen määrään kylpyhuoneessaan – syntyi urauurtava keksintö, joka kiinnostaa jo kansainvälisiä kosmetiikkabrändejä>

2017/21 <Files\\TT_pakkaus_12.12.2017_Moni maa kieltää jo pakkaamasta ruokaa kierrätyskartonkiin>

2017/22 <Files\\HS_pakkaus_27.12.2017_Kierrätyspisteet muuttuivat surullisiksi roskavuoriksi, törkyä heitetään ylytymperiinsä jopa pusikoihin – ”Kyllä on masentava näky”>

2018

2018/1 <Files\\HS_pakkaus_3.1.2018_Inkeri Pekkanen on kerännyt viime huhtikuun jälkeen 11800 roskaa Hangon rannoilta – mitä ovat pikkuruiset muovipelletit, joita ei voi edes siivota~>

2018/2 <Files\\HS_pakkaus_15.1.2018_Kaatopaikalle menee enää murto-osa jätteistä – katso miten nopeasti polttaminen nousi hallitsevaksi jätteen käsittelytavaksi>

2018/3 <Files\\HS_pakkaus_16.1.2018_Muovi päätty mereen, kaloihin ja ihmisiin – EU haluaa, että kaikki muovi voidaan kierrättää tai käyttää uudelleen>

2018/4 <Files\\KL_pakkaus_19.1.2018_Hampurilaisjättilä pesee kasvojaan Kaikki pakkaukset vaihtuvat ympäristöystävällisemmiksi>

2018/5 <Files\\TT_pakkaus_19.1.2018_Hampurilaisjättilä näyttää suuntaa>

2018/6 <Files\\HS_pakkaus_23.1.2018_Törkyiset kierrätys-astiat tursuavat kaduille ja pusikoihin Helsingin ympäristössä – muovin kierrätyksestä tuli sekasotku>

2018/7 <Files\\TT_pakkaus_26.1.2018_Säätiö palkitsi VTTn muovittoman elintarvikepakkauksen>

2018/8 <Files\\HS_pakkaus_5.2.2018_Pitääkö jogurttipurkki pestä tai hedelmäpussin metalliosa irrottaa Asiantuntija vastaa yhdeksään kysymykseen muovin kierrättämisestä>

2018/9 <Files\\KL_muovi ja pakkaus_12.2.2018_Mielipide Kierrätys on hyvä tapa mutta uudelleenkäyttö>

2018/10 <Files\\HS_pakkaus_15.2.2018_Uusi jauhelihapaketti oli menestys ja vähensi muovin käyttöä – Elintarvikekonserni Atria teki aiempaa paremman tuloksen ja aloitti viennin Kiinaan>

2018/11 <Files\\KL_pakkaus_17.2.2018_Suomalaistutkijat perustivat startupin, joka taistelee turhaa muovia vastaan – Ajattelemme pakkauksia pidemmälle>

2018/12 <Files\\KL_pakkaus_19.2.2018_Voivatko biohajoavat pakkaukset korvata muovin>

2018/13 <Files\\KL_muovi ja pakkaus_27.2.2018_Muoviteollisuus on perhevetoista liiketoimintaa vain vähän>

2018/14 <Files\\TT_pakkaus_27.2.2018_Ainutlaatuinen suomalaisinnovaatio markkinoille>

2018/15 <Files\\KL_muovi ja pakkaus_1.3.2018_Ratkaisu muoviroskaan Pian rasvaiset>

2018/16 <Files\\HS_roska ja muovi_3.3.2018_Tuhannet yrittävät pärjätä maaliskuun ilman muovia>

2018/17 <Files\\HS_pakkaus_6.3.2018_Petteri Orpo väläyttää muoviveroa tai kertakäyttöisten muovituotteiden kieltoa>

2018/18 <Files\\HS_pakkaus_11.3.2018_Biohajoava muovi tulisi kieltää kuluttajilta jopa kokonaan, sanovat asiantuntijat – Ei ole ekologisempi ratkaisu tai vastaus ympäristöongelmiin>

2018/19 <Files\\HS_ruoka ja muovi_12.3.2018_Sillä on väliä, minkä kassin kaupassa valitset – yksittäisistä valinnoista muodostuu miljardien massa>

2018/20 <Files\\KL_roska ja muovi_14.3.2018_Liity kansanliikkeeseen, mutta älä viherpese>

2018/21 <Files\\KL_pakkaus_15.3.2018_Muoviteollisuus puolustautuu Lähtökohta on, ettei pakkauksesta siirry kuluttajaa vaarantavia ainemääriä>

2018/22 <Files\\KL_pakkaus_26.3.2018_Lidl lupaa leikata muovin määrää Ongelma ei ole materiaali vaan kertakäyttöisyys>

2018/23 <Files\\TT_pakkaus_27.3.2018_Lidl vähentää muovia pakkauksissa 20>

2018/24 <Files\\HS_pakkaus_27.3.2018_Merissä lilluva muovi on esimerkki modernista ongelmasta>

2018/25 <Files\\HS_pakkaus_2.4.2018_Monet paratiisirannat ovat saaneet muovikuorituksen ja vedessä lilluvat muovikääreet käyvät jo lomailijoidenkin hermoon – ”Varvastosuja, muovipulloja, hammasharjoja”>

2018/26 <Files\\HS_pakkaus_4.4.2018_Hollantilainen teini keksi kenties kunnian-himoisimman tavan puhdistaa valta-merten roska-pyörteet – suur-siivous alkaa tänä kesänä>

2018/27 <Files\\HS_roska ja muovi_7.4.2018_Maatuvatko biojäte-pussit ja minne laitan seka-jätteen>

2018/28 <Files\\HS_pakkaus_14.4.2018_Voisiko paperi pelastaa meidät muovilta>

2018/29 <Files\\HS_pakkaus_16.4.2018_Suomalaisen roskapussissa jopa 80 prosenttia on tavaraa, jonka voisi kierrättää – laiskimpia lajittelijoita ovat alle nelikymppiset>

2018/30 <Files\\HS_roska ja muovi_20.4.2018_Tienvarsilla näkyy erityisesti pahvimukeja ja pikaruokakääreitä>

2018/31 <Files\\HS_pakkaus_24.4.2018_Tutkijat löysivät ennätysmäärän mikromuovia Arktisen alueen merijästä>

2018/32 <Files\\HS_pakkaus_3.5.2018_Puu sulaa ja muovautuu – ihmeliuottimen avulla sellusta voidaan saada korvaaja sekä puuvillalle että muoville>

2018/33 <Files\\KL_pakkaus_3.5.2018_Kemiallinen kierrätys parantaisi muovista valmistettujen tuotteiden kiertoa>

2018/34 <Files\\HS_pakkaus_5.5.2018_Ikuinen ongelma>

2018/35 <Files\\TT_pakkaus_22.5.2018_Suomalainen pakkausinnovaatio kiinnostaa Stora Ensoa>

2018/36 <Files\\TT_roska ja muovi_23.5.2018_Roskat historiaan ja muovi kiertämään>

2018/37 <Files\\KL_pakkaus_29.5.2018_Suomalaisyritys pelastaa maailmaa muoviroskalta>

2018/38 <Files\\TT_pakkaus_29.5.2018_Ei muovia, fluorokemikaaleja tai vahoja>

2018/39 <Files\\HS_roska ja muovi_30.5.2018_Muovin korvaaminen avaa suomalaisille tilaisuuden>

2018/40 <Files\\TT_pakkaus_4.6.2018_Fazer ja Sulapac alkavat kehittää biohajoavia pakkauksia elintarvikkeille>

2018/41 <Files\\TT_pakkaus_11.6.2018_Uhka vai mahdollisuus Muovikiellot vaikuttavat Huhtamäen pakkausbisnekseen>

2018/42 <Files\\HS_pakkaus_21.6.2018_Helsingin uudet asuinalueet pääsevät osallistumaan muovin kierrätystalkoisiin>

2018/43 <Files\\HS_roska ja muovi_14.7.2018_Puutarhuri kyllästyi tupakantumppeihin uimarannalla>

2018/44 <Files\\HS_pakkaus_26.7.2018_Pikaruokapaikat tuottavat valtavan määrän roskaa>

2018/45 <Files\\TT_pakkaus_27.8.2018_Tässä ovat Meriroskahaasteen voittajat>

2018/46 <Files\\HS_pakkaus_3.9.2018_Turun Sinappi antoi opetuksen Unileverille – ”Teimme juuri niin kuin ei pitäisi tehdä”, sanoo Euroopan-johtaja>

2018/47 <Files\\HS_pakkaus_13.9.2018_Hollannissa avattiin maailman ensimmäinen kierrätysmuovista tehty pyörätie – 30 metriin tarvittu materiaali vastaa 218 000~ta mukia>

2018/48 <Files\\HS_pakkaus_27.9.2018_Brittien sipsi-pussi-protesti sai posti-laitoksen älähtämään – ihmiset vastustavat muovi-jätettä lähettämällä tyhjät pussit valmistajalle>

2018/49 <Files\\HS_pakkaus_1.10.2018_Hollantilainen kauppaketju nousi maailmanmaineeseen muovittomalla myyntikäytävällä – mutta ovatko muovin korvaajat oikeasti ympäristöystävällisiä~>

2018/50 <Files\\KL_pakkaus_17.10.2018_Raha on hyvä konsultti myös muovin käytössä>

2018/51 <Files\\HS_pakkaus_20.10.2018_Ruoan ilmastovaikutus on tähän asti arvioitua suurempi>

2018/52 <Files\\HS_roska ja muovi_24.10.2018_Ei enää muovihaarukoita, pillejä tai ilmapallon pidiketikkuja>

2018/53 <Files\\HS_pakkaus_26.10.2018_Muoviongelman ydin on tämä~ Pullot eivät kierrä, sillä uusi muovi on halpaa>

2018/54 <Files\\HS_pakkaus_26.10.2018_Suomalaiset innostuivat kierrättämään muovia – lähes kaikki keräys-muovi menee kotimaisille valmistajille uusiksi tiski-harjoiksi ja kastelu-kannuiksi>

2018/55 <Files\\HS_ruokajäte_11.11.2018_Me sen teimme>

2018/56 <Files\\HS_pakkaus_13.11.2018_Uudet materiaalit muistuttavat niin paljon muovia, että kuluttaja saattaa tehdä eko-teon huomaamattaan – Kaupan tuore-yrtit pääsevät pian puu-pohjaiseen, läpinäkyvään pakkaukseen>

2018/57 <Files\\KL_pakkaus_13.11.2018_Kestävän kehityksen uusi steppi Puupohjainen pakkauskalvo muovia korvaamaan>

2018/58 <Files\\HS_roska ja muovi_19.11.2018_Muovinpalasia löytyi jo Amazonin piraijoistakin>

2018/59 <Files\\HS_pakkaus_20.12.2018_Pääkaupunkiseudulle tulee kymmenen uutta pakkausmuovin kierrätyspistettä>

2018/60 <Files\\KL_muovi ja pakkaus_31.12.2018_Hesburger luopuu muovipilleistä>

2019

2019/1 <Files\\HS_pakkaus_8.1.2019_Riitta Pesola suivaantui mustista muovi-pakkauksista, sillä niitä ei voi kierrättää – Suostuvatko liha-yritykset luopumaan mustasta, vaikka liha näyttää siinä parhaalta~>

2019/2 <Files\\KL_pakkaus_11.1.2019_Kemisti huolestui sarjakeksijän pahvipullon turvallisuudesta ”Sellaista materiaalia ei olekaan, mistä ei jotain ruokaan joutuisi”>

2019/3 <Files\\HS_pakkaus_17.1.2019_Pakkausmuovit torjuvat ruokahävikkiä>

2019/4 <Files\\HS_pakkaus_1.2.2019_Sinituote tekee vessaharjoja muovisista jauheliha-pakkauksista – Suomala>

2019/5 <Files\\TT_pakkaus_7.2.2019_Suomalaisyritys esittelee parempaa pakkaamista taittelun taiteella>

2019/6 <Files\\TT_pakkaus_20.2.2019_Suomen jätelait menevät uusiksi - eniten ongelmia aiheuttavat muovi- ja puupakkaukset>

2019/7 <Files\\TT_pakkaus_28.2.2019_Suomalaisyhtiö kokeilee Kemiallisesti kierrätetyt polymeerit tulevat pakkauksiin>

2019/8 <Files\\HS_roska ja muovi_18.3.2019_Kuolleen hanhennokka-valaan vatsasta löytyi 40 kiloa>

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2019/10 <Files\\HS_pakkaus_29.4.2019_Tutkimus Biomuovista tehty kassi oli käyttökunnossa vielä kolmen vuoden hautaamisen jälkeen>

2019/11 <Files\\HS_roska ja muovi_16.5.2019_Syrjäisten Kookos-saarten rannoilta löytyi 414 miljoonaa muovin-palasta>

2019/12 <Files\\KL_pakkaus_4.6.2019_Brittiläinen kauppajätti karsii rajusti pakkauksia – kannustaa asiakkaita tuomaan omat pussukkansa>

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2019/14 <Files\\KL_muovi ja pakkaus_10.6.2019_Kaupan liitto hiiltyi Rinteen hallitusohjelmaan kirjatusta>

2019/15 <Files\\HS_pakkaus_13.6.2019_Osa Suomenkin muoviroskista valuu Aasiaan, jossa maa toisensa jälkeen on saamassa vyörystä tarpeekseen Asiantuntija ennustaa jätesotaa>

2019/16 <Files\\HS_roska ja muovi_3.7.2019_Maailma tuottaa vuodessa 2.1 miljardia tonnia yhdyskuntajätettä>

2019/17 <Files\\HS_pakkaus_7.7.2019_Muoviroskavuoren päällä killuva taiteilija pitää kymmenen tunnin mittaisen saarnan Helsingin keskustassa>

2019/18 <Files\\TT_pakkaus_13.8.2019_Kansainvälinen kysely pakkauksista Kuluttajille on tärkeää ettei ruokapakkaus>

2019/19 <Files\\HS_pakkaus_20.8.2019_Kierrätys-kelvottoman mustan muovin käyttö vähenee~ Saarioinen luopuu mustista valmis-ruoka-pakkauksista>

2019/20 <Files\\HS_pakkaus_25.8.2019_Kierrätettävän muovinkorvikkeen toivotaan pelastavan Itämeren roskaantumiselta>

2019/21 <Files\\HS_pakkaus_26.9.2019_Stora Enson uusi toimitus-johtaja Annica Bresky saa eteensä synkkenevän maailman, mutta hänellä on myös onnea matkassa>

2019/22 <Files\\TT_pakkaus_15.10.2019_Vihreys käy kaupaksi pakkausmarkkinoilla pakkauksen pitää olla sellainen>

2019/23 <Files\\HS_pakkaus_23.10.2019_Maailman muoviroskasta suuri osa on peräisin vain muutaman suuryhtiön tuotteista – ykkösenä Coca-Cola>

2019/24 <Files\\HS_pakkaus_17.11.2019_Ei jätä kylmäksi>

2019/25 <Files\\KL_pakkaus_18.11.2019_Ruokapakkaus viestii vastuullisuudesta ”Aito vastuullisuus edellyttää sekä hyviä tekoja että hyvää viestintää”>

2019/26 <Files\\HS_pakkaus_18.11.2019_Miten kaupat ja ravintolat hoitavat biojätteensä Revitäänkö kaikki vanhentuneet ruokapakkaukset oikeasti auki>

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2019/28 <Files\\HS_roska ja muovi_27.11.2019_Thaimaalainen kansallispuisto vaatii roskaamisen lopettamista>

2019/29 <Files\\HS_roska ja muovi_28.11.2019_Minna Mäkinen käyttää elämästään satoja tunteja>

2019/30 <Files\\HS_pakkaus_8.12.2019_Keskustelu muovista saa kuluttajat pohtimaan ostoksiaan, mutta näkyykö se joulukaupassa~>

2019/31 <Files\\KL_pakkaus_10.12.2019_Stora Enso investoi biopakkausmuoviin keskittyvään pilottilaitokseen>

2020

2020/1 <Files\\HS_pakkaus_15.1.2020_Suomalaiset tuottivat ennätysmäärän jätettä, paljastavat Tilastokeskuksen uusimmat luvut – ”Vastaavaa kasvua ei ole aiemmin nähty”>

2020/2 <Files\\TT_pakkaus_20.1.2020_Näin kiertää muoviton kahvikuppi kierrätys uudeksi elintarvikepakkaukseksi>

2020/3 <Files\\HS_pakkaus_21.1.2020_McDonald’s, Burger King ja monet muut pikaruokat eivät lajittele roskiaan, ja syyllisiä ovat yhtiöiden mukaan asiakkaat>

2020/4 <Files\\HS_pakkaus_30.1.2020_Muovi kiertoon>

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2020/6 <Files\\HS_pakkaus_16.2.2020_Hallitus riitelee yhä jätelaista, vaikka jo kesällä jätteiden kierrätyksen pitäisi tiukentua merkittävästi>

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2020/12 <Files\\HS_ruoka ja muovi_10.5.2020_Pysäyttävä näky Kaivopuistossa~ Roska-astiat tulvivat, koska kaikki syövät noutoruokia – Koronan luoma ilmiö voi johtaa siihen, että jätteiden lajittelutapa mullistuu Helsingissä>

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2020/15 <Files\\HS_pakkaus_11.6.2020_Muovipakkausten keräys on taloyhtiöille kannattavaa>

2020/16 <Files\\HS_ruoka ja muovi_13.6.2020_Mereen päätyneestä muovista tuli kansain-välinen ongelma – Nyt tutkijat kertovat, miksi muovin käytön kieltäminen olisi ympäristön kannalta järjetön ajatus>

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2020/19 <Files\\HS_pakkaus_7.7.2020_Suosittu kierrätyspiste jyrättiin talojen tieltä Koillis-Helsingissä – Nyt asukkaat ovat odottaneet vuoden ajan tietoa, minne jätteet pitäisi viedä>

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2020/21 <Files\\HS_pakkaus_1.8.2020_EU~n kiistelty muovi-maksu tulee voimaan ensi vuoden alussa – ”Tämä on Suomen kannalta hyvä ratkaisu”, sanoo Tytti Tuppurainen>

2020/22 <Files\\HS_pakkaus_19.8.2020_EU~n muovimaksu tarjoaa tehokkaan ohjaukskeinon kierrätyksen edistämiseksi>

2020/23 <Files\\HS_pakkaus_19.8.2020_Tutkimus~ Mikromuovia voi olla Atlantin valtameressä paljon aiemmin arvioitua enemmän>

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2020/28 <Files\\HS_pakkaus_15.11.2020_Mihin jäteastiaan kuuluu kumimainen viinipullonkorkki, entä muovia ja alumiinia sisältävä pilleripakkaus~ 15 väittämää jätteiden lajittelusta>

2020/29 <Files\\TT_pakkaus_18.11.2020_Mitä paperin tilalle~ Suomalaisesta puusta kehitetään nyt kovaa vauhtia akkumateriaaleja, vaatteita, pakkauksia ja jopa lavuaareja>

2020/30 <Files\\HS_pakkaus_28.11.2020_Pakkausjätteiden tuottajavastuuta koskeva uudistus on valmisteltava uudelleen>

2020/31 <Files\\KL_pakkaus_4.12.2020_Stora Enson Annica Bresky~ ”Skoghall on yksi kannattavimmista tehtaista, joita meillä on”>

2020/32 <Files\\KL_pakkaus_6.12.2020_Olisiko Kaipola voitu pelastaa~ Uudet pakkausmateriaalit siivittävät suomalaisia paperitehtaita tulevaisuuteen>

2020/33 <Files\\HS_pakkaus_7.12.2020_Ympäristöliike~ Coca-Cola, Pepsi Co ja Nestlé pahimmat muovisaastuttajat jo kolmen perättäisen vuoden ajan>

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