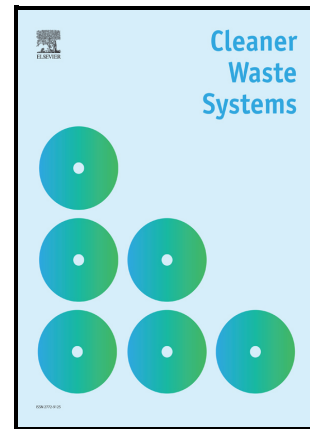


A review of factors reducing waste in the food supply chain: the retailer perspective

Barbara Flores Pimentel, Fotios Misopoulos,
Jennifer Davies



PII: S2772-9125(22)00028-8

DOI: <https://doi.org/10.1016/j.clwas.2022.100028>

Reference: CLWAS100028

To appear in: *Cleaner Waste Systems*

Received date: 18 March 2022

Revised date: 17 July 2022

Accepted date: 22 August 2022

Please cite this article as: Barbara Flores Pimentel, Fotios Misopoulos and Jennifer Davies, A review of factors reducing waste in the food supply chain: the retailer perspective, *Cleaner Waste Systems*, (2022) doi:<https://doi.org/10.1016/j.clwas.2022.100028>

This is a PDF file of an article that has undergone enhancements after acceptance, such as the addition of a cover page and metadata, and formatting for readability, but it is not yet the definitive version of record. This version will undergo additional copyediting, typesetting and review before it is published in its final form, but we are providing this version to give early visibility of the article. Please note that, during the production process, errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

© 2022 Published by Elsevier.

A review of factors reducing waste in the food supply chain: the retailer perspective

Barbara Flores Pimentel^a, Fotios Misopoulos^a, Jennifer Davies^{a*}

^a*University of Liverpool Management School Chatham Street Liverpool England L69 7ZH*

^{*}*Corresponding author - Jennifer.Davies@liverpool.ac.uk*

Abstract

This research unifies previous studies and provides a critical review of the factors affecting the volume of food waste across food supply chains from a retailer perspective. Particularly, it focusses on analyzing the positive factors that contribute to the reduction of food waste. A systematic review was employed using a combination of methods including the three macro-stages (planning the review, conducting the review, and reporting and dissemination) and the PRISMA statement. As a result, 175 journal articles were selected, and the influences identified are analyzed from the angle of the Triple Bottom Line (TBL) and the Organizational theory. The search yielded forty-four unique factors that help reduce food waste. These were grouped into twelve broader categories and further classified under the three dimensions of the macro-environment, the microenvironment, and the internal environment of the retail organization. Food retailers occupy a unique position to drive other members across the supply chain (SC) to reduce food waste. The research contributes to the waste food body of knowledge and can help to guide the decisions of both retailers and stakeholders seeking to reduce food waste in the SC.

Keywords: Food waste factors, Sustainability, Food retail stores, Organizational theory, Food Supply Chain.

1. Introduction

As the world becomes aware of the deterioration of the planet and its limited resources, the urgency to reduce food waste continues to grow among different actors, including business enterprises, non-governmental organizations (NGOs), policy makers, and the general public. According to Scherhauser et al. (2018) a harmonization in the definition of the term “food waste” is required to facilitate actions for food waste management, including the quantification of food waste data, the development of metrics, and the comparison between investigations on this field (Schneider, 2013; Östergren et al., 2014). The Food and Agriculture Organization of the United Nations (FAO, 2019) defines food waste as the “decrease in the quantity or quality of food resulting

from decisions and actions by retailers, food service providers and consumers". One of the important goals in the United Nations (UN) 2030 Agenda is to reduce food waste by 50% at the retail and consumer levels (UN General Assembly, 2015). The circular economy plan of the European Union (EU) includes a commitment of a 30% reduction in food waste by 2025 and a 50% reduction by 2030 (European Commission, 2018). An estimate of the FAO in 2011 established that around one-third of the food produced in the world is wasted and wastage occurs in every stage of the food supply chain (FSC) generating negative environmental, social and economic impacts (FAO, 2019). The United Nations highlighted the vital role that reducing food waste will play in tackling world hunger and fighting climate change. The UN's Intergovernmental Panel on Climate Change (IPCC) estimated that between 8 and 10% of the world's CO₂ emissions in the period 2010 to 2016 can be traced back to food wastage (United Nations, 2020). However, there is a lack of awareness about the link between food waste and environmental impacts (Schanes et al., 2018).

The perspective of retailers on sustainability has received limited attention and ignored in the literature, particularly in developing economies contexts (Naidoo and Gasparatos, 2018). Trends in publications over the years showed that the perspective of retailers on food waste factors has been recently incorporated into FSC research with very limited literature before the year 2014 (Moraes et al., 2020; Özbük and Coşkun, 2020). The systematic literature review (SLR) of Özbük and Coşkun (2020) indicated that limited attention was paid to understanding causes of food waste at the downstream entities, and Moraes et al. (2020) claimed that there is no SLR study that maps the causes of food waste or practices for food waste reduction in a supply chain framework. The FSC can be defined as the complex group of activities from production, processing, packaging, distribution, retail to consumption in which different actors are interrelated and where each of their decisions can influence the whole chain (Nosratabadi et al., 2020; Ingram et al., 2013). Retailer perspectives on food waste are still underexplored and as Cicatiello et al. (2017) observe, the issue has been neglected for long. The consumption stage of the FSC has received greater attention in academic reviews (Chauhan et al., 2021), likely due to the large amount of food waste generated in households. In the EU, retailer food waste accounted for a small portion (5%) of the total food waste throughout the food chain, while the largest food waste was generated by households (42%), followed by manufacturers (39%) (Cicatiello et al., 2016). Strategies and actions to reduce food waste in the supply chain require a cooperation of multiple stakeholders (Teller et al., 2018; Aschemann-Witzel et al., 2015; Wang et al., 2019), although Cicatiello et al. (2017) speculate that retailers are more inclined to seek ways to scale down food waste compared to other stakeholders of the food supply chains, due to their narrow profit margins. Recent studies have indicated that food retailers due to their close connection to other stages and actors in the food supply chain (FSC) have greater potential than other actors to influence food waste behaviors and produce significant reductions (Young et al., 2018; Naidoo and Gasparatos, 2018; Swaffield et al., 2018).

The impact of retailers on reducing the supply chain food waste is potentially much greater than a large number of consumers, with varying characteristics, who individually may not make a big difference to food waste reduction (Gruber et al., 2016). Research suggested that the purchasing power of large retailers can contribute to the legitimacy of sustainable practices across the supply chain (Kor et al., 2017; Sustainable Development Commission, 2008). On the contrary, Glover et al. (2014) and Wu et al. (2012) indicated that retailer purchasing power might also have negative impacts and costs for small companies that prevent and limit their ability to reducing food waste. For example, when quality standards are too high, it forces suppliers to waste imperfect foods; when retailers return unsold foods, they are transferring the financial responsibility to suppliers. Moreover, the study of Ghosh and Eriksson (2019) unveiled the negative effects of take-back agreements between powerful retailers and smaller bread suppliers in Sweden. They caused some of the suppliers to go out of business after having to incur the cost of returned quantities. In one case, this reached an average of thirty percent of the total volume produced within a five-year period. The negative effects of take-back agreements were also observed by Eriksson et al. (2017) not only on

bread suppliers, but also on fresh fruit and vegetable and milk suppliers, although there were fewer rejections in these two food categories compared to bread returns. Prevention of food waste across the FSC is the most advantageous solution, followed by reuse, recycling and recovery before its final disposal (Bilska et al., 2018; Ocicka and Raźniewska, 2018). In addition to reducing the environmental impacts, there is a great opportunity for cost savings through the reduction of food waste. The study of Venkat (2011) indicated that retail organizations in the United States lost about \$65 billion a year as a result of the food they wasted. The reduction of food waste through charity donations has additionally important contributions to reputation and brand value of retail organizations (Bilska et al., 2018; Swaffield et al., 2018).

According to Chkanikova and Mont (2015) academic research on influences of sustainability in the supply chains of retailers is lacking and in order to assist the retail business, it is important to provide an understanding of the factors influencing food waste. Research suggests that food waste factors need to be integrated by a conceptual approach with different exploratory theories that provide valuable practical insights (Özbük and Coşkun, 2020). Particularly, macro-environmental factors were the least addressed in the literature, even though their effects are more extensive on an organization (Özbük and Coşkun, 2020). Studying the factors that impact food waste is important to assist both retailers and stakeholders to prevent food waste in the supply chain. According to Moraes et al. (2020) the literature on food waste is still fragmented because most of the studies addressed individual issues, such as isolated causes, initiatives and the quantification of certain products wasted. Previous research on food waste in the retail sector has mainly focused on the quantification of waste (Scholz et al., 2015), which is not part of the scope of this study.

The purpose of this paper is to unify the current literature and develop a categorization of the factors incorporating mature concepts and theories with solid foundations, such as the Triple Bottom Line (TBL) and organizational theory, and to critically analyze from the retailer's perspective all factors that can help reduce the volume of food waste in the supply chain. The TBL concept is urgently needed to be incorporated in the food supply chain and it covers the three goals of sustainability, social, environmental and economic (Glover et al., 2014; Govindan, 2018). To better identify and group the influences, the organizational theory as used by Özbük and Coşkun (2020) is applied, which consists of three dimensions where those influences exist: macro-environment, microenvironment and the internal environment of the organization. The study helps develop a comprehensive understanding to guide those seeking to reduce food waste. In achieving this, the first objective is to analyze the extent to which the food waste topic in the retail sector has been investigated, and the second objective is to identify and critically review the factors impacting food waste at the retail stage, with a concentration on those that reduce it.

2. Theoretical lenses

Although the food waste factors in this research were analyzed considering the economic, social, and environmental organizational goals of sustainability, the organizational theory, as used by Özbük and Coşkun (2020), is also applied to better identify and group the factors. The organizational theory was defined by Jones (2013) as “the study of how organizations function and how they affect and are affected by the environment in which they operate”, (p.7). As the environment is characterized of being complex, uncertain and changing (Basil, 2018; McAuley et al., 2007), business managers have the challenging task of identifying in advance the influences arising from this dynamism in the environment to ensure the survival of the organization and the success of the business. The theory suggests that influences exist among three environments of the

organization: macro-environment, microenvironment and internal environment. The macro-environment, also called as general environment, conforms external influences coming from the economy, society, technology and politics, which are general for organizations in different industries and from which the organization can obtain inputs (Jones, 2013; Basil, 2018). Those influences are beyond the control of the organization, but business managers can anticipate them. The microenvironment or specific environment comprise external influences that are specific to the business and can include customers, competitors, suppliers, and other external stakeholders affecting the organization in the specific industry. From the microenvironment, organization managers can gain a more accurate understanding of opportunities and threats for business decisions. Lastly, in the internal environment the influences are found within the organization and include internal stakeholders, such as employees and managers, structure, culture, strategy, and all operations (Jones, 2013; Basil, 2018). The findings of the present research incorporate this theory to group and classify the influences found in the literature, which contribute to decision-making.

3. Methodology

Systematic Literature Reviews (SLRs) play an important role in developing knowledge in Supply Chain Management (SCM) (Moraes et al., 2020). A SLR provides comprehensive understanding and generates research knowledge by interpreting key findings and identifying areas for development in the relevant literature (Özbük and Coşkun, 2020). SLR offers rigor to the research and highlights opportunities for future research (Schanes et al., 2018). It can also aid practitioner understanding of management problems, as most of the studies on food waste are empirical and very few are conceptual (Özbük and Coşkun, 2020). The nature of an SLR, as a conceptual method, lies in its ability to address questions on a broader frame than individual empirical studies (Bloomberg and Volpe, 2018) which can provide useful managerial guidelines.

The order of steps and combination of methods employed on this paper are based on the systematic review approach proposed by Denyer and Tranfield (2009), the three macro stages proposed by Tranfield et al. (2003), and the PRISMA methodology provided by Moher et al. (2009). The full process is illustrated in Figure 1. The first stage comprises the sequence of steps and methods for scoping and planning the review, the second stage is the conduction of the review through data collection and the third stage is the reporting and dissemination of the results obtained.

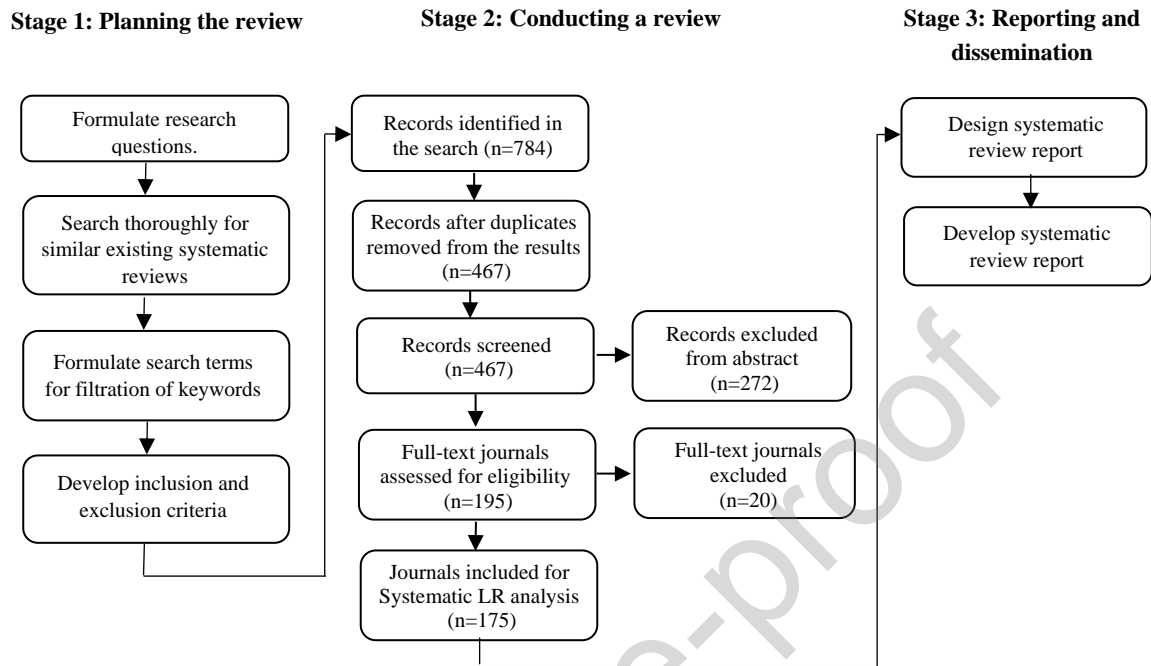


Figure 1. Search process

3.1. Stage 1: Planning the review

Planning the review was the first stage for carrying out the research as it started from assessing existing literature reviews and formulating relevant research questions to guide the study and the SLR process. It also confirmed the originality of the current research. Appropriate keywords were selected to search relevant articles covering the aim of the study. These keywords were truncated and combined to conduct a search string in titles and abstracts: (supermarket* OR retail*) AND (sustain* OR green*) AND (food waste* OR food loss*).

Table 1. Inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Type of publication	Peer-reviewed academic articles	No peer-reviewed articles
Publication date	2010-2020	Prior to 2010
Language	English	Non-English
Triple Bottom Line	Articles with environmental, social and economic perspectives.	Articles not referring to TBL
Particular topics	Articles with a focus on food waste, food retailers, and influences of food waste.	Articles not discussing any of these topics.

3.2. Stage 2: Conducting the review

The second stage consisted of the execution of the data-collection process by firstly searching electronic databases. The PRISMA methodology was applied to evaluate the articles obtained from the search through a screening and sifting process until determining the studies included for systematic review analysis. The search yielded 784 academic articles from which duplicates were removed to continue the selection process.

The inclusion criteria were applied consistently to assure the quality and uniformity of included studies throughout the systematic review process. Articles that did not meet the inclusion criteria were excluded from the review. The screening was carried out by reading the titles and abstracts and the articles that passed the screening went through the sifting process, a full-text assessment to make sure the studies selected were indeed adequate for review analysis. After an exhaustive review process 175 articles were finally included in the systematic review. Table 2 shows the list of databases from where the selected articles were obtained and the number of publications before excluding duplicates.

Table 2. Databases searched – Eligible articles (including duplicates)

Databases Obtained	Number of publications
Scopus	143
ScienceDirect	55
Directory of Open Access Journals	39
Social Sciences Citation Index	20
Business Source Complete	20
Gale Academic OneFile	19
Science Citation Index	17
Springer Nature Journals	8
SwePub	7
Complementary Index	7
Supplemental Index	6
Academic Search Complete	6
Environment Complete	6
Agricola	6
Emerald Insight	5
JSTOR Journals	3
MEDLINE	2
EconLit	2
Index to Legal Periodicals & Books Full Text (H.W. Wilson)	1
CINAHL Plus	1
Business Source	1
Humanities International Complete	1
British Library Document Supply Centre Inside Serials & Conference Proceedings	1
Social Sciences	1

3.3. Stage 3: Reporting and Dissemination

Due to the qualitative nature of the data and the objectives of the study, a qualitative approach was deemed appropriate to analyze and synthesize the relevant data from the included academic articles. A qualitative approach is applicable for those research questions that seek to provide an understanding, particularly useful for organizations and management processes (Tranfield et al., 2003). All information that was considered relevant to address the research objectives was extracted during the screening and sifting of the articles, analyzed and synthesized, comparing information between individual studies to develop knowledge. The characteristics of the articles included in the systematic review were analyzed to address the first objective of the study. Regarding the second objective, factors impacting the volume of food waste in the FSC were identified and analyzed according to each environment of the organizational theory and the TBL. Finally, the report of the results was carried out and discussed in the following section.

4. Findings and Discussion

4.1. Characteristics of the articles reviewed

The results in Figure 2 show that there has been an increasing interest in the field that started peaking since 2017. Those findings are similar to the results of Moraes et al. (2020) and Özbük and Coşkun (2020) who investigated factors affecting retail food waste.

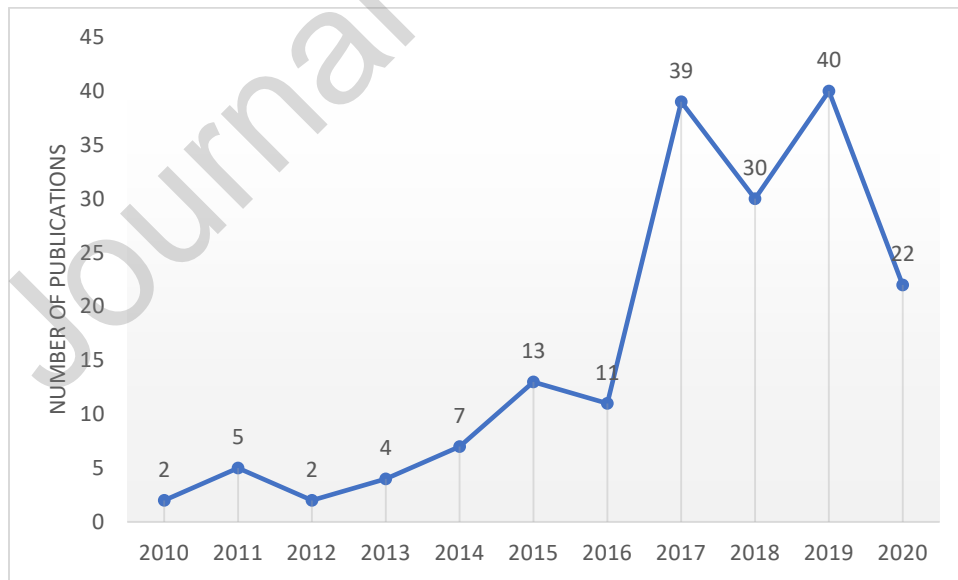


Figure 2. Publications on food waste in the retail chain during the investigated period

The attention received from different academic journals was also included in the analysis. The 175 articles selected in the review cover 95 different journals from different disciplines which investigated the topic of food waste and retailers. Table 3 shows the top 10 journals which provided 75 of the total number of publications included in the systematic review.

Table 3. Top ten journals ranked by the number of publications

	Academic Journals	Number of publications
1	Sustainability	24
2	Journal of Cleaner Production	18
3	Resources, Conservation and Recycling	10
4	Waste Management	7
5	Sustainable Production and Consumption	3
6	Food Policy	3
7	British Food Journal	3
8	International Journal of Consumer Studies	3
9	International Journal of Production Economics	2
10	Management Science	2

The types of retail stores addressed by each of the articles were thoroughly analyzed and groups were created to distribute them (Figure 3). Supermarkets were the most investigated type of retail store, followed by grocery stores, which mainly differ from supermarkets in terms of scale by selling products in less quantity than supermarkets and typically in specialized food categories or targeted demographic. Eleven articles investigated non-conventional retailers, including family-owned retail stores, zero-packaging stores, non-profit stores, social supermarkets, bazaars and outdoor farmers' markets. Two articles were found covering online retail format in their analysis, those of Belavina et al. (2017) and Borsellino et al. (2020). In the latter, various other types of retail stores were also addressed and therefore, Figure 3 below shows only one article addressing exclusively online retailers.

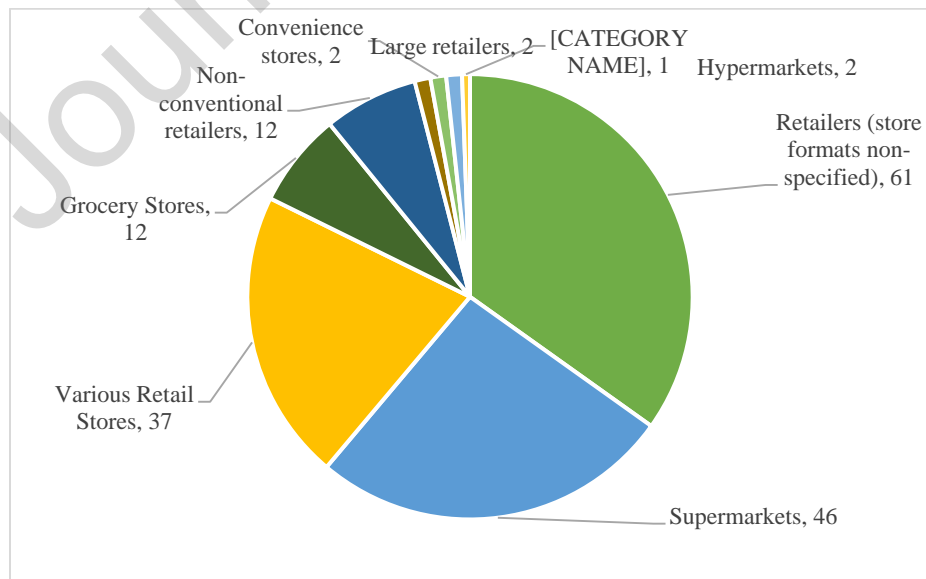


Figure 3. Types of retail stores and number of corresponding publications

The geographical scope of the articles was analyzed to explore the concentration of research. In terms of regions, the analysis showed that the region of Europe had the highest concentration of research on the topic of food waste and retailers compared to other territories, followed by North America, Asia, Africa and Oceania and lastly South America. In terms of countries, the top 5 countries with the highest number of publications were the United Kingdom, United States, Italy, Sweden, followed by Germany and Poland in the 5th place (Figure 4). Some reasons might explain why the largest number of publications was focused on these countries, one of them being that food waste represents one of the biggest environmental issues in the European Union (EU), particularly in Sweden and the UK (Yngfalk, 2019), also, due to the increasing awareness and concerns about environmental impacts in European countries.

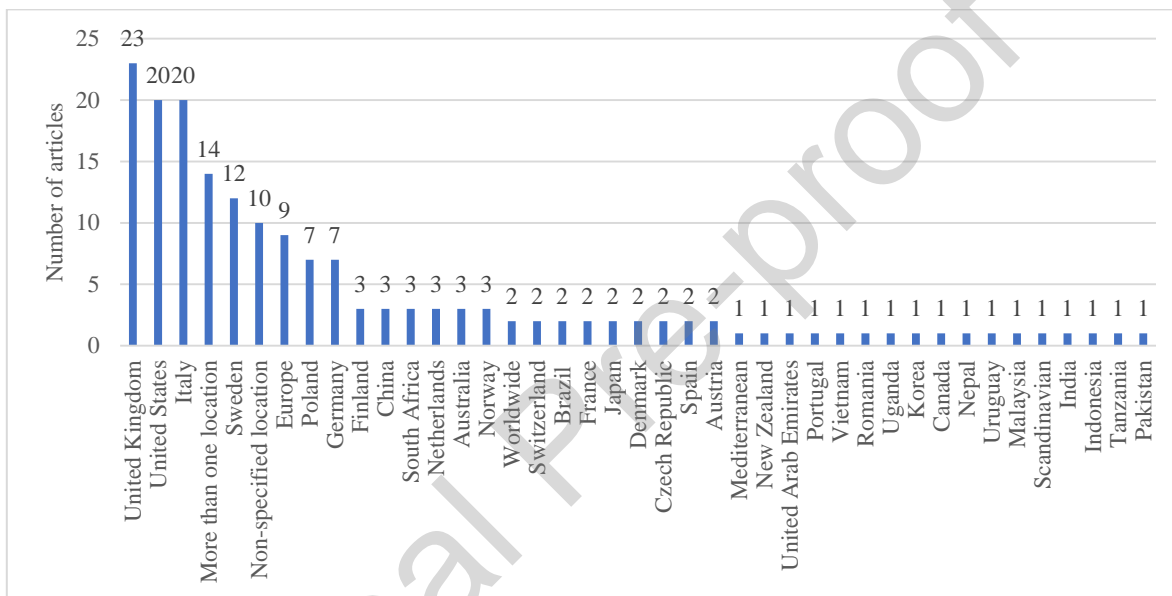


Figure 4. Number of publications focusing on a geographical region (n=175)

4.2. Positive factors in the Macro-environment

This section discusses how regulatory, sociocultural, environmental, technological, and economic influences found in the macro-environment can contribute to food waste reduction. Technological trends are introduced and discussed in this review, which adds to the influences found in Özbük and Coşkun (2020). All factors are presented in Table 4.

4.2.1. Regulatory

Governments play a determining role in reducing food waste. They can supervise food waste management in organizations (Kazimierowicz, 2018), make the issues more visible and increase societal awareness (Campbell et al., 2017; Xue et al., 2019). They can also help to distribute the responsibility for food waste reduction among the actors of the FSC (Maye et al., 2019; Lombardi and Costantino, 2020; Cantaragiu, 2019) and help to facilitate collaboration between food operators, such as retailers and food banks (Lombardi and Costantino, 2020; Cantaragiu, 2019). Self-regulation in the industry is largely dependent on the will of organizations and findings highlight that it is more effective when self-regulation is supported by a political framework (Audet and Brisebois, 2019; Bobe and Dragomir, 2020). Environmental regulations exert pressure to reduce food waste in the industry by supporting responsible behaviors and sanctioning actions that threaten the environment through mechanisms such as tax benefits for retailers that donate excess produce

(Lee and Tongarlak, 2017), funds for research and for developments in the industry to protect the environment (Naidoo and Gasparatos, 2018), and fines and waste disposal fees to limit food losses and to induce donations (Bobe and Dragomir, 2020; Lee and Tongarlak, 2017). A need for stricter and better-formulated regulations was evidenced in the reviews of Roe et al. (2019), Beitz-Heineke et al. (2017) and Audet and Brisebois (2019). Particularly, government interventions directed to large retailers were highlighted, including incentives to induce them to donate or reuse unsold foods (Beitzen-Heineke et al., 2017). The study of Audet and Brisebois (2019) in Canada found that many foods were removed from shelves because the expiry dates imposed by the legal system were very short, particularly in products such as yogurt and eggs that were safe to be consumed over a longer time period. On the contrary, in the US, food date labels are inconsistent and are largely unregulated, which contributes to the confusion of consumers and the generation of avoidable food waste (Roe et al., 2019).

4.2.2. Sociocultural

Sociocultural trends included eating habits, food choices, shopping routines and demographic characteristics, availability of time, financial concerns, and level of environmental awareness in society. Understanding the relationship between socio-cultural trends and food waste behaviors can facilitate the design of strategies aimed at educating consumers. According to Schanes et al. (2018), there is no significant relationship between demographic characteristics and food waste, except for customer age. Research in Italy (Bravi et al., 2019) and the Czech Republic (Filipová et al., 2017), highlighted the role of retailers and the opportunity to start educating the younger population, which tends to be more responsive to marketing campaigns and strategies. Also, people over the age of 60 tend to limit their food waste (Janssens et al., 2019; Koivupuro et al., 2012). Other studies such as Ozbuk and Coskun (2020) identified that not only age, but also gender and ethnicity can influence waste behavior. Ai and Zheng (2019) found that Hispanic households tend to generate less food waste, and households with financial concerns due to low incomes tend to plan their purchases and have lower expectations of the quality of the products. Also, the educational level was associated with the level of awareness (Janssens et al., 2019; Marx-Pienaar and Erasmus, 2014). Socioeconomic status and employment status influenced food choices and the availability of time for worrying about food waste, for improving cooking skills and efficiency in food management at home, such as for planning diets and shopping.

4.2.3. Environmental/Natural influences

Results evidenced that environmental influences are a big challenge for reducing food waste in the supply chain. However, the understanding of these influences could help to target measures and practices to reduce food waste. First, natural characteristics of products such as perishability, sensitivity, and appearance can determine the shelf life of foods as their resistance during transport and handling, and their appealing for consumption. For example, according to Le Roux et al. (2018) while lettuce is highly perishable and needs high care on handling, there were products such as carrots, cabbage, beetroot, and broccoli with relatively long shelf-life and generally low wastage. Also, improving consumer tolerance and easing quality policies are important tasks to limit a great number of food losses due to their natural appearance. According to White et al. (2011), in the banana chain in Australia, 83% of edible waste was due to minor imperfections. On the other hand, environmental impacts, such as the depletion of natural resources, climate change, and other relevant problems such as acidification, eutrophication, etc., trigger concerns on reducing food waste. Also, the quantification of the impacts by type of foods can contribute to target actions. For example, the studies of Scholz (2015) and Scherhauser et al. (2018) recommended to give priority to reduce meats and dairy products waste because of their high negative impact on the environment. From a TBL perspective, reducing food waste often leads to a “win-win” scenario whereby the waste reduction has a positive impact on the economic bottom line for retailers and their supply chain partners as well as reducing the negative impact on the environment (Savitz and Weber, 2013).

4.2.4. Technological influences

Advances in technology can be tools for retailers to improve the management of food waste. There were methods proposed to increase the lifetime of products such as humidification to improve appearance (Fabbri et al., 2018), light treatment for retention of color in foods (Olson et al., 2020; Kasim et al., 2017), and coating treatments to extend shelf life (Kowalczyk et al., 2017; Venkatesh et al., 2018). Other technologies can facilitate monitor conditions and state of foods in transport, storage, and shelves such as radio-frequency technologies, GPS and sensors (Moraes et al., 2020) which also help to improve the exchange of information, communication, and collaboration between the members of the supply chain. Also, Derqui et al. (2016) and Moraes et al. (2020) suggested the use of demand management technologies for improving the accuracy of forecasts to reduce excess production, optimize storage space and reduce unforeseen changes in orders. Lastly, applying statistical methods could facilitate decision making of retail managers, such as multi-criteria decision analysis tools (MCDA) to support decision-making of food policy (Duret et al., 2019), computational methods to choose the most optimal package design and cold chain scenario (Wu et al., 2019) and integrated tools to assist decision-making in logistics and food waste management (Fancello et al., 2017; Soysal et al., 2015). There is a need for technologies financially viable, particularly technologies with the ability to turn food waste into inputs that can be reinserted in the supply chain (Jensen et al., 2013).

4.2.5. Economic Influences

Understanding economic influences in food waste can help to adapt and target measures and policies to reduce food waste. For example, in developing countries, major food losses occur in the upstream tiers, farms and production, and according to Kc et al. (2016) developing economies could reduce up to 49% of the food waste if they manage to improve the significant causes, including inefficiencies in storage, transportation, and cooling infrastructure occurring in the upstream tiers of the supply chain. This is not a big issue in developed countries because they have transport infrastructure, advance technologies and modern processing plants that can facilitate monitoring of foods, maximize profitability, and minimize food waste (Kumar, 2014; Horton et al., 2019). Taking a TBL view, it is clear to see how focusing on economic growth can have a direct impact on reducing waste and subsequently can help to limit the negative environmental impacts associated with food waste (e.g. natural resource depletion and climate change) as well as potentially reducing negative impacts associated with food waste such as food shortages and food security. Differently to developing countries, food waste in developed countries tend to concentrate in the downstream of the supply chain with 42% occurring at the consumer stage making strategies more effective to target at this level. Lebersorger and Schneider (2014) observed that retail stores in rural areas had significantly higher rates of food loss in certain food categories compared to retailers located in urban areas. Other examples of economic influences were periods of crisis and product shortages. For example, during the Covid-19 pandemic, more than 67% of consumers cut food waste in their homes during lockdown (Borsellino et al., 2020). Their findings showed that the population focused in minimizing food waste, purchasing behaviors changed to an increase in the demand of long-lasting products, there was a decrease in the demand of perishable foods such as fruits and vegetables, online shopping increased, and home delivery became more dominant. Lastly, there were economic models, such as the circular economy, becoming relevant for regions or countries including the EU, Japan, Canada and China, putting pressure to set goals for reusing and recycling food waste in supply chains (Secondi et al., 2019; Peira et al., 2018).

4.3. Positive factors in the Microenvironment

This section discusses how influences of competitors, customers, suppliers and external entities found in the microenvironment of the retail organization can contribute to reduce food waste in the

FSC. These influences are synthesized in Table 4 and in contrast to the study of Ozbuk and Coskun (2020) the retail organization in the current study is positioned in the internal environment.

4.3.1. Competitors

There was limited literature on influences of competitors to reduce food waste. Competitors turned food waste reduction practices into a competitive advantage and created incentives for retailers seeking success to imitate good practices such as in Cantaragiu (2019), Naidoo and Gasparatos (2018) and Aschemann-Witzel et al. (2016). There were retail formats looking to help the environment and society with non-expensive offerings of green products and surplus foods as an alternative to traditional supermarkets.

4.3.2. Customers

The influence of consumers included their shopping routines, food choices, handling and storage behaviors, concerns, and awareness (Teller et al., 2018; Willersinn et al., 2017; Lebersorger and Schneider, 2014). There is a growing body of literature on the role of consumers and the study identified customers engaging with retailers in food waste reduction practices. A sustainable relationship between retailers and consumers is key to reduce the highest amount of food waste which is generated in households and accounts for 53% of the overall food wastes in EU countries according to Chung (2019). Examples of their positive influence included consumers planning their shopping routines (e.g. planning meals, checking inventory, making shopping lists) which makes demand more predictable, helps retailers to increase accuracy of forecast and reduce over-ordering and excess of products, such as in Janssens et al. (2019), Schanes et al. (2018) and Mondéjar-Jiménez et al. (2016). The greater the consumers' knowledge of the problem of food waste, the more aware they were of their behavior and receptive to change, such as for better handling products in stores, using conservation strategies in storage and following "use by" and "best before" dates. According to Østergaard and Hanssen (2018), in Norway, 59.6% of consumers concerned about food waste, froze bread and used the toaster frequently to make dry bread edible and extending its shelf-life. Other ways consumers can reduce food waste is through their expression of preferences for supermarkets and products that were socially and environmentally friendly (e.g. suboptimal foods, ecological and fair-trade products), and through their demands for transparency in the supply chain and for help from retailers to reduce waste at home due to ethical reasons, economic concerns, and social pressures (Bobe and Dragomir, 2020; Aschemann-Witzel et al., 2019; Beitzen-Heineke et al., 2017; Naidoo and Gasparatos, 2018); Evans et al., 2017; Young et al., 2018).

4.3.3. Suppliers

Positive influences coming from suppliers depended on the willingness of farmers or producers to reduce food waste, the relationship of collaboration and coordination with retailers, flexibility in agreements and contracts, and efficiency in production and logistics (Moraes et al., 2020; Jensen et al., 2013). Jensen et al. (2013) suggested a need to change the perspective from a transactional relationship to a collaborative one in the supply chain. Lack of collaboration and coordination between suppliers and retailers was the third most cited cause of food waste in Moraes et al. (2020). The literature review identified various benefits from improving relationships with suppliers, such as willingness of producers to adapt practices, increased transparency in the supply chain, collaboration for educating consumers (Bobe and Dragomir, 2020; Beitzen-Heineke et al., 2017; Kikulwe et al., 2018), diversification of alternative markets for selling suboptimal foods (Ludwig-Ohm et al., 2019), and improved efficiency of production. Also, tolerance in contracts within reasonable limits favored the reduction of waste, such as contemplating delays in harvests and overproduction. For example, retailers in the UK guaranteed 98% of their orders in the banana production (Evans et al., 2017). Also, Brancoli et al. (2019) suggested retailers should have accountability in take-back agreements and share financial risk of food losses with producers. Lastly, there were good influences in production and logistics found such as agronomical methods

to improve yield and preserve quality, implementation of cooling systems, reduced wholesale pack sizes, development of proper packaging, shortening delivery times, educating personnel for improving handling, avoiding overloading, improving traceability of delivery, planning appropriate routes and covering foods from exposure to inadequate temperatures and sunlight (Moraes et al., 2020; Bobe and Dragomir, 2020; Brancoli et al., 2019; Kikulwe et al., 2018; Beitzen-Heineke et al., 2017; Jensen et al., 2013).

4.3.4. External entities

The relationship between retailers and different actors outside the retail organization were an influence to reduce food waste and according to Cantaragiu (2019), the ability and willingness of the retailer to establish relationships with its external environment played an important role on this. Within this group there were pressure groups such as NGOs, the general public, local communities, activists (e.g. environmentalists, consumer activists, dumpster divers), the media, and influencers (e.g. celebrities) which could induce retailers who care about their reputation to voluntarily adopt practices to reduce food waste (cf. Aschemann-Witzel et al., 2016; Núñez-Cacho et al., 2018; Naidoo and Gasparatos, 2018; Swaffield et al., 2018) and to fulfill their sustainability commitments (Aschemann-Witzel et al., 2019). Other relationships found were partnerships with charities, international NGOs, food banks, suboptimal food traders, researchers, activists, and public policy makers (Young et al.; 2018; Quested et al., 2011). For example, in Kulikovskaja and Aschemann-Witzel (2017) there were relationships between retailers, food banks and NGOs in Denmark for redistributing surplus food to people with limited resources. Lastly, scant literature was found for the establishment of industry standards for reducing food waste to cover the gap resulting from the lack of regulation by governments, such as in Roe et al. (2019) where industrial groups in the USA introduced labelling standards.

4.4. Positive factors in the Internal Environment/Internal Organization

This section discusses how the influences identified at the organization level, including management, operations, and marketing can contribute to the reduction of food waste.

4.4.1. Management

4.4.1.1. Top management role. Top managers are internal stakeholders' whose pressure can drive corporate environmental behavior. They can understand the environment of the organization, adapt policies and processes, decide to adopt technologies and food reuse methods, and manage relationships across the supply chain. Also, they were key to engage food store managers' by allowing flexibility, informing, and empowering them to implement strategies for food waste reduction in stores. Abilities of top managers to combat food waste included flexibility, visibility, collaboration, leadership, commitment, innovation, agility, and communication (Moraes et al., 2019).

4.4.1.2. Role of food store managers. Based on studies such as Cicatiello et al. (2020), Moraes et al. (2020), Moraes et al. (2019) and Ribeiro et al. (2019) many causes of food waste in the supply chain can be addressed on the individual store level by active involvement of store managers. Based on the fact that communication was one of the most frequent mentioned causes of food waste in the literature, store managers could improve communication at the store level and throughout the supply chain. Also, they could engage staff in stores, introduce incentives, provide training in prevention practices such as products handling, increase supervision and accountability, adapt processes and policies, and develop food waste promotions.

4.4.1.3. Role of policies. Making policies more flexible can reduce the food waste generated in stores. For instance, increasing acceptance of orders, easing quality standards and product specifications (Mena et al., 2014), allowing flexibility of promotions and replenishment levels to fluctuations in demand and deterioration rate of products, especially of perishable foods (Yang et al., 2017). Additionally, based on Moraes et al. (2019) and Mena et al. (2014), reducing on-shelf availability to optimal levels can reduce food waste generated by over-stocking which can also increase profits (Brancoli et al., 2019). According to Teller et al. (2018), incorporating the topic of food waste in guidelines and policies could increase awareness and engage store personnel with prevention procedures.

4.4.1.4. Role of retailers in the supply chain. Retailers have an unprecedented power to influence significant reductions of food waste across the food system (Moraes et al., 2020). Retailers with a good corporate reputation were more easily able to convince consumers to adopt sustainable behaviors (Aschemann-Witzel et al., 2019). Also, they can promote trust, transparency (e.g. reporting food waste), collaboration initiatives and information sharing (e.g. demand data). They can also develop partnerships, working on solutions that benefit the whole supply chain such as improving the logistics network design, introducing agreed metrics and targets of sustainability in the supply chain and using communication channels to change customers' behaviors. For example, Tesco is collaborating with partners globally to prevent food waste and developed a methodology for measuring the supply chain waste goals progress (Ocicka and Raźniewska, 2018). In Pulker et al. (2018), 22 of the 100 largest and most powerful supermarkets in the world made commitments to collaborate in reducing food waste in the supply chain. On the contrary, the study of Eriksson et al. (2017) investigating retailer-supplier contractual agreements in Sweden, concludes that "there seems to be a trend for higher levels of waste if the retailer bears less of the direct cost of waste".

4.4.1.5. Role of the retail store. Few papers studied specific retail store formats. Ribeiro et al. (2019) did not find a significant correlation between store size and food waste levels. However, Teller et al. (2018) found supermarkets and hypermarkets to have the highest potential to reduce food waste. Ai and Zheng (2019) indicated that studies have consistently found the ratio of food waste generated in supermarkets being lower than in small retailers. The study of Cicatiello et al. (2017) regarding food waste in a large retail store in Italy revealed that a significant amount, mainly of fresh produce waste, is unrecorded. There were certain non-conventional retail stores based on sustainable models including zero-packaging stores in Beitzel-Heineke et al. (2017), family-owned business in Núñez-Cacho et al. (2018), social supermarkets in Michelini et al. (2018), cooperative supermarkets in Ribeiro et al. (2019) and farmer markets in Aschemann-Witzel et al. (2019). Farmer markets were advantageous for promoting acceptance of suboptimal foods, and stores with an established good image were more able to convince consumers to adopt sustainable behaviors (Aschemann-Witzel et al., 2019).

4.4.1.6. Ethical, financial, and reputational motivators. Care for the environment, for the community and the desire of some retailers for doing the 'right' thing moved them to acknowledge their role in the problem of food waste and expressing regret for food wasted (Goodman-Smith et al., 2020; Audet and Brisebois, 2019; Yngfalk, 2019; Ribeiro et al., 2019; Swaffield et al., 2018). Also, financial benefits including fiscal incentives, savings in operational costs and new business opportunities, motivated retailers to reduce food waste such as in (Goodman-Smith et al., 2020; Moraes et al., 2019; Sogn-Grundvag et al., 2019; Bilska et al., 2018; Duong et al., 2018; Núñez-Cacho et al., 2018; Naidoo and Gasparatos, 2018; Swaffield et al., 2018; Evans et al., 2017; Eriksson et al., 2017; Bobe and Dragomir, 2010). Lastly, benefits for the organizational reputation including brand value, position in the market in the long term, loyalty of customers, induced retailers to communicate their commitments in reducing food waste among stakeholders (Cicatiello

et al., 2020; Alfiero et al., 2020; Swaffield et al., 2018; Bobe and Dragomir, 2010; Goodman-Smith et al., 2020).

4.4.2. Operations

4.4.2.1. *Accuracy of demand planning.* Strategies for improving accuracy of demand forecasts, planning and ordering, are essential to reduce excess production as a large share of the food chain operates based on forecasts. Examples of these strategies included the implementation of data science solutions (Sakoda et al., 2019), demand management systems, demand history technologies (Moraes et al., 2020), synchronizing data and material flow (Selvaraju and Arokiasamy, 2019), and sharing demand and stock levels data with suppliers (Brancoli et al., 2019; Ribeiro et al., 2019; Ocicka and Raźniewska, 2018).

4.4.2.2. *Inventory procedures.* There were practices of stock control, ordering and replenishment that influenced the reduction of food waste, i.e. setting adequate safety stock levels and using correct information of inventory levels and products' shelf-life to reduce ordering mistakes (Wang et al., 2019; Akkas et al., 2019). Regarding replenishment, there were strategies of foods substitution in stock-out periods recommended in Duong et al. (2018). Other authors recommended engaging store managers and employees on correct handling and replenishment of shelves, which were less costly than implementing technologies of forecasting and automated replenishment (Ocicka and Raźniewska, 2018; Kiil et al., 2018; Moraes et al., 2019)

4.4.2.3. *Quality management.* One of the most frequently mentioned strategies to reduce deterioration and extend shelf-life of products was to improve handling along the supply chain and optimize storage conditions such as cold chains (e.g., performing periodic equipment maintenance for refrigerated trucks, implementation of temperature control technologies), which is vital for perishable and fresh products (Leithner and Fikar, 2019). Other strategies included the implementation of quality control methods such as sensory technologies for the traceability of shelf-life in real time, design of adequate packaging to provide protection for transport and storage in households, and design of adequate labelling to avoid confusion for proper handling and storage.

4.4.2.4. *Food waste disposition.* The most effective method to reduce food waste is by preventing it entirely. Calculating food losses in stores allowed retailers to target preventive measures. Disposal was considered to be the last resort. Also, food waste management systems were proposed in several studies to prevent food waste (Teller et al., 2018; Audet and Brisebois, 2019; Leithner and Fikar, 2019). Recommended disposal methods of food waste were prioritized by their effectiveness and impact on costs. First was re-use methods (such as food donations for human consumption), second was recycling methods (e.g., use for animal feed or agriculture) and last, recovery methods (use for energy generation). Several articles proposed recovery methods for turning food waste into an input in supply chains, which is linked to the circular economy perspective according to Frei et al. (2020) and Secondi et al. (2019), and reverse logistics by Bottani et al. (2019).

4.4.3. Marketing

4.4.3.1. *Pricing and promotions.* Dynamic pricing and discounts on suboptimal foods such as when foods are approaching expiration date, pro-sustainability promotions such as “buy one, get one free later” by Tesco, promotions on smaller packs and the removal of multi-buy promotions that triggered over-purchase (e.g., “Buy one get one free”) were examples of marketing initiatives that influenced the reduction of food waste with additional benefits including increasing sales volume, trust, satisfaction of consumers and in some cases profitability (Chung, 2019; Zhu, 2017). Price reductions on products with minor defects are becoming widespread in Europe (Cicatiello et al.,

2019). However, such strategies could reduce food waste in supermarkets while transferring waste to households as indicated in Brancoli et al. (2019). Therefore, this is where the educational role of retailers on waste management strategies at households were important.

4.4.3.2. *Communication and education.* Strategies to create awareness and educate consumers could influence behaviours regarding food waste prevention in-store and in households (Aschemann-Witzel et al., 2020; Cicatiello et al., 2020; Cicatiello et al., 2019; Young et al., 2018). Examples of these were marketing campaigns, the combination of communication channels and promotions with positive messages in stores, advertisements, in-store magazines, social media, emails and product labelling with innovative ways to display and allocate suboptimal foods on shelves. Aschemann-Witzel et al. (2019) highlighted how pricing strategies were combined with messages of monetary savings and emotional appeal to pity on suboptimal foods which increased their quality perception and choice likelihood. In Cooremans and Geuens (2019) displaying “ugly” foods with smiling faces and body parts replacing abnormalities improved their acceptance. Lastly, in Pulker et al. (2018) four of the 100 world’s largest supermarkets committed to provide consumers in the UK with advice on food storage and recipes to use leftovers.

Table 4. Factors influencing food waste reduction

Macro-environment	Microenvironment	Internal
<p>Regulatory</p> <ul style="list-style-type: none"> - Environmental regulations - Political engagement - Self-regulation in the industry <p>Sociocultural</p> <ul style="list-style-type: none"> - Eating habits - Food choices - Shopping routines - Demographic characteristics - Availability of time - Financial concerns <p>Environmental/Natural</p> <ul style="list-style-type: none"> - Natural characteristics of foods - Environmental impacts <p>Technological</p> <ul style="list-style-type: none"> - Methods to extend product shelf-life - Monitoring and communication technologies - Demand management technologies - Conversion technologies - Decision-making tools <p>Economic</p> <ul style="list-style-type: none"> - Level of income and development of a country - Periods of crisis and food shortages - Economic models 	<p>Competitors</p> <ul style="list-style-type: none"> - Competitive advantage in food waste - Non-traditional food retail formats <p>Customers</p> <ul style="list-style-type: none"> - Planning shopping routines - Food choices - Food handling and storage behaviours - Customers’ awareness and concerns <p>Suppliers</p> <ul style="list-style-type: none"> - Attitudes of farmers and producers - Collaboration between suppliers and retailers - Flexibility in agreements and contracts - Production and logistics processes <p>External Entities</p> <ul style="list-style-type: none"> - Pressure groups - Strategic partners - Industry groups 	<p>Management</p> <ul style="list-style-type: none"> - Top management role - Role of food store managers - Role of policies - Role of retailers in the supply chain - Role of the retail store - Ethical, financial, and reputational motivators <p>Operations</p> <ul style="list-style-type: none"> - Demand planning - Inventory control, ordering and replenishment - Quality management - Food waste disposition <p>Marketing</p> <ul style="list-style-type: none"> - Pricing and promotions - Communication and education

5. Conclusion

Based on the review of 175 peer-reviewed academic articles, the present study has revealed that supermarkets are the most researched type of food retailer in food waste research, followed by non-conventional retailers and grocery stores. The majority of food retail organizations that have been investigated are based in the United Kingdom, the United States, Italy, and Sweden, showing that research in this field typically focuses on organizations operating in high-income countries. Food retailers play an important role due to their unique position to drive food waste reduction behaviors in different actors in the FSC. To assist food retail organizations and stakeholders who are seeking to reduce food waste in the FSC, the study has identified all influences that impact the volume of food waste across the different stages of the FSC from a retailers' perspective; particularly, it analyzed the positive influences contributing to reduce food waste. There were 44 food reduction factors, grouped into 12 categories, presented in Table 4.

Approaching the topic from a combined view of two different theoretical lenses, the organizational theory, as discussed by Özbük and Coşkun (2020), and the Triple Bottom Line framework, provided the opportunity for the present study to broaden its scope, going beyond the limits of the supply chains and identifying food reduction factors within the wider macro-environment under which a food retail organization operates. The macro-environment dimension of the organization theory yielded political, sociocultural, environmental, technological, and economic influences, which may exert either positive or negative effects to food waste reduction. Based on the mapping of the reviewed articles in the Appendix, the most addressed influences of the food retailers' macro-environment are the "regulatory" and the "technological" factors concerning the prevention or reduction of food waste, and the "environmental" factor related to food waste generation. The microenvironment dimension of the food retail organization includes the influences of competitors, customers, suppliers and external entities. The "customers" and "suppliers" factors received the most attention from researchers (both positive and negative perspectives). The "external entities", such as various pressure groups, strategic partners, and industry groups, were mainly considered as positive factors to food waste reduction. The internal environment dimension is classified in three types of influences, those of "management", "operations", and "marketing". All three have received significant attention from researchers, with the former two being the most frequently mentioned of all factors in the literature for preventing or reducing food waste. This aligns with the finding of Cicatiello et al. (2020), where improved operations were perceived by retail store managers as the main factor in reducing food waste.

This review highlights several sociocultural, environmental and economic factors that impact food waste relating to the TBL concept spanning the macro, micro and internal organizational environments. These factors are often interrelated, emphasizing the relevance of incorporating the TBL concept into food waste research. For example, the findings of this review highlight that achieving economic growth in developing countries could help increase investment into the necessary technologies and supply chain infrastructure required to reduce food waste substantially. Subsequently, this would help to reduce the negative environmental impacts of food waste (e.g. the depletion of natural resources and the contribution to climate change) and also help to address some of the social concerns related to food shortages and food security. The goals of food waste reduction intertwine with the goals of sustainable development. Hence, the TBL is an appropriate framework for approaching future food waste research.

The present study attempted to expand on the work of previous systematic reviews such as those of Özbük and Coşkun (2020), Moraes et al. (2020), and Chkanikova and Mont (2015). The SLR conducted by Özbük and Coşkun (2020) analyzed 92 articles, disclosing potential causes of food waste at the downstream levels of the FSC and classified them into the three dimensions of the organizational theory. The current study repositioned the microenvironment influences of the retail

organization and enhanced the macro-environment influences with the “technological” factor, which has gained growing attention in recent years, as seen in the Appendix. The SLR performed by Moraes et al. (2020) investigated 54 articles published until July 2017. Their analysis mapped causes of food waste and reduction practices in the food retail sector and provided a categorization of six groups of causes based on the Ishikawa Diagram. Their approach differs widely from that of the present study. Nevertheless, the factors they identified are supported by the current study. The claim of the authors in the two studies mentioned above, stating that very few studies exist offering comprehensive research, such as SLR on food waste, is also confirmed by this study. Chkanikova and Mont (2015) stated that academic research on the various factors affecting what they refer to as ‘Supply Chain Responsibility’ in food retail is lacking. They suggested that providing a deeper understanding of these factors would help assist retail businesses. Their study classified four major groups of external factors that exert pressure on food retailers, based on the taxonomy of institutional factors. Whilst the aforementioned study focuses solely on external factors, the present work expands upon this and provides a comprehensive classification covering the influences on food waste existing in the three dimensions of the retail organization.

One of the most notable developments during the deployment of this study was the recent pandemic. Borsellino et al. (2020) and Lombardi and Costantino (2020) presented the influences of food waste on the food retail chain in the context of Covid-19. Borsellino et al. (2020) identified a substantial reduction in food waste during the Covid-19 pandemic. The changes in the food retail industry that arose from the pandemic present an opportunity to transform the current structure to a more sustainable FSC, as noted (section 4.2.5 – *economic influences*) due to changes in behaviors, (online) ordering, and (home) deliveries. A more recent study conducted by Huang et al. (2021) provided a systematic review focusing on reported retail food waste practices and developed a framework based on five approaches, namely, repositioning, reallocating, reacting, re-engineering and relating. Those approaches are translated into retailers’ mitigation activities of food waste such as reduce, reuse, recycle, recover for energy, and disposal (Huang et al., 2021). These are positioned under the umbrella of the internal category, more specifically, in the operations (section 4.4.2.4 – *food waste disposition*) and marketing factor classification (section 4.4.3.1 - *pricing and promotions*), and the microenvironment category such as the supplier factor classification (section 4.3.3 – *suppliers*) of the present study.

The study contributes to the food waste body of knowledge and to the wider academic literature of sustainable food supply chains and retailers’ perspectives on food waste. It combines organizational theory and the TBL in the analysis and unification of studies with a methodology that amalgamates the three macro-stages and the PRISMA statement for reporting the systematic review. The range of the food waste influential factors identified in the study can provide a valuable guide for practitioners and decision makers in the food industry as it covers the whole spectrum of the related entities and activities of the retailers’ organizational environment.

6.1. Areas for future research and limitations of the study

One of the main purposes of a systematic literature review is to highlight avenues for future research. The present work has highlighted several lesser explored areas related to the retailer perspective of food waste and lays a foundation for future research in the area. In the Appendix, it can be observed that the least researched areas (fewer publications) are the influence of competitors in the microenvironment and the economic influences in the macro-environment.

Consumer demand for online food retail has significantly increased due to the Covid-19 pandemic which has accelerated the adoption of the supporting technologies. The literature reviewed for this study suggests that technology is far more likely to aid in the reduction of food waste than it is to cause it (see Appendix). Further research is needed to understand how this new wave of technological development impacts food waste. This is likely to be a particularly important

stream of food waste research, given that it focuses on the influence that food retailers can have on consumer behaviour. For example, an interesting avenue for future research could be the examination of whether online food retailers can use technology to help reduce household food waste. As previously highlighted, this is known to be one of the biggest causes of food waste in the supply chain. Furthermore, the examination of the impacts of increased online food retail and investment in supporting technologies upstream in the FSC could also deliver valuable insights. Investment in Artificial Intelligence systems, Internet of Things capabilities, and Big Data Management is likely to have increased with the recent changes in consumer behaviour (switch to online retail habits). The impact of this is likely to be improved demand planning and inventory management and therefore it would be useful to know the subsequent impact this may have on food waste.

The food waste factors identified in this work were gathered from studies that mainly focused on retail organizations and supply chains operating in high-income countries. The current research can be extended by comparing literature findings from studies conducted in different countries or regions. Similarly, significant insights could be obtained by comparing literature findings across studies conducted on the different types of retail stores. From a quantitative point of view, the research can be extended by investigating the relationships and interactions between the factors across and within the three dimensions of the retail organization. Quantitative studies could help to unveil relevant correlations of the identified food waste factors. A deeper understanding of this could help to support managerial decisions toward reducing food waste across all dimensions.

The recommendations detailed above are proposed in response to some of the identified limitations in this present study. These are as follows:

- Only articles that were published between the years 2010 to 2020 were included in the review.
- Articles were searched in two, albeit broad and popular bibliographical databases (Scopus and Web of Science), with the possibility of some important studies in other databases being excluded.
- The qualitative nature of the research always entails the risk of the authors' subjective biases in the selection of the publications during the screening stage, the analysis of the data, and the reporting of the results.
- The exclusion of all non-refereed academic articles such as grey literature and sustainability reports issued by retail organizations are important sources that could have provided insightful supplementary information to the topic.
- The study analyzed the findings of articles that concentrated mainly on developed economies due to the very limited research on developing and underdeveloped ones, thus, it can be considered biased.

In the Appendix, the articles are categorized according to two criteria. First, they are categorized horizontally according to the corresponding type of influence based on the three environments of the retail organization. Second, they are categorized into columns according to the main focus of the article. The influences studied in-depth are colored in blue, while the influences not covered in any depth, are colored in yellow. The table helps to identify opportunities for further research, such as the influence of competitors in the microenvironment and the economic influences in the macro-environment.

DIMENSION		Articles addressing influences that prevent/reduce food waste	Articles addressing both positive and negative influences of food waste	Articles addressing influences generating food waste
MACROENVIRONMENT	Regulatory	Borsellino et al. (2020), Lombardi and Costantino (2020), Maye et al. (2019), Sedlmeier et al. (2019), Ocicka and Raźniewska (2018), Kazimierowicz (2018), Liberti et al. (2018), Naidoo and Gasparatos (2018), Núñez-Cacho et al. (2018), Vitale et al. (2018), Beitzten-Heineke et al. (2017), Campbell et al. (2017), Lee and Tongarlak (2017), Tostivint et al. (2017), Kornfeld (2014), Quested et al. (2011)	Burek and Nutter (2020), Moraes et al. (2020), Goodman-Smith et al. (2020), Wielicka-Regulska, A. (2020), Audet and Brisebois (2019), Roe et al. (2019), Ng et al. (2019), Xue et al. (2019), Bilska et al. (2018), Swaffield et al. (2018), Svanes et al. (2019), Young et al. (2018), Schanes et al. (2018), Evans et al. (2017), Gollnhofer and Schouten (2017), Ghosh et al. (2016), Pacilly et al. (2016), Rajagopal and Bansal (2015), Willersinn et al. (2015), Evans-Cowley and Arroyo-Rodríguez (2013), Bobe and Dragomir (2010).	Finlayson (2018), Porter et al. (2018), Kumar (2014)
	Sociocultural	Borsellino et al. (2020), Goodman-Smith et al. (2020), Campbell et al. (2017)	Wielicka-Regulska, A. (2020), Ai and Zheng (2019), Aschemann-Witzel et al. (2019), Bravi et al. (2019), Ghinea and Ghiuta (2019), Janssens et al. (2019), Moran et al. (2019), Cooper et al. (2018), Kikulwe et al. (2018), Østergaard and Hanssen (2018), Schanes et al. (2018), Filipová et al. (2017), Soma (2017), Ghosh et al. (2016), Kc et al. (2016), Mondéjar-Jiménez et al. (2016), Willersinn et al. (2015), Marx-Pienaar and Erasmus (2014), Evans-Cowley and Arroyo-Rodríguez (2013), Garnett (2013), Koivupuro et al. (2012), Quested et al. (2011).	Moraes et al. (2020), Horton et al. (2019), Ng et al. (2019), Rajagopal and Bansal (2015), Katajajuuri et al. (2014),
	Environmental	Goodman-Smith et al. (2020),	Moraes et al. (2020), Horton et al. (2019), Svanes et al. (2019), Xue et al. (2019), Cooper et al. (2018), Duong et al. (2018), Espinoza and Azapagic (2018), Ghosh et al. (2016), Pacilly et al. (2016), Eberle and Fels (2016), Rajagopal and Bansal (2015), Scholz et al. (2015), Garnett (2013)	Aschemann-Witzel et al. (2020), Audet and Brisebois (2019), Bilska et al. (2020), Cicatiello et al. (2019), Moraes et al. (2019), Ludwig-Ohm et al. (2019), Ribeiro et al. (2019), Selvaraju and Arokiasamy (2019), Bilska et al. (2018), Finlayson (2018), Huang et al. (2018), Kiil et al. (2018), Le Roux et al. (2018), Scherhauser et al. (2018), Young et al. (2018), Beitzten-Heineke et al. (2017), Gautam et al. (2017), Hadawey et al. (2017), Yang et al. (2017), Vinyes et al. (2017), Cicatiello et al. (2016), Buzby et al. (2015), Katajajuuri et al. (2014), Mena et al. (2014),

			Eriksson et al. (2014), Venkat (2011), Quested et al. (2011), White et al. (2011),
	Economic	Borrello et al. (2020), Borsellino et al. (2020), Secondi et al. (2019), Liberti et al. (2018), Núñez-Cacho et al. (2018), Borrello et al. (2017)	Burek and Nutter (2020), Maye et al. (2019), Gautam et al. (2017), Ghosh et al. (2016), Buzby et al. (2015), Kc et al. (2016), Evans-Cowley and Arroyo-Rodríguez (2013), Jensen et al. (2013), Koivupuro et al. (2012). Venkat (2011)
	Technological	Mozos et al. (2020), López-Gómez et al. (2020), Mullick et al. (2020), Olson et al. (2020), Pateman et al. (2020), Das (2019), Duret et al. (2019), Leithner and Fikar (2019), Ludwig-Ohm et al. (2019), Sakoda et al. (2019), Ng et al. (2019), Fabbri et al. (2018), Kiil et al. (2018), Liberti et al. (2018), Michelini et al. (2018), Schanes et al. (2018), Díaz et al. (2017), Fancello et al. (2017), Horton et al. (2017), Plazzotta et al. (2017), Yang et al. (2017), Mondello et al. (2017), Zhu (2017), Bortolini et al. (2016), Evans (2015), Giroto et al. (2015), Verghese et al. (2015), Wang et al. (2010).	Moraes et al. (2020), Venkatesh et al. (2018), Vitale et al. (2018), Gautam et al. (2017), Kowalczyk et al. (2017), Ghosh et al. (2016), Soysal et al. (2015), Willersinn et al. (2015), Jensen et al. (2013). Heard and Miller (2019), Alamar et al. (2018), Redlingshöfer et al. (2017), Kumar (2014). Lebersorger and Schneider (2014)
MICROENVIRONMENT	Competitors	Alfiero et al. (2020), Sedlmeier et al. (2019), Naidoo and Gasparatos (2018), Ocicka and Raźniewska (2018), Beitz-Heineke et al. (2017), Aschemann-Witzel et al. (2016)	Aschemann-Witzel et al. (2019), Kornfeld (2014), Audet and Brisebois (2019) Moraes et al. (2020), Ribeiro et al. (2018)

<p>Customers</p>	<p>Borsellino et al. (2020), Gollnhofer et al. (2019), Yuan et al. (2019), Huang et al. (2018), Naidoo and Gasparatos (2018), Ocicka and Raźniewska (2018), Young et al. (2018)</p> <p>Aschemann-Witzel et al. (2020), Borrello et al. (2020), Brščić (2020), Goodman-Smith et al. (2020), Vittuari et al. (2020), Mullick et al. (2020), Wielicka-Regulska, A. (2020), Aschemann-Witzel et al. (2019), Bravi et al. (2019), Chung (2019), Cicatiello et al. (2019), Cooremans and Geuens (2019), Ghinea and Ghiuta (2019), Horton et al. (2019), Janssens et al. (2019), Moran et al. (2019), Reynolds et al. (2019), Svanes et al. (2019), Cooper et al. (2018), Finlayson (2018), Porter et al. (2018), Østergaard and Hanssen (2018), Schanes et al. (2018), Welch et al. (2018), Aschemann-Witzel et al. (2017), Bhatt et al. (2017), Beitzen-Heineke et al. (2017), Belavina et al. (2017), Borrello et al. (2017), Evans et al. (2017), Gollnhofer and Schouten (2017), Rohm et al. (2017), Willersinn et al. (2017), Aschemann-Witzel et al. (2016), Cicatiello et al. (2016), Mondéjar-Jiménez et al. (2016), Ratinger et al. (2016), Aschemann-Witzel et al. (2015), Blanke (2015), Marx-Pienaar and Erasmus (2014), Koivupuro et al. (2012), Quested et al. (2011).</p> <p>Moraes et al. (2020), Audet and Brisebois (2019), Brancoli et al. (2019), Leithner and Fikar (2019), Ribeiro et al. (2019), Sakoda et al. (2019), Selvaraju and Arokiasamy (2019), Yngfalk (2019), Duong et al. (2018), Kiil et al. (2018), De Hooge et al. (2017), Eriksson et al. (2016), Ghosh et al. (2016), Buzby et al. (2015), Rajagopal and Bansal (2015), Willersinn et al. (2015), Tjårnemo and Södahl (2015), Eriksson et al. (2014)</p>
<p>Suppliers</p>	<p>Akkaş and Sahoo (2020), Alfiero et al. (2020), Leithner and Fikar (2019), Huang et al. (2018), Kiil et al. (2018), Núñez-Cacho et al. (2018), Ocicka and Raźniewska (2018), Peira et al. (2018), Zheng et al. (2017), Bortolini et al. (2016)</p> <p>Moraes et al. (2020), Akkas et al. (2019), Brancoli et al. (2019), Moraes et al. (2019), Horton et al. (2019), Ludwig-Ohm et al. (2019), Ribeiro et al. (2019), Secondi et al. (2019), Svanes et al. (2019), Duong et al. (2018), Kikulwe et al. (2018), Porter et al. (2018), Beausang et al. (2017), Beitzen-Heineke et al. (2017), Evans et al. (2017), Espinoza and Azapagic (2018), Gautam et al. (2017), Le Roux et al. (2018), Tostivint et al. (2017), Zhu (2017), Aschemann-Witzel et al. (2016), Cicatiello et al. (2016), Pacilly et al. (2016), Blanke (2015), Soysal et al. (2015), Verghese et al. (2015), Eriksson et al. (2014), Mena et al. (2014)</p> <p>Biliska et al. (2018), Ribeiro et al. (2018), Dome and Prusty (2017), Eriksson et al. (2017), Kulikovskaja and Aschemann-Witzel (2017), Redlingshöfer et al. (2017), Ghosh et al. (2016), Love et al. (2015), Buzby et al. (2015), White et al. (2011), Kumar (2014)</p>

	External Entities	<p>Lombardi and Costantino (2020), Sundgren, C. (2020), Aschemann-Witzel et al. (2019), Aschemann-Witzel et al. (2017), Brancoli et al. (2019), Craig (2019), Das (2019), Tikka (2019), Wikström et al. (2019), Liberti et al. (2018), Michelini et al. (2018), Naidoo and Gasparatos (2018), Núñez-Cacho et al. (2018), Ocicka and Raźniewska (2018), Ribeiro et al. (2018), Young et al. (2018), Beitzel-Heineke et al. (2017), Gollnhofer (2017)a, Gollnhofer (2017)b, Kulikovskaja and Aschemann-Witzel (2017), Buzby et al. (2015), Evans (2015), Eriksson et al. (2014), Lindeman (2012), Quested et al. (2011),</p>	<p>Bergström et al. (2020), Moraes et al. (2020), Goodman-Smith et al. (2020), Ai and Zheng (2019), Bilska et al. (2018), Swaffield et al. (2018), Evans et al. (2017), Gollnhofer and Schouten (2017), Ghosh et al. (2016), Warshawsky (2016), White et al. (2011), Evans-Cowley and Arroyo-Rodríguez (2013), Phillips et al. (2013).</p>
INTERNAL ENVIRONMENT	Management	<p>Borrello et al. (2020), Bergström et al. (2020), Ai and Zheng (2019), Sedlmeier et al. (2019), Leithner and Fikar (2019), Wu et al. (2019), Duong et al. (2018), Huang et al. (2018), Michelini et al. (2018), Naidoo and Gasparatos (2018), Núñez-Cacho et al. (2018), Ocicka and Raźniewska (2018), Aschemann-Witzel et al. (2017), Beitzel-Heineke et al. (2017), Cicatiello et al. (2017), Gollnhofer (2017)a, Gollnhofer (2017)b, Kulikovskaja and Aschemann-Witzel (2017), Zheng et al. (2017), Eriksson et al. (2016), Evans (2015), Potts Dawson (2011), Bobe and Dragomir (2010)</p>	<p>Alfiero et al. (2020), Brščić (2020), Cicatiello et al. (2020), Moraes et al. (2020), Goodman-Smith et al. (2020), Audet and Brisebois (2019), Cicatiello et al. (2019), Moraes et al. (2019), Ludwig-Ohm et al. (2019), Ribeiro et al. (2019), Sakoda et al. (2019), Svanes et al. (2019), Wang et al. (2019), Wikström et al. (2019), Bilska et al. (2018), Le Roux et al. (2018), Porter et al. (2018), Ribeiro et al. (2018), Swaffield et al. (2018), Welch et al. (2018), Belavina et al. (2017), Eriksson et al. (2017), Gollnhofer and Schouten (2017), Tostivint et al. (2017), Yang et al. (2017), Zhu (2017), Aschemann-Witzel et al. (2016), Ghosh et al. (2016), Warshawsky (2016), Aschemann-Witzel et al. (2015), Tjärnemo and Södahl (2015), Mena et al. (2014)</p> <p>Tanios et al. (2020), Ghosh and Eriksson (2019), Horton et al. (2019), Roe et al. (2019), Yngfalk (2019), Kiil et al. (2018), Peira et al. (2018), Young et al. (2018), Kato et al. (2017), Dome and Prusty (2017), Fiore et al. (2015), Willersinn et al. (2015), White et al. (2011).</p>
	Operations	<p>Alfiero et al. (2020), Bergström et al. (2020), Sundgren, C. (2020), Ai and Zheng (2019), Bottani et al. (2019), Leithner and Fikar (2019), Ludwig-Ohm et al. (2019), Wu et al. (2019), Duret et al. (2019), Ng et al. (2019), Cooper et al. (2018), Michelini et al. (2018), Moulton et al. (2018), Naidoo and Gasparatos (2018), Ocicka and Raźniewska (2018), Aschemann-Witzel et al.</p>	<p>Akkas et al. (2019), Moraes et al. (2020), Goodman-Smith et al. (2020), Brancoli et al. (2019), Cicatiello et al. (2019), Moraes et al. (2019), Horton et al. (2019), Ribeiro et al. (2019), Sakoda et al. (2019), Sedlmeier et al. (2019), Selvaraju and Arokiasamy (2019), Secondi et al. (2019), Svanes et al. (2019), Wang et al. (2019), Xue et al. (2019), Wikström et al. (2019), Bilska et al. (2018), Duong et al. (2018), Finlayson (2018), Vitale</p> <p>Burek and Nutter (2020), Tanios et al. (2020), Audet and Brisebois (2019), Kiil et al. (2018), Managa et al. (2018), Dome and Prusty (2017), Hadawey et al. (2017), Kato et al. (2017), Tostivint et al. (2017), Buzby et al. (2015), Lebersorger and Schneider (2014), Nunes et al. (2011).</p>

	(2017), Cicatiello et al. (2017), Eriksson and Spångberg (2017), Fancello et al. (2017), Kulikovskaja and Aschemann-Witzel (2017), Mondello et al. (2017), Eriksson et al. (2016), Quested et al. (2011)	et al. (2018), Le Roux et al. (2018), Beitzen-Heineke et al. (2017), Yang et al. (2017), Zhu (2017), Cicatiello et al. (2016), Ghosh et al. (2016), Warshawsky (2016), Rajagopal and Bansal (2015), Blanke (2015), Soysal et al. (2015), Verghese et al. (2015), Eriksson et al. (2014), Mena et al. (2014).
Marketing	Moraes et al. (2020), Goodman-Smith et al. (2020), Mullick et al. (2020), Chung (2019), Cooremans and Geuens (2019), Reynolds et al. (2019), Cooper et al. (2018), Finlayson (2018), Ocicka and Raźniewska (2018), Young et al. (2018), Aschemann-Witzel et al. (2017), Gollnhofer (2017)a, Kulikovskaja and Aschemann-Witzel (2017), Quested et al. (2011)	Aschemann-Witzel et al. (2020), Aschemann-Witzel et al. (2019), Ribeiro et al. (2019), Bilska et al. (2018), Cooper et al. (2018), Yang et al. (2017), Young et al. (2017), Zhu (2017), Aschemann-Witzel et al. (2016), Ghosh et al. (2016), Aschemann-Witzel et al. (2015), Tjärnemo and Södahl (2015), Mena et al. (2014)

6. References

- Ai, N. and Zheng, J., 2019. Community-based food waste modelling and planning framework for urban regions. *Journal of Agriculture, Food Systems, and Community Development*, 9(1), 39-58. <https://doi.org/10.5304/jafscd.2019.091.009>
- Akkaş, A. and Sahoo, N., 2020. Reducing Product Expiration by Aligning Salesforce Incentives: A Data-driven Approach. *Production and Operations Management*, 29(8), 1992-2009. <https://doi.org/10.1111/poms.13191>
- Akkas, A., Gaur, V. and Simchi-Levi, D., 2019. Drivers of product expiration in consumer packaged goods retailing. *Management Science*, 65(5), 2179-2195. <https://doi.org/10.1287/mnsc.2018.3051>
- Alamar, M.D.C., Falagán, N., Aktas, E. and Terry, L.A., 2018. Minimising food waste: a call for multidisciplinary research. *Journal of the Science of Food and Agriculture*, 98(1), 8-11. <https://doi.org/10.1002/jsfa.8708>
- Alfiero, S., Christofi, M. and Bonadonna, A., 2020. Street food traders, farmers and sustainable practice to reduce food waste in the Italian context. *British Food Journal*. 122(5), 1361-1380. <https://doi.org/10.1108/BFJ-04-2019-0265>
- Amos, O.A. and Uniamikogbo, E., 2016. Sustainability and Triple Bottom Line: An Overview of Two Interrelated Concepts. *Igbinedion University Journal of Accounting*, 2(16), 88-126.
- Aschemann-Witzel, J., De Hooge, I. and Normann, A., 2016. Consumer-related food waste: Role of food marketing and retailers and potential for action. *Journal of International Food & Agribusiness Marketing*, 28(3), 271-285. <https://doi.org/10.1080/08974438.2015.1110549>
- Aschemann-Witzel, J., De Hooge, I., Amani, P., Bech-Larsen, T. and Oostindjer, M., 2015. Consumer-related food waste: Causes and potential for action. *Sustainability*, 7(6), 6457-6477. <https://doi.org/10.3390/su7066457>
- Aschemann-Witzel, J., De Hooge, I.E., Rohm, H., Normann, A., Bossle, M.B., Grønhøj, A. and Oostindjer, M., 2017. Key characteristics and success factors of supply chain initiatives tackling consumer-related food waste—A multiple case study. *Journal of cleaner production*, 155, 33-45. <https://doi.org/10.1016/j.jclepro.2016.11.173>

- Aschemann-Witzel, J., Giménez, A. and Ares, G., 2020. Suboptimal food, careless store? Consumer's associations with stores selling foods with imperfections to counter food waste in the context of an emerging retail market. *Journal of Cleaner Production*, 262, 121252. <https://doi.org/10.1016/j.jclepro.2020.121252>
- Aschemann-Witzel, J., Otterbring, T., de Hooge, I.E., Normann, A., Rohm, H., Almli, V.L. and Oostindjer, M., 2019. The who, where and why of choosing suboptimal foods: Consequences for tackling food waste in store. *Journal of Cleaner Production*, 236, 117596. <https://doi.org/10.1016/j.jclepro.2019.07.071>
- Audet, R. and Brisebois, É., 2019. The social production of food waste at the retail-consumption interface. *Sustainability*, 11(14), 3834. <https://doi.org/10.3390/su11143834>
- Basil, H. (2018). Business environment-Conceptual framework and policies. *International educational scientific research journal*, 68.
- Beausang, C., Hall, C. and Toma, L., 2017. Food waste and losses in primary production: Qualitative insights from horticulture. *Resources, Conservation and Recycling*, 126, 177-185. <https://doi.org/10.1016/j.resconrec.2017.07.042>
- Beitzen-Heineke, E.F., Balta-Ozkan, N. and Reefke, H., 2017. The prospects of zero-packaging grocery stores to improve the social and environmental impacts of the food supply chain. *Journal of Cleaner Production*, 140, 1528-1541. <https://doi.org/10.1016/j.jclepro.2016.09.227>
- Belavina, E., Girotra, K. and Kabra, A., 2017. Online grocery retail: Revenue models and environmental impact. *Management Science*, 63(6), 1781-1799. <https://doi.org/10.1287/mnsc.2016.2430>
- Bergström, P., Malefors, C., Strid, I., Hanssen, O.J. and Eriksson, M., 2020. Sustainability assessment of food redistribution initiatives in Sweden. *Resources*, 9(3), 27. <https://doi.org/10.3390/resources9030027>
- Bhatt, S., Lee, J., Deutsch, J., Ayaz, H., Fulton, B. and Suri, R., 2018. From food waste to value-added surplus products (VASP): Consumer acceptance of a novel food product category. *Journal of Consumer Behaviour*, 17(1), 57-63. <https://doi.org/10.1002/cb.1689>
- Bilska, B., Piecek, M. and Kołożyn-Krajewska, D., 2018. A multifaceted evaluation of food waste in a Polish supermarket—Case study. *Sustainability*, 10(9), 3175. <https://doi.org/10.3390/su10093175>
- Bilska, B., Tomaszewska, M., Kołożyn-Krajewska, D., Szczepański, K., Łaba, R. and Łaba, S., 2020. Environmental aspects of food wastage in trade—a case study. *Environmental Protection and Natural Resources*, 31(2), 24-34. <https://doi.org/10.2478/oszn-2020-0009>
- Blanke, M., 2015. Challenges of reducing fresh produce waste in Europe—From farm to fork. *Agriculture*, 5(3), 389-399. <https://doi.org/10.3390/agriculture5030389>
- Bloomberg, L.D. and Volpe, M., 2018. *Completing your qualitative dissertation: A road map from beginning to end*. Sage Publications.
- Bobe, C.M. and Dragomir, V.D., 2010. The sustainability policy of five leading European retailers. *International Journal of Accounting & Information Management*, 19(2), 97-112. <https://doi.org/10.1108/ijaim.2011.36619baa.013>
- Borrello, M., Caracciolo, F., Lombardi, A., Pascucci, S. and Cembalo, L., 2017. Consumers' perspective on circular economy strategy for reducing food waste. *Sustainability*, 9(1), 141. <https://doi.org/10.3390/su9010141>
- Borrello, M., Pascucci, S., Caracciolo, F., Lombardi, A. and Cembalo, L., 2020. Consumers are willing to participate in circular business models: A practice theory perspective to food provisioning. *Journal of Cleaner Production*, 259, 121013. <https://doi.org/10.1016/j.jclepro.2020.121013>
- Borsellino, V., Kaliji, S. A. and Schimmenti, E., 2020. COVID-19 Drives Consumer Behaviour and Agro-Food Markets towards Healthier and More Sustainable Patterns. *Sustainability*, 12(20). <https://doi.org/10.3390/su12208366>
- Bortolini, M., Faccio, M., Ferrari, E., Gamberi, M. and Pilati, F., 2016. Fresh food sustainable distribution: cost, delivery time and carbon footprint three-objective optimization. *Journal of Food Engineering*, 174, 56-67. <https://doi.org/10.1016/j.jfoodeng.2015.11.014>
- Bottani, E., Vignali, G., Mosna, D. and Montanari, R., 2019. Economic and environmental assessment of different reverse logistics scenarios for food waste recovery. *Sustainable Production and Consumption*, 20, 289-303. <https://doi.org/10.1016/j.spc.2019.07.007>
- Brancoli, P., Lundin, M., Bolton, K. and Eriksson, M., 2019. Bread loss rates at the supplier-retailer interface—Analysis of risk factors to support waste prevention measures. *Resources, Conservation and Recycling*, 147, 128-136. <https://doi.org/10.1016/j.resconrec.2019.04.027>
- Bravi, L., Murmura, F., Savelli, E. and Viganò, E., 2019. Motivations and actions to prevent food waste among young Italian consumers. *Sustainability*, 11(4), 1110. <https://doi.org/10.3390/su11041110>

- Brščić, M., 2020. Refining consumer attitudes to milk and dairy product purchase and use to reduce food waste and improve animal welfare on-farm. *Journal of Dairy Research*, 87(S1), 9-12. <https://doi.org/10.1017/S0022029920000631>
- Burek, J. and Nutter, D.W., 2020. Environmental implications of perishables storage and retailing☆. *Renewable and Sustainable Energy Reviews*, 133, 110070. <https://doi.org/10.1016/j.rser.2020.110070>
- Buzby, J.C., Bentley, J.T., Padera, B., Ammon, C. and Campuzano, J., 2015. Estimated fresh produce shrink and food loss in US supermarkets. *Agriculture*, 5(3), 626-648. <https://doi.org/10.3390/agriculture5030626>
- Campbell, H., Evans, D. and Murcott, A., 2017. Measurability, austerity and edibility: Introducing waste into food regime theory. *Journal of Rural Studies*, 51, 168-177. <https://doi.org/10.1016/j.jrurstud.2017.01.017>
- Chauhan, C., Dhir, A., Akram, M.U. and Salo, J., 2021. Food loss and waste in food supply chains. A systematic literature review and framework development approach. *Journal of Cleaner Production*, 295, 126438. <https://doi.org/10.1016/j.jclepro.2021.126438>
- Chkanikova, O. and Mont, O., 2015. Corporate supply chain responsibility: Drivers and barriers for sustainable food retailing. *Corporate Social Responsibility and Environmental Management*, 22(2), 65-82. <https://doi.org/10.1002/csr.1316>
- Chung, J., 2019. Effective pricing of perishables for a more sustainable retail food market. *Sustainability*, 11(17), 4762. <https://doi.org/10.3390/su11174762>
- Cicatiello, C., Blasi, E., Giordano, C., Martella, A. and Franco, S., 2020. "If only I Could Decide": Opinions of Food Category Managers on in-Store Food Waste. *Sustainability*, 12(20), 8592. <https://doi.org/10.3390/su12208592>
- Cicatiello, C., Franco, S., Pancino, B. and Blasi, E., 2016. The value of food waste: An exploratory study on retailing. *Journal of Retailing and Consumer Services*, 30, 96-104. <https://doi.org/10.1016/j.jretconser.2016.01.004>
- Cicatiello, C., Franco, S., Pancino, B., Blasi, E. and Falasconi, L., 2017. The dark side of retail food waste: Evidences from in-store data. *Resources, Conservation and Recycling*, 125, 273-281. <https://doi.org/10.1016/j.resconrec.2017.06.010>
- Cicatiello, C., Secondi, L. and Principato, L., 2019. Investigating consumers' perception of discounted suboptimal products at retail stores. *Resources*, 8(3), 129. <https://doi.org/10.3390/resources8030129>
- Cooper, K.A., Quedstedt, T.E., Lanctuit, H., Zimmermann, D., Espinoza-Orias, N. and Roulin, A., 2018. Nutrition in the bin: a nutritional and environmental assessment of food wasted in the UK. *Frontiers in nutrition*, 5, 19. <https://doi.org/10.3389/fnut.2018.00019>
- Cooremans, K. and Geuens, M., 2019. Same but different: using anthropomorphism in the battle against food waste. *Journal of Public Policy & Marketing*, 38(2), 232-245. <https://doi.org/10.1177/0743915619827941>
- Craig, G., 2019. Sustainable everyday life and celebrity environmental advocacy in Hugh's War on Waste. *Environmental Communication*, 13(6), 775-789. <https://doi.org/10.1080/17524032.2018.1459770>
- Das, K., 2019. Integrating lean, green, and resilience criteria in a sustainable food supply chain planning model. *Int. J. Math. Eng. Manag. Sci.*, 4, 259-275. <https://doi.org/10.33889/ijmems.2019.4.2-022>
- De Hooge, I.E., Oostindjer, M., Aschemann-Witzel, J., Normann, A., Loose, S.M. and Almlí, V.L., 2017. This apple is too ugly for me!: Consumer preferences for suboptimal food products in the supermarket and at home. *Food Quality and Preference*, 56, 80-92. <https://doi.org/10.1016/j.foodqual.2016.09.012>
- Denyer, D., Tranfield, D., 2009. Producing a systematic review. *The SAGE Handbook of Organizational Research Methods*. Eds.; Sage Publications Ltd.: London, UK, 2009; 671-689.
- Díaz, A.I., Laca, A., Laca, A. and Díaz, M., 2017. Treatment of supermarket vegetable wastes to be used as alternative substrates in bioprocesses. *Waste Management*, 67, 59-66. <https://doi.org/10.1016/j.wasman.2017.05.018>
- Dome, M.M. and Prusty, S., 2017. Determination of vegetable postharvest loss in the last-mile supply chain in Tanzania: a lean perspective. *International Journal of Logistics Systems and Management*, 27(2), 133-150. <https://doi.org/10.1504/IJLSM.2017.083808>
- Duong, L.N., Wood, L.C. and Wang, W.Y., 2018. Effects of consumer demand, product lifetime, and substitution ratio on perishable inventory management. *Sustainability*, 10(5), 1559. <https://doi.org/10.3390/su10051559>
- Duret, S., Hoang, H.M., Derens-Bertheau, E., Delahaye, A., Laguerre, O. and Guillier, L., 2019. Combining quantitative risk assessment of human health, food waste, and energy consumption: The next step in the development of the food cold chain?. *Risk Analysis*, 39(4), 906-925. <https://doi.org/10.1111/risa.13199>
- Eberle, U. and Fels, J., 2016. Environmental impacts of German food consumption and food losses. *The International Journal of Life Cycle Assessment*, 21(5), 759-772. <https://doi.org/10.1007/s11367-015-0983-7>

- Eriksson, M., Ghosh, R., Mattsson, L. and Ismatov, A., 2017. Take-back agreements in the perspective of food waste generation at the supplier-retailer interface. *Resources, Conservation and Recycling*, 122, pp.83-93. <https://doi.org/10.1016/j.resconrec.2017.02.006>
- Eriksson, M. and Spångberg, J., 2017. Carbon footprint and energy use of food waste management options for fresh fruit and vegetables from supermarkets. *Waste Management*, 60, 786-799. <https://doi.org/10.1016/j.wasman.2017.01.008>
- Eriksson, M., Strid, I. and Hansson, P.A., 2014. Waste of organic and conventional meat and dairy products—A case study from Swedish retail. *Resources, Conservation and Recycling*, 83, 44-52. <https://doi.org/10.1016/j.resconrec.2013.11.011>
- Eriksson, M., Strid, I. and Hansson, P.A., 2016. Food waste reduction in supermarkets—Net costs and benefits of reduced storage temperature. *Resources, Conservation and Recycling*, 107, 73-81. <https://doi.org/10.1016/j.resconrec.2015.11.022>
- Espinoza-Orias, N. and Azapagic, A., 2018. Understanding the impact on climate change of convenience food: Carbon footprint of sandwiches. *Sustainable Production and Consumption*, 15, 1-15. <https://doi.org/10.1016/j.spc.2017.12.002>
- European Commission, 2018. Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 Amending Directive 2008/98/EC on Waste. Official Journal of the European Union. L150/109. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2018:150:FULL&from=EN>. (Accessed 3 September 2018).
- Evans, D., 2015. Researching (with) Major Food Retailers: Leveling and Leveraging the Terms of Engagement. *Gastronomica: The Journal of Food and Culture*, 15(3), 33-39. <https://doi.org/10.1525/gfc.2015.15.3.33>
- Evans-Cowley, J.S. and Arroyo-Rodríguez, A., 2013. Integrating food waste diversion into food systems planning: A case study of the Mississippi Gulf Coast. *Journal of Agriculture, Food Systems, and Community Development*, 3(3), 167-185. <https://doi.org/10.5304/jafscd.2013.033.003>
- Fabbri, S., Olsen, S.I. and Owsianiak, M., 2018. Improving environmental performance of post-harvest supply chains of fruits and vegetables in Europe: Potential contribution from ultrasonic humidification. *Journal of Cleaner Production*, 182, 16-26. <https://doi.org/10.1016/j.jclepro.2018.01.157>
- Fancello, G., Mola, F., Frigau, L., Serra, P., Mancini, S. and Fadda, P., 2017. A new management scheme to support reverse logistics processes in the agrifood distribution sector. *Transportation research procedia*, 25, 695-715. <https://doi.org/10.1016/j.trpro.2017.05.452>
- FAO, 2019. The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction. <https://www.fao.org/3/ca6030en/ca6030en.pdf> (Accessed 25 November 2020).
- Ferreira, J., 2018. Fostering sustainable behaviour in retail: looking beyond the coffee cup. *Social Business*, 8(1), 21-28. <https://doi.org/10.1362/204440818X15208755029519>
- Filipová, A., Mokrejšová, V., Šulc, Z. and Zeman, J., 2017. Characteristics of food-wasting consumers in the Czech Republic. *International Journal of Consumer Studies*, 41(6), 714-722. <https://doi.org/10.1111/ijcs.12384>
- Finlayson, C., 2018. Perfect food: perspectives on consumer perceptions of fresh produce quality. *Fennia*, 196(2), 168-186. <https://doi.org/10.11143/fennia.65645>
- Fiore, M., Conte, A. and Conto, F., 2015. Retailers towards zero-waste: A walkthrough survey in Italy. *Italian Journal of Food Science*, 92.
- Garnett, T., 2013. Food sustainability: problems, perspectives and solutions. *Proceedings of the Nutrition Society*, 72(1), 29-39. <https://doi.org/10.1017/S0029665112002947>
- Gautam, S., Acedo Jr, A.L., Schreinemachers, P. and Subedi, B.P., 2017. Volume and value of postharvest losses: the case of tomatoes in Nepal. *British Food Journal*. <https://doi.org/10.1108/BFJ-12-2016-0632>
- Ghinea, C. and Ghiuta, O.A., 2019. Household food waste generation: young consumers' behaviour, habits and attitudes. *International Journal of Environmental Science and Technology*, 16(5), 2185-2200. <https://doi.org/10.1177/0734242X14521681>
- Ghosh, R. and Eriksson, M., 2019. Food waste due to retail power in supply chains: Evidence from Sweden. *Global Food Security*, 20, 1-8. <https://doi.org/10.1016/j.gfs.2018.10.002>
- Ghosh, P.R., Fawcett, D., Sharma, S.B. and Poinern, G.E.J., 2016. Progress towards sustainable utilisation and management of food wastes in the global economy. *International journal of food science*, 2016. <https://doi.org/10.1155/2016/3563478>
- Giroto, F., Alibardi, L. and Cossu, R., 2015. Food waste generation and industrial uses: a review. *Waste management*, 45, 32-41. <https://doi.org/10.1016/j.wasman.2015.06.008>

- Glover, J.L., Champion, D., Daniels, K.J. and Dainty, A.J., 2014. An Institutional Theory perspective on sustainable practices across the dairy supply chain. *International Journal of Production Economics*, 152, 102-111.
- Gollnhofer, J.F. and Schouten, J.W., 2017. Complementing the dominant social paradigm with sustainability. *Journal of macromarketing*, 37(2), 143-152. <https://doi.org/10.1177/0276146717696892>
- Gollnhofer, J.F., 2017a. Normalising alternative practices: the recovery, distribution and consumption of food waste. *Journal of Marketing Management*, 33(7-8), 624-643. <https://doi.org/10.1080/0267257X.2017.1301982>
- Gollnhofer, J.F., 2017b. The legitimization of a sustainable practice through dialectical adaptation in the marketplace. *Journal of Public Policy & Marketing*, 36(1), 156-168. <https://doi.org/10.1509/jppm.15.090>
- Gollnhofer, J.F., Weijo, H.A. and Schouten, J.W., 2019. Consumer movements and value regimes: Fighting food waste in Germany by building alternative object pathways. *Journal of Consumer Research*, 46(3), 460-482. <https://doi.org/10.1093/jcr/ucz004>
- Goodman-Smith, F., Miroso, M. and Skeaff, S., 2020. A mixed-methods study of retail food waste in New Zealand. *Food Policy*, 92, 101845. <https://doi.org/10.1016/j.foodpol.2020.101845>
- Govindan, K., 2018. Sustainable consumption and production in the food supply chain: A conceptual framework. *International Journal of Production Economics*, 195, 419-431. <https://doi.org/10.1016/j.ijpe.2017.03.003>
- Gruber, V., Holweg, C. and Teller, C., 2016. What a waste! Exploring the human reality of food waste from the store manager's perspective. *Journal of Public Policy & Marketing*, 35(1), 3-25. <https://doi.org/10.1509/jppm.14.095>
- Hadaway, A., Tassou, S.A., Chaer, I. and Sundararajan, R., 2017. Unwrapped food product display shelf life assessment. *Energy Procedia*, 123, 62-69. <https://doi.org/10.1016/j.egypro.2017.07.233>
- Heard, B.R. and Miller, S.A., 2018. Potential changes in greenhouse gas emissions from refrigerated supply chain introduction in a developing food system. *Environmental science & technology*, 53(1), 251-260. <https://doi.org/10.1021/acs.est.8b05322>
- Horton, P., Banwart, S.A., Brockington, D., Brown, G.W., Bruce, R., Cameron, D., Holdsworth, M., Koh, S.L., Ton, J. and Jackson, P., 2017. An agenda for integrated system-wide interdisciplinary agri-food research. *Food Security*, 9(2), 195-210. <https://doi.org/10.1007/s12571-017-0648-4>
- Huang, H., He, Y. and Li, D., 2018. Pricing and inventory decisions in the food supply chain with production disruption and controllable deterioration. *Journal of Cleaner Production*, 180, 280-296. <https://doi.org/10.1016/j.jclepro.2018.01.152>
- Huang, I.Y., Manning, L., James, K.L., Grigoriadis, V., Millington, A., Wood, V. and Ward, S., 2021. Food waste management: A review of retailers' business practices and their implications for sustainable value. *Journal of Cleaner Production*, 285, 125484. <https://doi.org/10.1016/j.jclepro.2020.125484>
- Ingram, J.S., Wright, H.L., Foster, L., Aldred, T., Barling, D., Benton, T.G., Berryman, P.M., Bestwick, C.S., Bows-Larkin, A., Brocklehurst, T.F. and Buttriss, J., 2013. Priority research questions for the UK food system. *Food Security*, 5(5), 617-636.
- Janssens, K., Lambrechts, W., van Osch, A. and Semeijn, J., 2019. How consumer behavior in daily food provisioning affects food waste at household level in The Netherlands. *Foods*, 8(10), p.428. <https://doi.org/10.3390/foods8100428>
- Jensen, J.K., Munksgaard, K.B. and Arlbjørn, J.S., 2013. Chasing value offerings through green supply chain innovation. *European Business Review*. <https://doi.org/10.1108/09555341311302657>
- Jones, G.R. and Jones, G.R., 2013. *Organizational theory, design, and change* (31-33). Boston: Pearson.
- Katajajuuri, J.M., Silvennoinen, K., Hartikainen, H., Heikkilä, L. and Reinikainen, A., 2014. Food waste in the Finnish food chain. *Journal of Cleaner Production*, 73, 322-329. <https://doi.org/10.1016/j.jclepro.2013.12.057>
- Kato, T., Tran, A.Q. and Hoang, H., 2017. Waste generation in traditional organized bazaars: A case study of organic waste sources in Da Nang City, Viet Nam. *Journal of Material Cycles and Waste Management*, 19(2), 977-987. <https://doi.org/10.1007/s10163-015-0453-0>
- Kazimierowicz, J., 2018. Legal Regulations and Methods Neutralising Expired Food Products. *Journal of Ecological Engineering*, 19(6). <https://doi.org/10.12911/22998993/89828>
- Kc, K.B., Haque, I., Legwegoh, A.F. and Fraser, E.D., 2016. Strategies to reduce food loss in the global South. *Sustainability*, 8(7), p.595. <https://doi.org/10.3390/su8070595>

- Kiil, K., Dreyer, H.C., Hvolby, H.H. and Chabada, L., 2018. Sustainable food supply chains: the impact of automatic replenishment in grocery stores. *Production Planning & Control*, 29(2), 106-116. <https://doi.org/10.1080/09537287.2017.1384077>
- Kikulwe, E.M., Okurut, S., Ajambo, S., Nowakunda, K., Stoian, D. and Naziri, D., 2018. Postharvest losses and their determinants: A challenge to creating a sustainable cooking banana value chain in Uganda. *Sustainability*, 10(7), p.2381. <https://doi.org/10.3390/su10072381>
- Koivupuro, H.K., Hartikainen, H., Silvennoinen, K., Katajajuuri, J.M., Heikintalo, N., Reinikainen, A. and Jalkanen, L., 2012. Influence of socio-demographical, behavioural and attitudinal factors on the amount of avoidable food waste generated in Finnish households. *International journal of consumer studies*, 36(2), 183-191. <https://doi.org/10.1111/j.1470-6431.2011.01080.x>
- Kor, Y.Y., Prabhu, J. and Esposito, M., 2017. How large food retailers can help solve the food waste crisis. *HBR.org*, December, 19, p.2017.
- Kornfeld, D., 2014. Bringing good food in: A history of New York City's greenmarket program. *Journal of Urban History*, 40(2), 345-356. <https://doi.org/10.1177/0096144213510162>
- Kowalczyk, D., Kordowska-Wiater, M., Zięba, E. and Baraniak, B., 2017. Effect of carboxymethylcellulose/candelilla wax coating containing potassium sorbate on microbiological and physicochemical attributes of pears. *Scientia Horticulturae*, 218, 326-333. <https://doi.org/10.1016/j.scienta.2017.02.040>
- Kulikovskaja, V. and Aschemann-Witzel, J., 2017. Food waste avoidance actions in food retailing: The case of Denmark. *Journal of international food & agribusiness marketing*, 29(4), 328-345. <https://doi.org/10.1080/08974438.2017.1350244>
- Kumar, A., 2014. Left Out in the Cold: The Case of Potato Cold Stores in West Bengal. *IUP Journal of Supply Chain Management*, 11(2).
- Le Roux, B., Van der Laan, M., Vahrmeijer, T., Annandale, J.G. and Bristow, K.L., 2018. Water footprints of vegetable crop wastage along the supply chain in Gauteng, South Africa. *Water*, 10(5), p.539. <https://doi.org/10.3390/w10050539>
- Lebersorger, S. and Schneider, F., 2014. Food loss rates at the food retail, influencing factors and reasons as a basis for waste prevention measures. *Waste Management*, 34(11), 1911-1919. <https://doi.org/10.1016/j.wasman.2014.06.013>
- Lee, D. and Tongarlak, M.H., 2017. Converting retail food waste into by-product. *European Journal of Operational Research*, 257(3), 944-956. <https://doi.org/10.1016/j.ejor.2016.08.022>
- Leithner, M. and Fikar, C., 2019. A simulation model to investigate impacts of facilitating quality data within organic fresh food supply chains. *Annals of Operations Research*, 1-22. <https://doi.org/10.1007/s10479-019-03455-0>
- Liberti, F., Pistolesi, V., Massoli, S., Bartocci, P., Bidini, G. and Fantozzi, F., 2018. i-REXFO LIFE: an innovative business model to reduce food waste. *Energy Procedia*, 148, 439-446. <https://doi.org/10.1016/j.egypro.2018.08.118>
- Lindeman, S., 2012. Trash eaters. *Gastronomica: The Journal of Food and Culture*, 12(1), 75-82. <https://doi.org/10.1525/GFC.2012.12.1.75>
- López-Gómez, A., Ros-Chumillas, M., Buendía-Moreno, L. and Martínez-Hernández, G.B., 2020. Active cardboard packaging with encapsulated essential oils for enhancing the shelf life of fruit and vegetables. *Frontiers in Nutrition*, 7. <https://doi.org/10.3389/fnut.2020.559978>
- Lombardi, M. and Costantino, M., 2020. A social innovation model for reducing food waste: The case study of an Italian non-profit organization. *Administrative Sciences*, 10(3), 45. <https://doi.org/10.3390/admsci10030045>
- Love, D.C., Fry, J.P., Milli, M.C. and Neff, R.A., 2015. Wasted seafood in the United States: Quantifying loss from production to consumption and moving toward solutions. *Global Environmental Change*, 35, 116-124. <https://doi.org/10.1016/j.gloenvcha.2015.08.013>
- Ludwig-Ohm, S., Dirksmeyer, W. and Klockgether, K., 2019. Approaches to Reduce Food Losses in German Fruit and Vegetable Production. *Sustainability*, 11(23), 6576. <https://doi.org/10.3390/su11236576>
- Mack, A., Hutton, R., Olsen, L., Relman, D.A. and Choffnes, E.R. eds., 2012. *Improving food safety through a one health approach: workshop summary*. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK114491/> (Accessed: 06/07/2020)
- Managa, M.G., Tinyani, P.P., Senyolo, G.M., Soundy, P., Sultanbawa, Y. and Sivakumar, D., 2018. Impact of transportation, storage, and retail shelf conditions on lettuce quality and phytonutrients losses in the supply chain. *Food science & nutrition*, 6(6), 1527-1536. <https://doi.org/10.1002/fsn3.685>

- Marx-Pienaar, N.J. and Erasmus, A.C., 2014. Status consciousness and knowledge as potential impediments of households' sustainable consumption practices of fresh produce amidst times of climate change. *International Journal of Consumer Studies*, 38(4), 419-426. <https://doi.org/10.1111/ijcs.12111>
- Maye, D., Kirwan, J. and Brunori, G., 2019. Ethics and responsabilisation in agri-food governance: the single-use plastics debate and strategies to introduce reusable coffee cups in UK retail chains. *Agriculture and human values*, 36(2), 301-312. <https://doi.org/10.1007/s10460-019-09922-5>
- McAuley, J., Duberley, J. and Johnson, P., 2007. *Organization theory: Challenges and perspectives*. Pearson Education.
- Mena, C., Terry, L.A., Williams, A. and Ellram, L., 2014. Causes of waste across multi-tier supply networks: Cases in the UK food sector. *International Journal of Production Economics*, 152, 144-158. <https://doi.org/10.1016/j.ijpe.2014.03.012>
- Michelini, L., Principato, L. and Iasevoli, G., 2018. Understanding food sharing models to tackle sustainability challenges. *Ecological Economics*, 145, 205-217. <https://doi.org/10.1016/j.ecolecon.2017.09.009>
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G. and The PRISMA Group, 2009. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLOS Medicine*, 6 (7), 1-6.
- Mondéjar-Jiménez, J.A., Ferrari, G., Secondi, L. and Principato, L., 2016. From the table to waste: An exploratory study on behaviour towards food waste of Spanish and Italian youths. *Journal of Cleaner Production*, 138, 8-18. <https://doi.org/10.1016/j.jclepro.2016.06.018>
- Mondello, G., Salomone, R., Ioppolo, G., Saija, G., Sparacia, S. and Lucchetti, M.C., 2017. Comparative LCA of alternative scenarios for waste treatment: The case of food waste production by the mass-retail sector. *Sustainability*, 9(5), 827. <https://doi.org/10.3390/su9050827>
- Moraes, C.C., de Oliveira Costa, F.H., Pereira, C.R., da Silva, A.L. and Delai, I., 2020. Retail food waste: Mapping causes and reduction practices. *Journal of Cleaner Production*, 256, 120124. <https://doi.org/10.1016/j.jclepro.2020.120124>
- Moraes, C.C., Costa, F.H.D.O., Silva, A.L.D., Delai, I. and Pereira, C.R., 2019. Does resilience influence food waste causes? A systematic literature review. *Gestão & Produção*, 26(3), 1-17. <https://doi.org/10.1590/0104-530X4474-19>
- Moran, A.J., Khandpur, N., Polacsek, M. and Rimm, E.B., 2019. What factors influence ultra-processed food purchases and consumption in households with children? A comparison between participants and non-participants in the Supplemental Nutrition Assistance Program (SNAP). *Appetite*, 134, 1-8. <https://doi.org/10.1016/j.appet.2018.12.009>
- Moult, J.A., Allan, S.R., Hewitt, C.N. and Berners-Lee, M., 2018. Greenhouse gas emissions of food waste disposal options for UK retailers. *Food Policy*, 77, 50-58. <https://doi.org/10.1016/j.foodpol.2018.04.003>
- Mozos, E.A., Badurdeen, F. and Dossou, P.E., 2020. Sustainable consumption by reducing food waste: A review of the current state and directions for future research. *Procedia Manufacturing*, 51, 1791-1798. <https://doi.org/10.1016/j.promfg.2020.10.249>
- Mullick, S., Raassens, N., Haans, H. and Nijssen, E.J., 2021. Reducing food waste through digital platforms: a quantification of cross-side network effects. *Industrial Marketing Management*, 93, 533-544. <https://doi.org/10.1016/j.indmarman.2020.09.021>
- Ng, K.S., Yang, A. and Yakovleva, N., 2019. Sustainable waste management through synergistic utilisation of commercial and domestic organic waste for efficient resource recovery and valorisation in the UK. *Journal of Cleaner Production*, 227, 248-262. <https://doi.org/10.1016/j.jclepro.2019.04.136>
- Nosratabadi, S., Mosavi, A. and Lakner, Z., 2020. Food Supply Chain and Business Model Innovation. *Foods*, 9(2), p.132.
- Nunes, M.C.N., Emond, J.P., Dea, S. and Yagiz, Y., 2011. Distribution center and retail conditions affect the sensory and compositional quality of bulk and packaged slicing cucumbers. *Postharvest biology and technology*, 59(3), 280-288. <https://doi.org/10.1016/j.postharvbio.2010.10.004>
- Núñez-Cacho, P., Molina-Moreno, V., Corpas-Iglesias, F.A. and Cortés-García, F.J., 2018. Family businesses transitioning to a circular economy model: The case of “Mercadona”. *Sustainability*, 10(2), 538. <https://doi.org/10.3390/su10020538>
- Ocicka, B. and Rażniewska, M., 2018. Food waste reduction as a challenge in supply chains management. *LogForum*, 14(4), 549-561. <https://doi.org/10.17270/J.LOG.2018.303>
- Olson, E., Liu, F., Bahns, T., Jiang, S., Vorst, K. and Curtzwiler, G., 2020. Post-consumer polymers (PCR) for color retention of delicatessen meats and elucidation of the light blocking mechanism. *Sustainable Materials and Technologies*, 25, e00193. <https://doi.org/10.1016/j.susmat.2020.e00193>

- Østergaard, S. and Hanssen, O.J., 2018. Wasting of fresh-packed bread by consumers—influence of shopping behavior, storing, handling, and consumer preferences. *Sustainability*, 10(7), 2251. <https://doi.org/10.3390/su10072251>
- Östergren, K.; Gustavsson, J.; Bos-Brouwers, H.; Timmermans, T.; Hansen, O.-J.; Møller, H.; Anderson, G.; O'Connor, C.; Soethoudt, H.; Quested, T.; et al., 2014. *FUSIONS Definitional Framework for Food Waste*; Wageningen University Publishing: Wageningen, The Netherlands.
- Özbük, R.M.Y. and Coşkun, A., 2020. Factors affecting food waste at the downstream entities of the supply chain: A critical review. *Journal of Cleaner Production*, 244, p.118628.
- Pacilly, F.C., Groot, J.C., Hofstede, G.J., Schaap, B.F. and van Bueren, E.T.L., 2016. Analyzing potato late blight control as a social-ecological system using fuzzy cognitive mapping. *Agronomy for sustainable development*, 36(2), 35. <https://doi.org/10.1007/s13593-016-0370-1>
- Pateman, R.M., De Bruin, A., Piirsalu, E., Reynolds, C., Stokeld, E. and West, S.E., 2020. Citizen science for quantifying and reducing food loss and food waste. *Frontiers in Sustainable Food Systems*, 4, 589089. <https://doi.org/10.3389/fsufs.2020.589089>
- Peira, G., Bollani, L., Giachino, C. and Bonadonna, A., 2018. The management of unsold food in outdoor market areas: food operators' behaviour and attitudes. *Sustainability*, 10(4), 1180. <https://doi.org/10.3390/su10041180>
- Phillips, C., Hoenigman, R., Higbee, B. and Reed, T., 2013. Understanding the sustainability of retail food recovery. *PLOS one*, 8(10), e75530. <https://doi.org/10.1371/journal.pone.0075530>
- Porter, S.D., Reay, D.S., Bomberg, E. and Higgins, P., 2018. Avoidable food losses and associated production-phase greenhouse gas emissions arising from application of cosmetic standards to fresh fruit and vegetables in Europe and the UK. *Journal of Cleaner Production*, 201, 869-878. <https://doi.org/10.1016/j.jclepro.2018.08.079>
- Potts Dawson, A., 2011. Accidental expert: Experiments in sustainable restaurants and food retailing. *Journal of Urban Regeneration & Renewal*, 4(4), 388-395.
- Quested, T.E., Parry, A.D., Easteal, S. and Swannell, R., 2011. Food and drink waste from households in the UK. *Nutrition Bulletin*, 36, 460. <https://doi.org/10.1111/j.1467-3010.2011.01924.x>
- Rajagopal, S. and Bansal, I., 2015. Waste disposal of fresh fruits and vegetables: a study of consumers' awareness levels in the United Arab Emirates (The UAE). *Management of Environmental Quality: An International Journal*, 26(5), 721-738. <https://doi.org/10.1108/MEQ-10-2013-0115>
- Rastoin, J.L. (2012) The agri-food industry at the heart of the global food system. Available at: <http://regardssurlaterre.com/en/agri-food-industry-heart-global-food-system> (accessed: 05/10/2020).
- Ratinger, T., Tomka, A., and Boskova, I., 2016. Sustainable consumption of bakery products; a challenge for Czech consumers and producers. *Agricultural Economics*, 62(10), 447-458. <https://doi.org/10.17221/244/2015-AGRICECON>
- Redlingshöfer, B., Coudurier, B. and Georget, M., 2017. Quantifying food loss during primary production and processing in France. *Journal of Cleaner Production*, 164, 703-714. <https://doi.org/10.1016/j.jclepro.2017.06.173>
- Reynolds, C., Goucher, L., Quested, T., Bromley, S., Gillick, S., Wells, V.K., Evans, D., Koh, L., Kanyama, A.C., Katzeff, C. and Svenfelt, Å., 2019. Consumption-stage food waste reduction interventions—What works and how to design better interventions. *Food policy*, 83, 7-27. <https://doi.org/10.1016/j.foodpol.2019.01.009>
- Ribeiro, A.P., Rok, J., Harmsen, R., Carreón, J.R. and Worrell, E., 2019. Food waste in an alternative food network—A case-study. *Resources, Conservation and Recycling*, 149, 210-219. <https://doi.org/10.1016/j.resconrec.2019.05.029>
- Ribeiro, I., Sobral, P., Peças, P. and Henriques, E., 2018. A sustainable business model to fight food waste. *Journal of cleaner production*, 177, 262-275. <https://doi.org/10.1016/j.jclepro.2017.12.200>
- Roe, B.E., Qi, D., Bender, K.E. and Hilty, J., 2019. Industry versus Government Regulation of Food Date Labels: Observed Adherence to Industry-Endorsed Phrases. *Sustainability*, 11(24), 7183. <https://doi.org/10.3390/su11247183>
- Rohm, H., Oostindjer, M., Aschemann-Witzel, J., Symmank, C., L Almli, V., De Hooge, I.E., Normann, A. and Karantininis, K., 2017. Consumers in a sustainable food supply chain (COSUS): understanding consumer behavior to encourage food waste reduction. *Foods*, 6(12), 104. <https://doi.org/10.3390/foods6120104>
- Sakoda, G., Takayasu, H. and Takayasu, M., 2019. Data science solutions for retail strategy to reduce waste keeping high profit. *Sustainability*, 11(13), 3589. <https://doi.org/10.3390/su11133589>
- Savitz, A. W. and Weber, K., 2013. *The triple bottom line: how today's best-run companies are achieving economic, social, and environmental success--and how you can too*. Jossey-Bass. 1-352.

- Schanes, K., Dobernig, K. and Gözet, B., 2018. Food waste matters-A systematic review of household food waste practices and their policy implications. *Journal of Cleaner Production*, 182, 978-991. <https://doi.org/10.1016/j.jclepro.2018.02.030>
- Scherhauer, S., Moates, G., Hartikainen, H., Waldron, K. and Obersteiner, G., 2018. Environmental impacts of food waste in Europe. *Waste management*, 77, 98-113. <https://doi.org/10.1016/j.wasman.2018.04.038>
- Schneider, F., 2013. Review of food waste prevention on an international level', *Waste & Resource Management. Proceedings of the Institution of Civil Engineers*, 166(4), 187–203. <https://doi.org/10.1680/warm.13.00016>
- Scholz, K., Eriksson, M. and Strid, I., 2015. Carbon footprint of supermarket food waste. *Resources, Conservation and Recycling*, 94, 56-65. <https://doi.org/10.1016/j.resconrec.2014.11.016>
- Schulz, S.A. and Flanigan, R.L., 2016. Developing competitive advantage using the triple bottom line: A conceptual framework. *Journal of Business & Industrial Marketing*, 31(4), 449–458. <https://doi.org/10.1108/JBIM-08-2014-0150>
- Secondi, L., Principato, L., Ruini, L. and Guidi, M., 2019. Reusing food waste in food manufacturing companies: the case of the tomato-sauce supply Chain. *Sustainability*, 11(7), 2154. <https://doi.org/10.3390/su11072154>
- Sedlmeier, R., Rombach, M. and Bitsch, V., 2019. Making food rescue your business: Case studies in Germany. *Sustainability*, 11(18), 5101. <https://doi.org/10.3390/su11185101>
- Selvaraju, M. and Arokiasamy, L., 2019. Inaccurate Forecasting Planning Nurture Inventory Wastage (Perishable Items) in the Hypermarket Retail. *Global Business and Management Research*, 11(1), 478-487.
- Soma, T., 2017. Gifting, ridding and the “everyday mundane”: the role of class and privilege in food waste generation in Indonesia. *Local Environment*, 22(12), 1444-1460. <https://doi.org/10.1080/13549839.2017.1357689>
- Soysal, M., Bloemhof-Ruwaard, J.M., Haijema, R. and van der Vorst, J.G., 2015. Modeling an inventory routing problem for perishable products with environmental considerations and demand uncertainty. *International Journal of Production Economics*, 164, 118-133. <https://doi.org/10.1016/j.ijpe.2015.03.008>
- Sundgren, C., 2020. Supply chain structures for distributing surplus food. *The International Journal of Logistics Management*, 31(4), 865–883. <https://doi.org/10.1108/IJLM-10-2019-0267>
- Sustainable Development Commission, 2008. *Green, healthy and fair: A review of government's role in supporting sustainable supermarket food*. London: Competition Commission.
- Svanes, E., Oestergaard, S. and Hanssen, O.J., 2019. Effects of packaging and food waste prevention by consumers on the environmental impact of production and consumption of bread in Norway. *Sustainability*, 11(1), 43. <https://doi.org/10.3390/su11010043>
- Swaffield, J., Evans, D. and Welch, D., 2018. Profit, reputation and ‘doing the right thing’: Convention theory and the problem of food waste in the UK retail sector. *Geoforum*, 89, 43-51. <https://doi.org/10.1016/j.geoforum.2018.01.002>
- Tanios, S., Eyles, A., Corkrey, R., Tegg, R.S., Thangavel, T. and Wilson, C.R., 2020. Quantifying risk factors associated with light-induced potato tuber greening in retail stores. *PloS one*, 15(9), e0235522. <https://doi.org/10.1371/journal.pone.0235522>
- Teller, C., Holweg, C., Reiner, G. and Kotzab, H., 2018. Retail store operations and food waste. *Journal of Cleaner Production*, 185, 981-997. <https://doi.org/10.1016/j.jclepro.2018.02.280>
- Tikka, V., 2019. Charitable food aid in Finland: from a social issue to an environmental solution. *Agriculture and human values*, 36(2), pp.341-352. <https://doi.org/10.1007/s10460-019-09916-3>
- Tjärnemo, H. and Södahl, L., 2015. Swedish food retailers promoting climate smarter food choices—trapped between visions and reality?. *Journal of Retailing and Consumer Services*, 24, pp.130-139. <https://doi.org/10.1016/j.jretconser.2014.12.007>
- Tostivint, C., de Veron, S., Jan, O., Lanctuit, H., Hutton, Z.V. and Loubière, M., 2017. Measuring food waste in a dairy supply chain in Pakistan. *Journal of Cleaner Production*, 145, 221-231. <https://doi.org/10.1016/j.jclepro.2016.12.081>
- Tranfield, D., Denyer, D. and Smart, P., 2003. Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British journal of management*, 14(3), 207-222.
- United Nations, 2020. Fighting Food Waste Means Fighting Climate Change. <https://unfccc.int/news/fighting-food-waste-means-fighting-climate-change> (accessed 17 January 2021)
- UN General Assembly, 2015. Transforming our world: the 2030 Agenda for Sustainable Development. <https://sdgs.un.org/2030agenda> (accessed 20 November 2020)
- Venkat, K., 2011. The climate change and economic impacts of food waste in the United States. *International Journal on Food System Dynamics*, 2(4), 431-446. <https://doi.org/10.18461/ijfsd.v2i4.247>

- Venkatesh, G., Nyflött, Å., Bonnerup, C. and Lestelius, M., 2018. An economic-environmental analysis of selected barrier-coating materials used in packaging food products: a Swedish case study. *Environment, Development and Sustainability*, 20(4), 1483-1497. <https://doi.org/10.1007/s10668-017-9948-2>
- Vergheze, K., Lewis, H., Lockrey, S. and Williams, H., 2015. Packaging's role in minimizing food loss and waste across the supply chain. *Packaging Technology and Science*, 28(7), 603-620. <https://doi.org/10.1002/pts.2127>
- Vinyes, E., Asin, L., Alegre, S., Muñoz, P., Boschmonart, J. and Gasol, C.M., 2017. Life Cycle Assessment of apple and peach production, distribution and consumption in Mediterranean fruit sector. *Journal of Cleaner Production*, 149, 313-320. <https://doi.org/10.1016/j.jclepro.2017.02.102>
- Vitale, G., Mosna, D., Bottani, E., Montanari, R. and Vignali, G., 2018. Environmental impact of a new industrial process for the recovery and valorisation of packaging materials derived from packaged food waste. *Sustainable Production and Consumption*, 14, 105-121. <https://doi.org/10.1016/j.spc.2018.02.001>
- Vittuari, M., Falasconi, L., Masotti, M., Piras, S., Segrè, A. and Setti, M., 2020. 'Not in My Bin': Consumer's Understanding and Concern of Food Waste Effects and Mitigating Factors. *Sustainability*, 12(14), 5685. <https://doi.org/10.3390/su12145685>
- Wang, M., Cao, J., Lin, L., Sun, J. and Jiang, W., 2010. Effect of 1-methylcyclopropene on nutritional quality and antioxidant activity of tomato fruit (*Solanum lycopersicon* L.) during storage. *Journal of Food Quality*, 33(2), 150-164. <https://doi.org/10.1111/j.1745-4557.2010.00308.x>
- Wang, X., Rodrigues, V.S. and Demir, E., 2019. Managing your supply chain pantry: Food waste mitigation through inventory control. *IEEE Engineering Management Review*, 47(2), 97-102. <https://doi.org/10.1109/EMR.2019.2915064>
- Warshawsky, D.N., 2016. Food waste, sustainability, and the corporate sector: Case study of a US food company. *The Geographical Journal*, 182(4), 384-394. <https://doi.org/10.1111/geoj.12156>
- Welch, D., Swaffield, J. and Evans, D., 2018. Who's responsible for food waste? Consumers, retailers and the food waste discourse coalition in the United Kingdom. *Journal of Consumer Culture*, <https://doi.org/10.1177/1469540518773801>.
- White, A., Gallegos, D. and Hundloe, T., 2011. The impact of fresh produce specifications on the Australian food and nutrition system: a case study of the north Queensland banana industry. *Public Health Nutrition*, 14(8), 1489-1495. <https://doi.org/10.1017/S1368980010003046>
- Wielicka-Regulska, A., 2020. The Relationship Between Consumer Behaviour, Attitudes and Acceptance of Public Policy Tools Advancing Sustainable Food Consumption. *Folia Oeconomica Stetinensia*, 20(2). <https://doi.org/10.2478/fofi-2020-0058>.
- Wikström, F., Vergheze, K., Auras, R., Olsson, A., Williams, H., Wever, R., Grönman, K., Kvalvåg Pettersen, M., Møller, H. and Soukka, R., 2019. Packaging strategies that save food: A research agenda for 2030. *Journal of Industrial Ecology*, 23(3), 532-540. <https://doi.org/10.1111/jiec.12769>
- Willersinn, C., Mouron, P., Mack, G. and Siegrist, M., 2017. Food loss reduction from an environmental, socio-economic and consumer perspective—The case of the Swiss potato market. *Waste management*, 59, 451-464. <https://doi.org/10.1016/j.wasman.2016.10.007>
- Wu, G. C., Ding, J. H., & Chen, P. S., 2012. The effects of GSCM drivers and institutional pressures on GSCM practices in Taiwan's textile and apparel industry. *International Journal of Production Economics*, 135(2), 618-636. <https://doi.org/10.1016/j.ijpe.2011.05.023>
- Wu, W., Beretta, C., Cronje, P., Hellweg, S. and Defraeye, T., 2019. Environmental trade-offs in fresh-fruit cold chains by combining virtual cold chains with life cycle assessment. *Applied Energy*, 254, 113586. <https://doi.org/10.1016/j.apenergy.2019.113586>
- Xue, L., Prass, N., Gollnow, S., Davis, J., Scherhauer, S., Östergren, K., Cheng, S. and Liu, G., 2019. Efficiency and carbon footprint of the German meat supply chain. *Environmental science & technology*, 53(9), 5133-5142. <https://doi.org/10.1021/acs.est.8b06079>
- Yang, S., Xiao, Y. and Kuo, Y.H., 2017. The supply chain design for perishable food with stochastic demand. *Sustainability*, 9(7), 1195. <https://doi.org/10.3390/su9071195>
- Yngfalk, C., 2019. Subverting sustainability: market maintenance work and the reproduction of corporate irresponsibility. *Journal of Marketing Management*, 35(17-18), 1563-1583. <https://doi.org/10.1080/0267257X.2019.1682031>
- Young, C.W., Russell, S.V., Robinson, C.A. and Chintakayala, P.K., 2018. Sustainable retailing—influencing consumer behaviour on food waste. *Business Strategy and the Environment*, 27(1), 1-15. <https://doi.org/10.1002/bse.1966>

- Young, W., Russell, S.V., Robinson, C.A. and Barkemeyer, R., 2017. Can social media be a tool for reducing consumers' food waste? A behaviour change experiment by a UK retailer. *Resources, Conservation and Recycling*, 117, 195-203. <https://doi.org/10.1016/j.resconrec.2016.10.016>
- Yuan, J.J., Yi, S., Williams, H.A. and Park, O.H., 2019. US consumers' perceptions of imperfect "ugly" produce. *British Food Journal*. <https://doi.org/10.1108/BFJ-03-2019-0206>
- Zheng, Q., Ieromonachou, P., Fan, T. and Zhou, L., 2017. Supply chain contracting coordination for fresh products with fresh-keeping effort. *Industrial Management & Data Systems*. <https://doi.org/10.1108/IMDS-04-2016-0139>
- Zhu, L., 2017. Economic analysis of a traceability system for a two-level perishable food supply chain. *Sustainability*, 9(5), 682. <https://doi.org/10.3390/su9050682>

Journal Pre-proof

Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Journal Pre-proof

Highlights

- Food waste in the supply chain is rarely examined from a retailer perspective
- Food retailers occupy a unique position to drive other members across the supply chain to reduce food waste
- There 44 recognisable factors that can influence food waste, grouped into 12 categories.

Journal Pre-proof