

CONSUMER AWARENESS OF FOOD WASTE REDUCTION - A SYSTEMATIC LITERATURE REVIEW FOLLOWING THE PRISMA STATEMENT

Sasho Nefovski

*PhD student at Ss. Cyril and Methodius University in Skopje,
Faculty of Economics – Skopje
nefovski@gmail.com*

Tatjana Petkovska Mirchevska

*Professor at Ss. Cyril and Methodius University in Skopje,
Institute of Economics – Skopje
tatjana@ek-inst.ukim.edu.mk*

Ezeni Brzovska

*Professor at Ss. Cyril and Methodius University in Skopje,
Faculty of Economics – Skopje
Ezeni.Brzovska@eccf.ukim.edu.mk*

ABSTRACT

This paper examines the role of social marketing in reducing food waste, focusing on consumer behaviour and awareness of its harmful effects. A systematic literature review (SLR) evaluates studies analysing marketing campaigns' relationship with food waste reduction. Increasing awareness and changing behaviour through marketing campaigns can significantly reduce food waste. This paper analyses relevant literature to present key findings and recommendations for effectively targeting consumers with communication strategies to reduce food waste. In addition, it explores recommendations for implementing point-of-sale activities and direct communication with consumers to promote sustainable food systems.

Keywords: *Social marketing, Consumer behaviour, Food waste, Communication strategies.*

JEL classification: *M30, M31, Q56.*

1. INTRODUCTION

Food waste leads to significant economic losses, and its reduction can positively impact overall production, GDP, and employment (Campoy-Muñoz *et al.*, 2017). Food waste poses a significant challenge to sustainability, as it squanders resources like energy and water, accelerates climate change, and exacerbates global inequality (Närvänen *et al.*, 2020).

Previous studies indicate that excess food and consumer behaviour are the primary causes of food waste in developed countries (Hodges *et al.*, 2011; Janssens *et al.*, 2019). Therefore, the key starting point for responsible consumption is awareness—both in behaviour and attitude—of its impacts (Paužuolienė *et al.*, 2022). Behavioral change is essential to reduce household food waste and move toward a more sustainable future (Barker *et al.*, 2021).

Marketing accelerates change, and its influence on economies and societies worldwide is undeniable (Webster and Lusch, 2013; Sutinen and Närvänen, 2022). Previous research suggests that marketing contributes to reducing food waste at the consumer level through strategies such as labelling use-by dates, packaging and design elements, pricing strategies, and communication that highlights the harmful effects of food waste (Aschemann-Witzel *et al.*, 2016). In particular, social marketing represents a key subcategory that achieves these effects

for social dynamics issues. It aims to develop and integrate marketing concepts with various approaches to influence behaviours that benefit individuals and communities for significant social good (iSMA, 2013). As a tool of social marketing, awareness campaigns can help consumers grasp the importance of environmental issues, including food waste, and its negative impact on the economy and society (Attiq *et al.*, 2021).

Through a systematic literature review (SLR), this paper addresses key questions linking marketing campaigns to encouraging consumers to reduce food waste.

The goal of this paper is to explore the role of social marketing in reducing food waste by examining consumer behaviour and awareness through a systematic literature review (SLR). It evaluates the effectiveness of marketing campaigns in promoting behavioural changes to reduce food waste and provides key recommendations for enhancing communication strategies. The paper contributes to the understanding of how targeted marketing interventions can raise awareness, influence consumer behaviour, and promote sustainable food systems while identifying gaps for future research on long-term campaign impacts.

2. METHODS

To achieve the paper's aim, the SLR method was employed. This approach facilitates a comprehensive and clear presentation of existing literature in a specific area (Tranfield *et al.*, 2003) and aids in providing information and synthesizing knowledge on the research topic, while also identifying existing gaps in the literature and opportunities for future research (Bhattacharya *et al.*, 2021). The presentation of data from this analysis adheres to the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Page *et al.*, 2021). Originally developed for health research, the method is also utilized in other fields, including marketing studies (Huurne *et al.*, 2017; Lim *et al.*, 2021), research on food waste management (Kasavan *et al.*, 2022; Rolker *et al.*, 2022; Srivastava *et al.*, 2023) and the food waste reduction process (Simões *et al.*, 2022; Hartmann *et al.*, 2021; Brennan *et al.*, 2021).

2.1. Defining the research problem and outlining the procedure

This paper aims to highlight new possibilities in social marketing that drive practical changes (Sutinen, 2022). To define the research problem, a literature review was conducted, which helped refine the objectives and select keywords for a search list (Badger *et al.*, 2020). The paper seeks to address the following research questions:

- 1.** How current is the topic of marketing as a strategy for addressing food waste?
- 2.** What is the most commonly used terminology in relation to marketing interventions for reducing food waste, and how is it categorized?
- 3.** Does marketing effectively change consumer behaviour to reduce food waste?

The research procedure in this paper, following the principles outlined by Gossen *et al.* (2019) is divided into three basic phases: review planning, review implementation, and reporting (dissemination).

In the planning phase, the focus of the literature review is determined by defining key themes. The process continues with the use of software to identify published publications based on keywords. Following the detailed processing and analysis of the data approaches for defining and implementing the concept for presentation and dissemination are developed.

During the review, criteria for the selection and rejection of published papers are established, as detailed in Table 1.

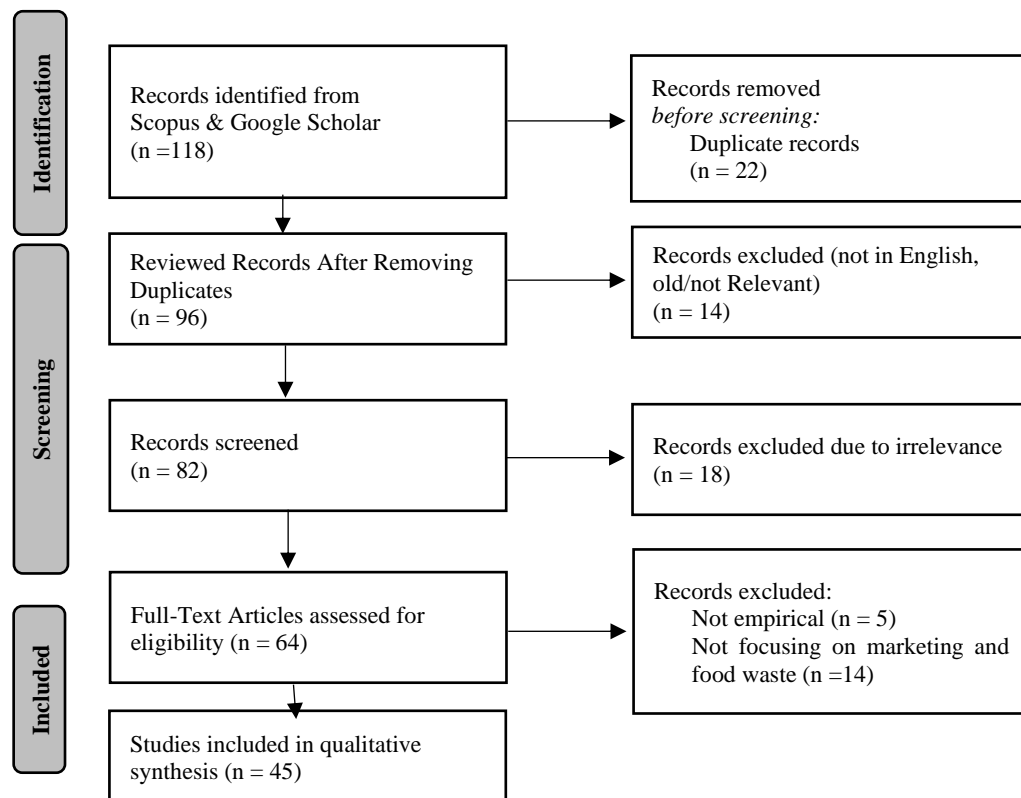
Table 1: Database Search Criteria

Criteria	Inclusion of Sample	Exclusion of Sample
Search Scope	SCOPUS & Google Scholar	Other databases
Source	Peer-reviewed journal articles, book chapters, conference papers, and relevant online publications	Any other source, e.g., dissertations
Type of Research	Empirical and conceptual papers	No exclusion
Time Period	Publications from 2007 to June 2024	Publications before 2008
Search Parameters	Search terms appear in the title, abstract, or keywords provided by the author	Search terms do not appear in the title, abstract, or keywords provided by the author
Language	English	Any other language

(Source: Adapted according to Gossen et al., 2019)

Key features associated with the systematic review are addressed, including the frequency of publication, place of publication, and key terms. The key findings and conclusions are then presented. In conducting the systematic review, the preferred reporting guidelines for systematic reviews and meta-analyses, namely the PRISMA method (Moher et al., 2009), are utilized. Figure 1 illustrates the PRISMA protocol for selecting literature included in this paper's analysis.

Figure 1: Chart overview of studies included in the systematic review based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) principles



(Source: Adapted according to Moher et al., 2009)

To identify existing literature in the field, the Harzing Publish or Perish software was employed. We selected all published papers from the SCOPUS and Google Scholar databases to compile a comprehensive database of publications. The search was conducted in two phases:

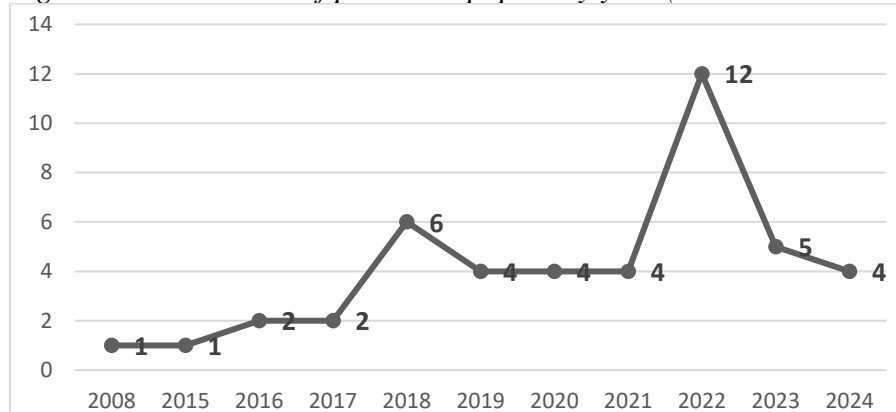
- Phase One: Papers containing the term “food waste reduction campaigns” were identified.

- Phase Two: Papers containing the term “food waste marketing” were searched.

The analysis included 118 publications from the period 2008-2024 (see Figure 1). Following a detailed review of the literature, 45 relevant papers were selected. During the filtering process, we excluded non-English publications, older papers, those lacking empirical results, and papers not directly related to the topic. Data Mining software, Orange, which offers a visual programming framework with an emphasis on interactive and creative combinations of visual components was utilized for processing and visual presentation of the data (Demšar *et al.*, 2004).

The results indicate a growing interest in studies related to marketing activities aimed at reducing food waste. Since 2008, the number of papers published has increased generally, with a notable surge in the last three years, particularly in 2022. Further research on this topic is anticipated to be published in 2024.

Figure 1: Distribution of published papers by year (2008 - June 2024)



(Source: Authors' analysis)

The analysis presented in Figure 1 includes works relevant to the processing of this SLR. The preliminary results highlight the timeliness of addressing food waste and employing marketing approaches as methods to improve the situation, thereby addressing **Research Question 1**. Existing research underscores the importance of establishing public commitments and goals (Schmidt, 2016) as well as conducting information campaigns to enhance awareness of food-related issues (Soma and Maclaren, 2020).

Table 2 presents a list of papers included in the analysis. In addition to scientific journals, the table features research from conferences, university textbooks, and relevant online publications.

Table 2: Publication sources of analysed papers

Scientific journals	Number
Journal of Cleaner Production	4
Journal of Food Products Marketing	3
Resources, Conservation and Recycling	3
Social Marketing Quarterly	3
Journal of Social Marketing	2
Waste Management	2
Sustainability (Switzerland)	2
African Journal of Hospitality, Tourism and Leisure	1
Australasian Journal of Environmental Management	1
Australasian Marketing Journal	1
Environmental Science and Pollution Research	1
European Journal of Marketing	1

Food Quality and Preference	1
Indian Journal of Marketing	1
Journal of Business Research	1
Journal of Extension	1
Journal of International Food and Agribusiness Marketing	1
Journal of Macromarketing	1
Journal of Marketing Management	1
Journal of Quality Assurance in Hospitality and Tourism	1
Journal of Sustainable Marketing	1
Kybernetes	1
Resources, Conservation & Recycling Advances	1
Preventive Medicine	1
Technological Forecasting and Social Change	1
World Food Policy	1
University textbooks	
Social marketing in action, text book	1
Conference Papers	
Sustainable, Resilient and Fair Food Systems in the EU and Globally International Scientific Symposium, Bratislava	1
International Conference On Multidisciplinary Studies (ICOMSI 2022), 2023	1
IOP Conference Series: Earth and Environmental Science	1
AIP Conference Proceedings	1
ceeol.com – Conference	1
Online publications	
PR Week	1

(Source: Authors' analysis)

The analysis conducted using Orange: Data Mining generated a cloud of frequently used words in the published literature (see Figure 2). This cloud was created using titles, abstracts, and keywords from all papers included in this SLR.

Figure 2: A Cloud of commonly used words in the SLR



(Source: Orange - Data Mining - authors' analysis)

To address the **second research question**, the data on term frequency are presented. The term most frequently used in the literature is “food” appearing 404 times. It is closely followed by

the term “waste”. Other commonly used terms include “consumers”, “social”, “campaign”, “marketing” and “behaviour”.

In that context, Table 3 illustrates the frequency of the most commonly used words, such as “food” which is frequently connected with the terms “waste” and “consumer”.

*Table 3: Frequency of most used words in papers subject to this SLR**

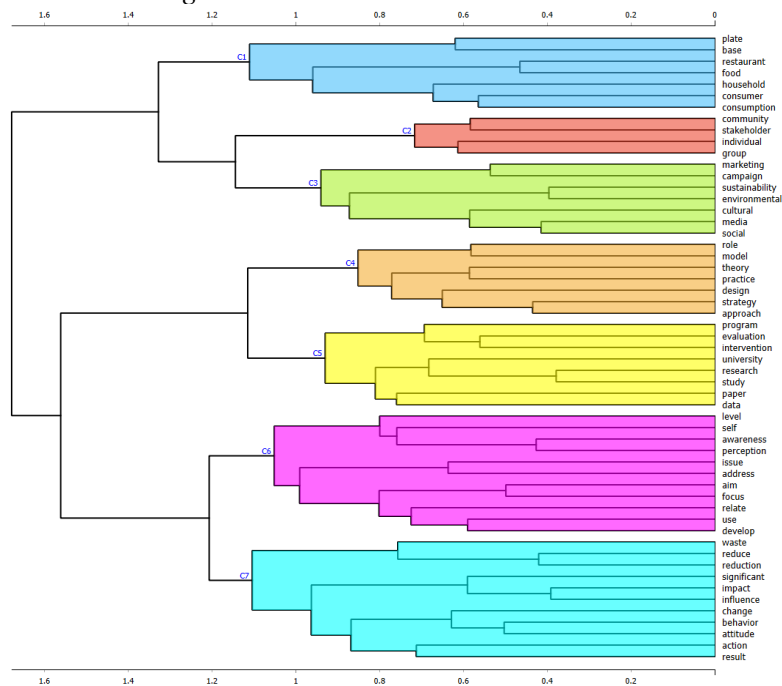
Phrase	Freq.	Phrase	Freq.	Phrase	Freq.
food	404	Approach	26	attitude	18
waste	346	Sustainability	24	Self	18
consumer	139	Base	23	plate	17
social	117	Strategy	22	theory	17
reduce/reduction	116	Intervention	21	design	17
campaign	112	Significant	21	perception	17
marketing	99	Focus	21	data	16
behavior	73	Group	21	aim	16
study	67	Consumption	20	result	16
change	42	Develop	20	individual	16
Use	40	Issue	19	program	16
awareness	33	Stakeholder	19	action	15
research	33	Model	19	university	15
media	33	Role	18	address	15
impact	31	Practice	18	cultural	15
household	28	Evaluation	18	restaurant	15
environmental	27	Community	18	influence	15

*Words irrelevant to the topic, such as conjunctions and adverbs, are excluded from the analysis.

(Source: Authors' analysis)

By grouping the terms, a logical distribution of clusters is observed. Cluster 1 (C1) includes words related to food waste in the catering sector. Cluster 3 (C3) centers on marketing and campaigns addressing sustainability and environmental issues. The final cluster focuses on terms related to behavioural change intentions that aim to reduce food waste (see Figure 3).

Figure 3: Hierarchical Term Clusters



(Source: Authors' analysis)

3. DISCUSSION

As the paper primarily focuses on the awareness and impact of the marketing campaigns on changes in consumer behaviour, it is expected to employ primary research methods and techniques (e.g. Susilo *et al.*, 2022; Aschemann-Witzel *et al.*, 2016; Muposhi and Musavengane, 2023) as well as other research mechanisms (e.g. Hodgkins *et al.*, 2019; Rybanská *et al.*, 2022). Surveys are widely used in academic marketing research because certain topics are best studied by directly asking consumers questions (Hulland *et al.*, 2018). While statistical data are particularly useful for identifying the magnitude of a specific problem, qualitative data provide greater insight into root causes and processes (Granot *et al.*, 2012). Case studies (e.g. Calvo-Porrá *et al.*, 2017), focus group research (e.g. Kansal *et al.*, 2022), observation (e.g. Pinto *et al.*, 2018) and other methods have also been employed in the papers. All the papers emphasize the pressing issue of excessive food waste. The growing problem of food waste from consumers, which significantly impacts both the economy and the environment, is highlighted (Jenkins *et al.*, 2022; Zamri *et al.*, 2020). In addition to its negative environmental effects, food waste also adversely affects food businesses by increasing costs (Chen and Jai, 2018).

Final consumers are the focus of numerous studies, and the SLR indicates that they are generally considered key contributors to food waste (Aschemann-Witzel, 2018). Per capita, consumers in Europe and North America waste approximately 95-115 kg of food per year (Silchenko *et al.*, 2019). The research analysed in Wansink's (2018) study shows that most consumers are not highly motivated to change their food waste behaviours, suggesting that relying solely on education and personal willpower may not be effective in the short or long term. Understanding the seriousness and causes of food waste among consumers is crucial for educators addressing this complex issue (McCoy, 2019).

One study included in the SLR indicates that concern for food waste is linked to a reduced tendency to waste food and that consumers who prefer organic products exhibit significantly different attitudes compared to those with a more conventional approach (McCarthy and Liu, 2017). Similarly, Chen and Jai (2018) found that consumers with a higher level of socially responsible consumption are more proactive in preventing food waste when dining out. In fact, adopting a lifestyle with environmental awareness is identified as the most effective factor in shaping consumer behaviour toward food waste (Szakos *et al.*, 2021).

Another study explores the correlation between consumers' religious affiliation and their relationship with food waste. It presents findings indicating that negative attitudes toward food waste are positively associated with traits such as conscientiousness, frugality, and religiosity (Kutlu, 2022). When designing campaigns to reduce food waste among consumers, it is important to consider factors such as their attitudes and beliefs about others' opinions, their motivation to conform, their confidence in their ability to control their behaviour, and the resources available to them (Wastutiningsih and Aulia, 2023).

Price policies, which offer significant to moderate reductions, positively influence consumers' pro-environmental attitudes. However, research indicates that among consumers with higher monthly incomes, reduced prices and other economic incentives are less likely to impact decisions to reduce food waste (Aschemann-Witzel *et al.*, 2016).

According to Szakos *et al.* (2021), behavioural components should be considered when designing prevention campaigns. Another study highlights the importance of understanding consumer perceptions to create effective educational campaigns addressing food waste issues (Hao *et al.*, 2022). Communication campaigns are more effective when tailored to specific consumer segments, with messages incorporating culturally relevant emotional and moral appeals (Kansal *et al.*, 2022). Kutlu (2022) points out that segmentation is often overlooked as a marketing tool in food waste campaigns and seeks to identify potential market segments for social marketing efforts. Research by Kansal *et al.* (2022), based on data from 90 participants

in nine focus groups, finds that the cultural and religious backgrounds of specific Asian communities significantly influence their food behaviour. Additionally, research across three different consumer segments suggests that policymakers and companies should target marketing messages to reduce food waste, tailored to the characteristics (similarities and differences) of each target group (Aschemann-Witzel *et al.*, 2016).

Tailoring messages and selecting appropriate media to communicate with target groups willing to change their food waste behaviour is crucial for campaign effectiveness (Pearson and Perera, 2018). Research by Aschemann-Witzel (2018) reveals that female respondents are more engaged with various food-related issues, and there is a positive relationship between commitment to food-related matters and the level of education. Previous studies highlight the need to address food waste behaviour among younger demographics, emphasizing the importance of guiding young people on proper food handling and measures to reduce waste (Hodgkins *et al.*, 2019). Childhood education and awareness-raising should be central activities, as they can instil habits before routines leading to excessive food waste become deeply entrenched in individual behaviour patterns (Szakos *et al.*, 2021).

The **third research question** addresses whether marketing leads to changes in consumer behaviour aimed at reducing food waste. Alongside increasing awareness of the food waste problem, various interventions are emerging to address it. One of the most commonly used interventions is marketing awareness campaigns, which provide information and advice to motivate households to reduce their food waste (Soma *et al.*, 2021).

Research by Sawasdee *et al.* (2020) demonstrates that green marketing significantly reduces food waste generation. Social marketing plays a crucial role in initiating and encouraging socio-cultural changes (Sutinen, 2022). A previous systematic literature review concluded that marketing experts have a unique opportunity to reduce food waste by implementing small changes in product packaging, promotion, pricing, and distribution systems. This perspective is supported by research from Lee *et al.* (2024), which found that a marketing mix co-designed by stakeholders, including restaurants and consumers, effectively reduced food waste by nearly half during a pilot project. Participants in a study conducted in Australia reported that increased promotion, greater exposure to communication messages, and more frequent advertising would enhance their perception of the need to reduce food waste (Hodgkins *et al.*, 2019). Additionally, most focus group participants indicated feeling more motivated to reduce food waste after being exposed to a food waste awareness campaign (Soma *et al.*, 2021).

Furthermore, another study highlights that the effectiveness of a campaign is significantly enhanced by the availability of additional materials to the public (Shu *et al.*, 2023). By leveraging digital technologies and marketing expertise, retailers can motivate suppliers to reduce waste and encourage consumers to adopt sustainable purchasing and consumption behaviours (Zhang *et al.*, 2022).

4. CONCLUSION

Through a systematic literature review, this paper analyses the effects of marketing campaigns on raising awareness of food waste reduction. There is a noticeable growing trend in research in this area, driven primarily by the scientific community's recognition of food waste as a serious economic, environmental, and social problem that demands change.

The papers analysed in this study frequently include terms such as “food”, “waste”, “consumer”, “sustainability”, “reduction”, “campaign”, “marketing”, “behaviour” and “change”. The results indicate that marketing campaigns can effectively influence consumer behaviour. Previous research underscores the importance of targeting consumers based on segmentation according to their characteristics.

This paper also identifies certain challenges and limitations, such as insufficient data on the long-term effects of campaign implementation and the lack of standardized methodologies in research, which complicates the comparison and synthesis of results.

Overall, the systematic literature review demonstrates that social marketing, through targeted campaigns, has the potential to significantly reduce food waste by altering consumer behaviour. However, to achieve sustainable results, it is essential to implement integrated and long-term strategies that consider the cultural and social aspects of consumers.

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