

TITLE:

**AN EXPLORATORY STUDY OF SHOPRITE
AND CHECKERS AS A MEANINGFUL BRAND
IN THE CONTEXT OF FOOD WASTE
MANAGEMENT**

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ABSTRACT

Background: Food waste and loss continue to be a problem globally. This is despite many people going hungry in the world, especially in sub-Saharan Africa. A lot of food is wasted during the early stages of production in low-middle income countries such as South Africa. But recent wastages in post-harvest to consumer supply chain stages put retailers such as Shoprite and Checkers at the centre of food waste management research.

Objective: Thus, the main objective of this study was to describe how Shoprite and Checkers managed or failed to manage the sourcing and processing of raw materials to minimize food loss and food waste.

Method: To achieve this objective, this study applied a secondary qualitative research as a design. Content analysis of text data in the form of existing online media materials on the subject of Shoprite and Checkers and food waste was applied. Three online articles were sourced and analysed using a thematic analysis technique as a method of data analysis.

Findings: From this analysis it was found that food waste and loss happen at the agricultural or production levels in Shoprite and Checkers' supply chain. This was despite efforts made by the group to reduce food waste, and despite the fact that the retailer does not directly control the independent large-scale farmers responsible for food production. It was also found that food waste leads to waste of embedded resources such as water, land, capital and labour. At the same time, it was found Shoprite and Checkers makes efficient effort towards preventing and reducing food waste/loss. It does this by using predictive analytical tools such as artificial intelligence and machine learning to mitigate against food waste (South African Good News, 2022). The retailer also demonstrated to be socially and environmentally conscious, thus fulfilling its endeavours towards being a brand with purpose.

Implications: To provide information that may guide in the development of protocol and guidelines to improve food waste management efforts. To inspire formulation of wider public policy to food waste management, and change consumer behaviour regarding food in general.

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1. INTRODUCTION

Food waste and food loss are a global problem. The United Nations Environment Programme (2021) reported food waste to a total of 931 million tonnes each year. This is despite 800 million people going hungry in the world, especially in sub-Saharan Africa. Much like in the world, a lot of food in South Africa is wasted. Much of it is traditionally wasted during the early stages of production, with many losses and wastages also occurring at retail and consumer levels of the supply chain (DEFF & CSIR, 2021; Oelofse, 2014). Implications for food waste and loss in a low-middle income country like South Africa is detrimental to government efforts against the triple challenges of poverty, inequality and high rates of unemployment (Reddy, 2020).

For this reason, inquiry into this area is necessary.

Despite much research already conducted on food wastage, there still exists a need to study the topic further, in particular within the South African context, which is characterized by rampant poverty and inequality (Reddy, 2020). Further inquiry will potentially assist to devise strategies that can contribute to mitigating this challenge, and thereby make a positive contribution towards food security and minimising hunger in the country.

Thus, the purpose of this study is to describe the extent to which Shoprite and Checkers manages or fails to manage the food waste issue, and whether it ascribes to being a meaningful brand in how it manages the problem of food waste or food loss in South Africa. As noted in the IIE (2022), the primary objective of the study is “to gain a thorough understanding of the extent to which Shoprite and Checkers can be described as a meaningful brand or a brand with purpose in the context of food waste management.” Secondly, by this study the researcher aims “to gain an in-depth understanding of the way

in which Shoprite and Checkers is, or not, managing the sourcing and processing of raw materials in order to minimise food loss and waste.

1.1. Rationale

While millions face hunger globally, tonnes of food is also lost every year (WHO, 2020). With hunger as one of the most important problems to eradicate in particular in a highly unequal society such as in South Africa, it is expected that research in this area may inform policy and new strategies that can unleash efforts to reduce food insecurity and hunger in the country.

Research on food waste and losses has been conducted both locally and internationally. The studies in the field have ranged from baseline cross-sectional studies to extensive qualitative ones, covering the entire supply chain of the food waste management. However, despite these extensive studies in the field, a lot of the waste still gets to happen at the early stages of production in South Africa (DEFF & CSIR, 2021; Oelofse, 2014). What is concerning, however, is that for South Africa, food is today also getting lost at the retail and consumer levels of the supply chain. It is surprising to see rises in food waste at the retail sectors and consumer levels, especially when research points to the fact that low-income households tend to have the highest rates of food waste than both middle-income and high-income households (Bormann, 2017; Bega, 2020). Thus, South Africa's slow transition from a country that loses food at early stages of production to the one that now loses it at the retail and consumer levels puts the retail sector, especially conglomerate supermarket chains such as Shoprite and Checkers, on the spotlight. The question arises as to how much such brands contribute to food waste? How much does a retail supermarket chain such as Shoprite and Checkers contribute in food waste, and what efforts does it put in place to reverse the problem?

Thus, the aim of this study is to describe the extent to which Shoprite and Checkers effectively manages food waste and loss in South Africa. To achieve

this objective, the study is designed as a case study focussing on one major role player in the retail sector. The case study will apply descriptive qualitative research methods where secondary data collection in the form of content analysis of media outlets covering the topic of food waste will be conducted. The aim is to uncover the developments in the food waste management area, especially by Shoprite and Checkers over the years. Convenience sampling of multiple media materials will be undertaken to understand the perspective and behaviour of Shoprite and Checkers on its commitment to food waste management. Putting a spotlight on a specific retailer is unprecedented in South African consumer research; not many studies have covered content relating to food waste management within the objectives specific to case studies on retail chains, let alone case studies on a particular role of a retail brand such as Shoprite and Checkers. A study by Dlomo (2021) on “Understanding food waste management practices in the grocery retail sector in Durban, KwaZulu-Natal” was generalized to a retail sector with little focus on what specific retailers were doing to manage the situation.

With this case study, the researcher aims to contribute to, and potentially inform, the formation of the first food waste management policy in South Africa. The research will help broker the relationship between retailers and consumers; investigating consumer perspectives and behaviour about food will lead to educating the public about threats of food insecurity and environmental threats related to wasting food.

1.2. Problem Statement

It is unavoidable that a retailer like Shoprite and Checkers can become immune from contributing to food waste. However, with its healthy brand endeavours, the retailer has self-reported to be making efforts towards food waste management; as a responsible brand, it has reported to have ensured it communicates and works with the wider public in order to tackle food waste.

For example, Shoprite Group Sustainability manager, Sanjeev Raghurir, reported Shoprite to be proactive in preventing food wastage before it had a chance to start (Petersen, 2022). Although they may perceive and promote themselves as doing more to mitigate against food waste and helping change consumer behaviour towards food waste management, public and media perception always differ regarding their self-judgment.

Part of their efforts towards reducing food waste also include their involvement in the global effort towards food waste management and the fight against climate change. Following on the footsteps of the South African government's promise to halve food waste by 2030, Shoprite and Checkers has also joined other retailers as part of the United Nations Sustainable Development Goals aiming to halve the global food waste at retail and consumer levels by 2030 (DEFF, 2020; Parfitt, & Jenkin, 2020). However, it is not clear how this goal might be achieved given that the country does not have proper regulation of the industry in place. Unlike in other countries where the development of legislation has taken place to enable effective management of food loss and wastage, South Africa has only regulated environmental waste management through the Waste Act of 2008; it has only introduced measures to curb food wastage at processing, packaging and retail levels through compulsory date stamps on food governed by the Foodstuffs, Cosmetics & Disinfectants Act (South African Government, 2022; Matlala, 2020).

The food retail sector— made up by multiple giant supermarket brands such as Shoprite and Checkers, Pick 'n Pay, Woolworths and Spar, among others— is often pressured to reduce wastage during processing and packaging phases by “increasing recycling rates and educating their customers to be more environmentally conscious (Parker, Sikobi, Jones & Mason, 2020). Shoprite and Checkers has over the years attempted to mitigate against food waste and loss by forging partnerships with food surplus brands and non-profit

organizations (NPOs). However, as much as Shoprite and Checkers makes efforts at the retail and consumer phases of the supply chain, the brand still faces three challenges that threatens its efforts towards an effective food waste management system. (Smith & Smit, 2010).

The first problem is that retail stores like Shoprite and Checkers are perceived to be lacking control over food wastage at the primary levels of food production because large-scale farmers are usually independent from supermarket chains (Louw, Jordaan, Ndanga & Kirsten, 2008). This leaves retailers with the problem of having to share the burden of food wastage at critical stages of harvest and post-harvest up through to packaging and processing with the farmers without actually effecting any control (Louw et al., 2017).

Secondly, failures at post-harvesting in turn cause retailers to fail in dealing with losing food at distribution and wholesale. Tonnes of “edible products expire before being purchased” (Lipinski et al., 2013:5). According to Bega (2021) “food waste in the consumption stages has soared from 5% in 2013 to 18% in 2021”. Food loss and wastage at the retail end of the supply chain may also mean that much of the food that was packaged and ready to be consumed by the public never gets to reach them.

Thirdly, the retail chain struggle to control consumer behaviour towards food waste at the consumer end of the supply chain. Shoprite and Checkers sells food products to the public at wholesale and retail stores but does not seem to have measures and plans in place to intervene in household food waste beyond the business transaction between themselves and their clients (Smith & Smit, 2010). Research on household food waste shows that the food that gets to reach consumers is also wasted irrespective of income level or economic status of the households. In fact, research in the City of Rustenburg (von Bormann, 2017:8) “found the weight of food waste as a percentage of

the total weight of domestic waste” to be highest in low-income areas than high-income areas. Oelofse (2014) also explains that the bulk of the wastage at the consumption stages occurs through export of food to European countries where “food is treated as a disposable commodity”.

Given this, this study aims to focus on food waste problems in the retail sector. The aim was to gain extensive understanding of how one of the leading retail brands in the country (e.g. Shoprite and Checkers) manages food waste and food loss in South Africa. This study is a case study which will be undertaken using qualitative methods for the purposes of understanding, in an in-depth way, how Shoprite and Checkers manages or fails to manage the sourcing and processing of raw materials (such as agricultural products, ingredients, processing aids and packaging) in order to minimize food loss and food waste. Through this case study, the research also explored the extent to which Shoprite and Checkers, selling food products to the public (consumers) at wholesale and retail stores, contributed to food waste. Since it is well known that South Africa often mirror the retail and consumer behaviours of the developed world, which in effect make it a country that treats food as a disposable commodity (CSIR, 2021; Oelofse, 2014), the study also investigated consumer perspectives about how they use and dispose of the brand.

2. OBJECTIVES OF THE STUDY

This section outlines the goals and objectives of the study, as well as research questions that would guide the research.

2.1. Aims and Objectives

With 10 billion tonnes of food lost every year in South Africa, and 800 million people in the world suffering from hunger, the role of the retail sector as the main distributor and driver between the food producers and consumers had

become very important (World Biogas Association, 2018; DEFF & CSIR, 2021). Food insecurity, environmental bio-hazards emanating from bad management of food waste by retailers, and irresponsible wastages by consumers, contribute to hunger and global warming. From this background, the aim of this case study was to gain a deeper understanding of the extent to which Shoprite and Checkers effectively manages food waste and loss in South Africa. It described how the retailer managed or failed to manage the sourcing and processing of raw materials to minimize food loss and food waste.

Thus, it was important to conduct a study within the retail sector, especially a case study with a specific supermarket store to get an in-depth understanding of the way in which they manage food waste and how they help consumers become responsible role players in managing food waste.

2.2. Research questions

The research questions can be described as a “beacon” that guide the researcher during the research inquiry as they strive find the answers to the research problem. To is to guide the research process towards solving the research problem. A good research question will have the following attributes: concise, clear, operationalizable, open-ended, timely, theoretical and self-explanatory, Maree (2020). Therefore, this study asks the following research questions:

- a) How do online media articles perceive outlets (like Shoprite/checkers) that sell food to the public at wholesale/retail establishments to be contributing to food waste?*
- b) What do online media reports say regarding Shoprite/Checkers’ methods for reducing food loss and waste in SA?*
- c) How do online media articles think Shoprite/Checkers fare in terms of the healthy brand criteria when it comes their practices with regards to food waste/loss*

d) What message about food loss/waste does online media believe Shoprite/Checkers convey to its customers?

3. LITERATURE REVIEW

The history of food waste management dates to as far back as the 1800s in America (Utah State University, 2022). The history of food waste coincides with industrialization which introduced rapid, mass production of food to populations who earned enough of a living to afford food (Utah State University, 2022). But this historical loss of food was more of a problem at the consumer end of the supply chain. More recently, food waste is closely linked to globalisation. In an ever more networked world, supply chains get longer, and everything is available everywhere. Although the oversupply of food to an affording middle class already leads to wastage, much of the food also gets lost in every step of the supply chain.

Today a distinction is made when defining food waste, especially from food loss. Food waste is regarded as food that is suitable for human consumption but was found disposed of by consumers due to damage (Mustamina, Rombeb, Hadic and Vesakha 2020). Food loss is on the other hand, food that is lost before leaving the farm (Teoh et al., 2022). As a result of food waste and losses, many developed and developing countries, experience massive losses. Mustamina et al. (2020), state that food waste can occur due to either intentional or unintentional actions. For example, "foods that spill or rot before reaching the final product or retail stage are called food losses." These food losses can be caused by various things such as problems at harvest, storage, packaging, transportation, market mechanisms, and institutional and legal frameworks (Mustamina et al., 2020). In addition, Reddy (2020) explains that the largest proportion of food losses take place during the agricultural and production stage, processing, packaging and distribution and retail. These account for a total of 95% of losses that occurs in the supply chain process.

Consumers account for a mere 5% wastage in the total supply chain process. This was contrary to previous studies that highlighted food wastage or losses mostly at the consumer level. More recent research has found that retailers play a critical role as brokers between producers and consumers (Midgely, 2014; Hermsdorf et al., 2017). Retailers entice consumers to buy more food than is needed through promotions and this food can subsequently result in wastage (Peatti, 1998 in Hermsdorf et al., 2017).

Moreover, studies have found that food waste occurs due to the quality standards set by retailers. In other words, food that does not meet the required standard, in the early stages of the supply chain processes, is thus discarded or disposed. Hermsdorf, Rombach and Bitsch (2017) argue that food waste raises moral and economic concerns. Supporting this notion, Martin-Rios. et al. (2020), further argue that wasting food also has a negative impact on the environment as it means that the scarce resources required for food production such as land, water, and energy are also wasted. According to Mustamina, et al. (2020), food waste does not only impact the economic sector of the country but also affects the environmental and social sectors too. Graham-Lowe et al. (2014) caution that food waste worsens the problem of escalating food prices, which in turn causes food to be unattainable for the poor. Attesting to this, is a finding that 820 million people worldwide were estimated to be undernourished in 2018 (Martin-Rios Hofmann & Mackenzie, 2021). Thus, food waste results in a missed opportunity to feed the millions of people who go hungry on the daily basis.

Given this scenario, there have been global attempt to tackle the problem of food waste and loss. In 2015, the United Nations (UN) set a Sustainable Development Goal (SDG) of halving worldwide food waste by 2030. This goal signified the renewed international interest to reduce food losses and food waste between the “farm and fork in the global food system,” (Sheahan &

Barrett, 2017). This movement against food waste was also joined by many giant supermarkets in their effort to play their social and environmental part in fighting against world hunger and food insecurity and climate change, two pandemics caused by the amount of food left to waste.

In summary, reducing food waste is important for the following reasons: to improve food security; improve food safety; reduce wasted resources, and to increase profits along the food supply chain (Sheahan & Barrett, 2017).

Mitigating food waste/ losses

For South Africa, efforts towards food waste management have in history found expression through pro-poor and poverty reduction programmes such as the Reconstruction Development Programme (RDP), which was generally designed to tackle poverty and inequality. Recently, government promised to reduce food waste by 50% in 2030. The laws which will operate within the context of waste management concentrate on the disposal of food using technological and other inventive ways companies may employ to dispose of food waste (Averda, 2022).

Some of these food waste reduction and prevention methods include the use of technology such as artificial intelligence and machine learning tools to predict outcomes of sales, product durability and the like (South Africa Good News, 2014). Some retailers also use a network of partnerships and communities to better communicate their plans about food waste prevention. Most include charities that involve donating food items that are no longer marketable to consumers. Human (2019) has noted that most retailers in South Africa actively donate surplus food to charity organisations. Consequently, there are non-governmental organisations have been formed whose sole purpose is to redistribute this surplus food. Other organisations, such as Foodeez buy non-perishable food that has a short lifespan or food items that have been damaged, and then sell these to consumers for a much

cheaper price. According to BusinessTech (2022), some of the donations rake in to the value over millions of rands, and help beneficiary charity organizations to redistribute the food to the poorest communities.

Some retailers train employees on food donations (BusinessTech, 2022). Some have interacted with their customers on matters involving the product they intent to buy and consume, such as understanding expiry dates on products. Previous studies (e.g. Thompson, Barnes & Revoredo-Giha, 2020) have found that the lack of or poor understanding of date labelling by consumers was also a contributor to food waste. For example, consumers who understood the meaning of date labels were likely to consume food products after the expiry date. In the United Kingdom (UK), policymakers have proposed that the food industry needs to consider streamlining date-label application, and where possible, they needed to encourage the use of best-before dates. However, for this to be successful, consumers must also get to understand the difference between date types and be in a position to act on this information. Thompson, B. et al (2020:2) further state that “consumer communication that goes beyond improving expiry-date knowledge and addresses the multifaceted nature of related risk perceptions and conceptions of date-label trust will be required.” In addition, consumers would also need to be prepared to consume products after the best-before date.

Combined with the fact that South Africa is a water scarce country, the amount of food and water wastages at both the production and consumption levels of the supply chain puts a strain at the efforts made towards efficient management of fresh water in the country. To counter increases in food wastages throughout the world, and in South Africa in particular, world organisations and governments have initiated programmes and policies directed at better managing food waste. Managing and countering food waste works against negatives impacts on economy, especially against food

insecurity and water wastages (DEFF & CSIR, 2021). For example, to support sustainable development, the United Nations “set a target to halve the per capita global food waste at the retail and consumer levels, and reduce food losses along production and supply chains, including post-harvest losses, by 2030.”

Food waste and attitude of consumers in SA

Reddy (2020) describes the extent to which food waste occurs in South Africa. According to the World-Wide Fund for Nature report (Reddy, 2020), out of 31 million tonnes of food produced in South Africa each year, 10 million tonnes are wasted. Furthermore, nearly a 25% of the population in the country are going to bed hungry (Reddy, 2020). Human (2019) also believes that more often than not, surplus food in South Africa ends up as waste because farms and food companies do not do enough to “identify, remove or redirect it.” Farms typically have surplus food due to overproduction. Sometimes, surplus food results from over-ordering in the retail sector. Yet there is a trend in South Africa where food is wasted due to consumer behaviour.

South African households are likely to throw away greater quantities of unprepared or raw food as compared to prepared food and drinks. This trend was attributed to poor food storage facilities in households as well as behavioural practices of buying more than what is needed when food is being sold at low prices (Chakona & Shackleton, 2017). Looking at food waste and the behaviour of South African consumers, Ramukhwatho, du Plessis and Oelofse (2016) found that food wastage is similar to that of developed countries. Surveyed respondents in South Africa offered similar reasons for food wastage and these pertained to that the food had reached its sell-by-date and thus was deemed to have expired (Ramukhwatho et al., 2016).

Consumer behaviour in food waste management

As has been earlier indicated, “food waste is a complex and a global problem throughout supply chains and is contributed to by many actors, including farmers, food processors, retailers, food outlets and households,” Young et al. (2018:1). Different researchers have cautioned that food waste needs to be avoided in order to mitigate the environmental, social and economic impact. One of the ways that have been suggested to do this, is through influencing consumer behaviour. Petrescu-Meg, Petrescu and Robinson (2019) argue food waste is largely fuelled by the culture of consumerism that started in American society in the 1950s but took over the whole world in modern society, particularly in the West. The authors further argue that consumers often do not see their own ethical responsibility as regards food waste. The need to purchase more, discard and replace has become a norm in society.

Changing consumer behaviour is not a simple task. A combination of different methods and different stakeholders are needed to change consumer behaviour toward food waste (Petrescu-Meg et al., 2019). Some suggested methods of curbing this problem are as follows: improved food labelling that is easier to understand, managing consumer expectations in relation to the acceptability of food standards such as appearance or storage requirements, and improvement of consumer household food management behaviour. With regard food labelling, Thompson et al. (2020) argue that labelling food with a best-before- date could give consumers the confidence to consume food after the best-before-date and thus assist to reduce household food waste. The rationale behind this proposal is that the best-before-date is a measure of food quality “the date until which the food retains its specific properties”. It is also recommended that consumers should be encouraged to rather choose longer-lasting food such as frozen items (Petrescu-Meg et al., 2019).

In addition, Petrescu-Meg et al. (2019) found that consumers' food temperance behaviour was also informed by religious beliefs, in which, for example, Orthodox Christian believers, in particular, practised food fasting as part of adhering to the religion. Therefore, this fasting is an important exercise in practising food temperance which in turn has a positive impact on food waste management. This insight may be worth noting by marketers when crafting messages on food waste, as one's religious convictions may play a meaningful role in one's behaviour and habits.

Meaningful Brands and food waste management

According to Cook, Erwin, Carmody, and Enslin (2010), a healthy brand is one that considers and makes an effort to accommodate the well-being of all people, animals and the planet into its organisational design. It has been established that food waste and food losses have a negative impact on the environment and society at large and this practice does not conform to the expectations of a healthy brand that is environmentally and socially responsible. Furthermore, for a brand to be healthy, it must have purposeful meaning. The authors describe a brand's purposeful meaning as "a specific and clear purpose that often encompasses a value set" (Cook et al., 2010:13). It is the reason behind the brand's existence. A brand's purpose must be evident in all that it does. In other words, the brand needs to demonstrate that it fulfils its purpose throughout its value chain (Cook et al., 2010).

Thellefsen and Sorensen (2013) assert that brand values cannot be claimed but should be earned. In other words, companies should not only state their core values and beliefs but should also demonstrate them in how they conduct business. As regards food waste management, if brands claim to be environmentally conscious, for example, they would need to show action on how they are mitigating the problem of food waste in their supply-chain processes. Thus, the brand is the result of a process where certain brand

values become integrated into a product, an organization, a community, etc., and where these brand values no longer meaningfully can be distinguished from these. Looking at the food waste management value chain, it can be argued that the business practices of a brand may not be aligned with its value sets. The brand must have a distinctive and unique identity. Cook et al. (2010) highlight that the identity of a brand is what makes it different from the others, which is what constitutes the concept of a brand.

A healthy brand needs to be engaging an effective communicator and display consistent messaging, Cook et al. (2010). Furthermore, a healthy brand must demonstrate how it adds value to people's lives, does not harm society or the environment, and is able to give back more than it takes. Brands that are involved in the food waste value-chain, would fall short of these criteria, as it can be argued that they are guilty of harming the environment and society at large. For a healthy brand, purpose above profit is its driver for existence, Cook et al. (2010). It has been shown that companies in the food waste management value-chain, are likely to be driven by sales and profit above all else. For example, retailers need to drive sales through promotions and push consumers to buy more food than they need which ultimately results in food waste (Peatti, 1998 in Hermsdorf et al., 2017).

Use of social media to change consumer behaviour

Prior studies found that consumers are also very concerned about food waste. However, it is noted that although the intention is there to practice sustainable ways, this does not necessarily translate to behaviour change (White et al., 2009; Teoh et al., 2022). As suggested by White et al. (2009), one of the ways in which to help consumers to change their behaviour is through the use of social media.

It was observed that the advent of social media has brought about a great influence on consumer behaviour. For example, posting appetising meals on

social media platforms has gained popularity over time. As a consequence of this, more food could potentially end up being wasted. One of the possible reasons for the increasing household food waste is due to the millennials live to eat mentality (Teoh et al., 2022).

The suggestion made by research is that since social media makes information accessible and available to everyone, it becomes an important tool to use to influence consumer behaviour. When consumers are constantly exposed to messages promoting food waste prevention, they are more likely to develop a negative attitude toward food waste (Teoh et al., 2022).

Research by Young et al. (2018) indicated that messaging strategies to encourage behaviour change from consumers were effective. The results of this study showed that messages carried on a combination of communication channels including social media and repeated over a period of time had a significant impact on the levels of food waste reported by consumers, who recalled the message. Thus, the authors argue that a combination of channels to communicate food waste reduction messages serve as a constant reminder to consumers and are more effective than a once-off campaign. Given that social media carries the least cost compared to traditional communication mediums such as radio, television, and print, it is plausible therefore to utilize social media as a tool that continuously carries such messages.

4. RESEARCH PARADIGM

A research paradigm is a term coined by historian Thomas Kuhn, and defined as a set of beliefs that influence the scholars of a particular field on what they should study, how they should study it and how they should interpret the findings or results, (Bryman, 2012 cited in du Plooy-Celliers, Davis & Buizedenhout, 2014).

The term research paradigm is more commonly referred to in the natural sciences, whilst research traditions or worldviews are more commonly used in

the social sciences. It is important for a researcher to align themselves to a particular paradigm or research tradition before conducting research, as this will determine what kind of questions they will ask and what kind of process they will follow in answering those questions, du Plooy-Celliers et al (2014). As explained by du Plooy-Celliers et al. (2014), there are three main paradigms; namely, positivism, interpretivism and critical realism. Whilst, a distinction exists between the three approaches, there is still some overlapping and interaction between the approaches. Authors argue that this is because research problems are complex, and often cannot be tackled through only one research approach. Choosing one kind of paradigm is thus determined by where the researcher/scholar would like to place the most emphasis in their study.

Positivism is mainly the approach of the natural sciences and lends itself to quantitative methods. It advocates for the study of certain phenomena including social phenomena in a manner that is objective, observable and verifiable. The epistemological position of positivism is that "only knowledge confirmed by the senses can genuinely be considered as knowledge," du Plooy Celliers et al (2014:25).

The ontological position of positivism is that "there is a single, objective and stable social and physical external reality that is governed by laws," du Plooy Celliers et al (2014: 25). The metatheoretical position of positivism is that "the overall aim of scientific inquiry is to develop generalisations about causal relationships between variables," du Plooy Celliers et al (2014: 25).

The methodological position of positivism is aligned to quantitative research strategies in which the researcher uses methods that are objective, precise, quantifiable, and verifiable. The axiological position of positivism is that research should be objective and value-free, reflecting an objective view of reality, du Plooy Celliers et al (2014).

Interpretivism can be defined as the belief that people are different from objects and, thus, cannot be studied in the same way. Interpretivists are mainly concerned with gaining an understanding of human behaviour and thus this approach is located with the qualitative research methodology.

Interpretivism is dominated by a number of intellectual traditions including hermeneutics, phenomenology, and symbolic interactionism. In the main, interpretivist researchers are concerned with seeing the world through the eyes of the person they are studying, because the aim is to gain an in-depth understanding of how their subject of study interacts with and experiences day to day life.

Epistemologically, Interpretivists challenge the notion by positivists that scientific knowledge is the only form of valid knowledge. Interpretivists argue that "common sense guides people in daily living" and to understand human behaviour, a researcher should have a grasp of what people regard as common sense.

Ontologically, Interpretivists believe in the social construction of reality, meaning that reality is determined by the meanings that people ascribe to it during their own experiences and interactions with others.

Finally, the third approach is critical realism which takes aspects from positivism and interpretivism in order to demystify phenomena and thus is located within a mixed-methodology, du Plooy-Celliers et al (2014).

"...the phrase critical realism originates from- the epistemic fallacy that is reducing what we say is 'real' or exists (ontological statements) to what we can know or understand about the 'real' (epistemological statements). The real are the unobservable mechanisms that cause events. Epistemology and ontology are separate," (Warwick, 2020)

Given this explanation, for this study on food waste management, the researcher will align to the interpretivism paradigm or research tradition. The reasons for this choice is because, as earlier mentioned, this specific approach

is interested in understanding human behaviour in order to uncover certain phenomena.

According to Mustamina et al. (2020), a literature review of the body of work done on the subject food waste and food losses revealed that the majority of the studies conducted in this area were quantitative in nature. The authors found that out of 60 scientific articles sourced between 2009 and 2018, 34 articles used quantitative methods whilst 27 articles used qualitative research.

5. RESEARCH METHOD

The aim of this section is to present research methods the study applied in the answering of the research questions concerning how Shoprite and Checkers managed or failed to manage the sourcing and processing of raw materials to minimize food loss and food waste, and if the retailer contributed to food waste. Research methods include all the techniques and methods which were taken for conducting research (Mishra & Alok, 2017). These included research designs, methodology, and related ethical considerations explored in the undertaking of the approaches. Where a research design is a philosophical overarching strategy characterised by approaching a problem according to its nature, a methodology is a specific tactical approach to a problem encompassing a practical step-by-step procedure that will answer the who, what, how, where, when and why of the problem under study.

5.1. Research Design

A research design or approach refers to the overall strategy or approach chosen to integrate different components of the study in a coherent and logical way with the goal of effectively addressing the research problem (De Vos, 2006). According to Kothari (2004:14) 'it is a conceptual structure within which research must be conducted' and a strategy specifying which approach will be used for gathering and analysing the data. Because of the descriptive social and qualitative nature of the problem under study, this study applied a

secondary qualitative research design applicable to describe how Shoprite and Checkers managed or failed to manage the sourcing and processing of raw materials in order to minimize food loss and food waste. Descriptive qualitative studies describe characteristics of a subject under study (Kothari, 2004). According to Kim et al. (2017:23), they describe the 'who', the 'how' and 'where' of events or experiences from a subjective perspective'. Qualitative research, defined by Daniel (2016) as a process of interpretation of meanings, concepts, definitions, metaphors, symbols and a description of things, complements research where the structure of quantitative data fails. The advantage of qualitative designs is that they have the ability bring out deep rooted feelings and underlying meaning of particular individuals or things in the way quantitative measurement cannot.

For this study, the aim was to approach the problem in the way that can allow the research to describe how Shoprite and Checkers manages or fails to manage the sourcing and processing of raw materials in order to minimize food loss and food waste. To do that, a qualitative content analysis of secondary text data in the form of existing media materials on the Shoprite and Checkers food waste subject was applied. A procedure of this method involved a convenient sample of three online media articles sourced from the internet. The following explains how this study was undertaken.

5.2. Methodology

Qualitative content analysis steps taken to study the problem were discussed. Research methodology encompasses a step-by-step approach to the problem (De Vaus, 2006). It details procedures that were be followed to describe how Shoprite and Checkers managed or failed to manage the sourcing and processing of raw materials to minimize food loss and food waste, and if the retailer contributed to food waste in general. These steps included identifying elements associated units of measurements such as population and sampling

techniques; data collection; and data analysis techniques for the qualitative content analysis design. The following are how content analysis was undertaken to answer the research questions.

5.2.1. Population and Sampling

In any study, the first step in the methodology is to identify the population of study from which the data should be extracted. A study population involves observations on every member of that which is studied (De Smith, 2018). It is also known as a census inquiry where all that which is involved is covered, and that not a single element or parameter in that space is left to chance (Mishra & Alok, 2017). Since this research aimed to describe how Shoprite and Checkers managed or failed to manage the sourcing and processing of raw materials in order to minimize food loss and food waste - and if its selling of food products to the public at wholesale and retail stores contributed to food waste - it was most logical to identify online media material about Shoprite and Checkers food waste as the study population. From these online media materials, content was extracted and analysed.

Online media materials on the subject were drawn from the internet/population as a sample. The aim was to extract text related to Shoprite and Checkers' management of food waste out of a huge amount of texts on the subject. According to De Smith (2018), samples are made to mimic a picture of the population as a whole without the need to make observations on every member of that population.

5.2.2. Sampling and selection procedure of online media materials

In order to get sample data, the research used a convenience sampling technique to systematically get all the media materials on Shoprite and Checkers food waste into an understandable data file that can be understood and analysed. According to Lavrakas (2008), a convenience sampling

technique is a sampling method that does not apply probability principles to sample the units of measure, but sample them simply because they are "convenient" sources of data for researchers. And because the research design was qualitative, and that the intention of the study was not to draw nationally representative inferences about the population under study, randomness and strict probabilistic techniques were not adhered to when determining the sample. However, this technique showed a major disadvantage of selection bias; that is, not all online media articles that qualified to be studied were overlooked in favour of others in the sampling and extraction processes, making the sample unrepresentative. For this study, the advantage is that the non-random spread of the media material allows the researcher to choose them at will according to availability without running the risk of overlooking others.

Here samples were selected on the basis of "ease of access" (Mishra & Alok, 2017). In this case, the researcher used her discretion to extract whatever content from online media data sources to draw out a sound sample.

5.2.3. Sample Size (*n*)

Availability of content on the subject matter determined the size of the sample ($n=3$ online media articles). Content and media materials specific to Shoprite and Checkers food waste management were limited across all media spectrum.

5.2.4. Data Collection

Data collection is a stage or process where information about the study need to be gathered and measured in a systematic way (Kabir, 2016). This research used conveniently or readily available media materials (secondary data) on the subject of Shoprite and Checkers food waste. It collected and analysed content of the company's media activity over the years from three ($n=3$)

media sources. The media material was selected in accordance with their relevance to the study. The internet is a network of web-pages on news articles on many subjects including food waste management. Search engines were used to search content on the subject under study, with no limit as to the number of articles collected for the data set. Identified media content online were printed and readied to be studied and analysed.

5.2.5. *Trustworthiness*

Marshall and Rossman (1995) in de Vos (2006) assert that "all research must respond to canons that stand as criteria against which trustworthiness of the project can be evaluated. These canons can be phrased as questions to which all research must adhere to." Lincoln and Guba (1985) in de Vos (2006) highlight that in qualitative research, reliability and validity are ensured by the concept of "trustworthiness," which contains four aspects: credibility, transferability, dependability, and confirmability. In this study, the researcher used a sampling design of media materials to guard against sampling errors such as content coverage and selection bias in order to ensure high validity. The researcher selected three credible media sources whose extracted content, for transferability, are verified through reading and re-reading of the content to ensure it is viable for all occasions/settings of this research.

5.2.6. *Content Data Analysis in the form of thematic analysis*

Data analysis is a method of putting facts and figures to solve the research problem (Ashirwadam, 2014)ⁱ. More specifically, content data analysis is a procedure to analyse written and verbal material (Chron, 2021). The procedure for analysing content involved logical but flexible steps that, after collection, included determining coding categories, coding the content of those identified categories and analysing them using the thematic analysis technique. Thematic analysis is defined as method for systematically identifying, organizing, and offering insight into patterns of meaning called

themes in the data” (Braun & Clarke, 2012:2). Through using a thematic analytical procedure in content analysis, the researcher followed a qualitative design; that is, it was based on interpretive efforts of the text data.

Thematic analysis technique’s disadvantage was being less structured in method—it forced the researcher to rely mainly on her intuition to make what was expected to be a scientific judgement on the meaning of a particular text (Elo et al., 2014). Thematic analytical procedure proved to be time-consuming; for example, it required in-depth reading and rereading of text material.

Much of the analysis was manual. Thematic analysis of text followed these six stages:

THEMATIC ANALYSIS STAGE	ACTIVITY
STAGE ONE: ORGANIZING THE DATA	Ensuring data is categorized and labelled (i.e. dates, places, etc.)
STAGE TWO: READING	To get a feel of the data, research read through three online articles
STAGE THREE: GENERATING CATEGORIES, THEMES AND PATTERNS	Researcher searched for salient, grounded categories of meaning
STAGE FOUR: CODING DATA	Researcher applied coding scheme to identified categories and themes

STAGE FIVE:	Researcher evaluated the data in illuminating the questions being explored
TESTING UNDERSTANDINGS	EMERGENT
STAGE SIX:	Researcher critically challenged the emerging patterns that seem apparent in the text. Alternative patterns exist but the researcher searched for them and then demonstrated why the explanation offered was the most plausible (de Vos et al. , 2005)
ALTERNATIVE UNDERSTANDINGS	

5.3. Findings

This section shows findings of the study. Findings were obtained through a thematic analysis of qualitative content analysis. The thematic analysis procedure was a result of a six stage process that included an in-depth interrogation of text data from three collected online articles. From these articles text was extracted, collated and coded; from these coded text themes were generated and categorised into meaningful information about how Shoprite and Checkers contributes to food waste and loss; what online media reports say regarding Shoprite and Checkers' methods for reducing food loss and waste in South Africa; and what message online media articles believe Shoprite and Checkers conveys to its customers regarding food waste and loss. The following are what was found during the thematic analysis. These findings are presented according to emerging dominant themes within which meaning was interpreted.

5.3.1. How Shoprite and Checkers contributes to food waste and loss

From this research question, emerged these themes:

Theme 1: Food waste at production stages

It was found that food waste and loss happen at the agricultural or production levels in Shoprite and Checkers' supply chain. This was despite efforts made by the group to reduce food waste, such as engaging in charity activities of donating food and using technology and improving/changing customer behaviour towards food waste (e.g., removing food that showed no appeal to customers and subsequently created food waste).

Theme 2: Food waste via embedded resources

It also emerged that Shoprite and Checkers' contribution to food waste did not only affect people's livelihoods. It had economic and environmental consequences; namely, the impact on embedded resources such as water and energy. Because food is produced using water and energy, power, land, labour and capital, wastages that happen imply wastages in these embedded resources.

Theme 3: Effort to reduce food waste and loss

What also emerged from the articles is that Shoprite and Checkers made enormous effort to prevent and reduce its food wastages and losses. Thus, there are preventions measures brands like Shoprite and Checkers implement to tackle the problem of food waste; for example, waste prevention; technology use and artificial intelligence; food donations to beneficiary organizations; refrigerating of food; collaborating with other organizations to reduce food loss and waste; sourcing to consumption or farm-to-fork; training people; and converting food to biofuel/bio-diesel, among other methods.

5.3.2. What online media reports say regarding Shoprite and Checkers' methods for reducing food loss and waste in South Africa

From this research question, only this theme about methods used Shoprite and Checkers to prevent and reduce food waste and loss emerged:

Theme 4: Shoprite and Checkers' Methods of food waste prevention

Online media articles agreed that Shoprite and Checkers used these methods to reduce and prevent waste: technology use and artificial intelligence; food donations to beneficiary organizations; refrigerating of food; collaborating with other organizations to reduce food loss and waste; sourcing to consumption or farm-to-fork; training people; and converting food to biofuel/bio-diesel, among other methods.

5.3.3. How do online media articles think Shoprite and Checkers fare in terms of the healthy brand criteria when it comes their practices with regards to food waste/loss, and what message it conveys to its customers

From these two combined research questions— namely, how Shoprite and Checkers fares in terms of the healthy brand criteria, and what message it conveys to its patrons— these two themes about impact emerged:

Theme 5: Environmental impact

Through the articles it emerged that Shoprite and Checkers was an environmentally conscious brand that took care not to pollute the environment. The brand tackled food waste that may cause greenhouse gases/diversion from landfills; it donated surplus food that was fit for consumption daily to create an environmental benefit by reducing waste.

Shoprite and Checkers (Bega, 2021):

"Our delis use cooking oil in high volumes, which is sent to a centralised location where it is converted to bio-diesel".

Oelofse (2021 cited in Bega, 2021) had this to say about Shoprite and Checkers:

"Organic waste from its stores and distribution centres are increasingly managed through on-site composters and off-site biodigesters, which provide a 'clean and simple solution to managing organic and wet waste'".

Theme 6: Social impact/socially conscious

One of the themes that kept coming was the fact that Shoprite and Checkers made efforts to connect with its customers and partners in the effort to both tackle the problems of poverty/food insecurity and reduction of food waste. Within this theme, codes pointed to constructs such as social consciousness of the retailer towards communities and communication with customers on matters of the stores, the product and the mechanisms that inform customers about the product they are interested in. Shoprite and Checkers was able to engage with communities (e.g., beneficiary organizations during food donations); social benefit by alleviating hunger/poverty/food insecurity; in some ways they take measures/use technology to ensure stock is always available for customers.

South Africa Good News (2014):

"Alleviating hunger is a societal issue that requires a societal solution and we are excited to offer South Africans an opportunity to do good by supporting Kellogg's and Shoprite on this important initiative while shopping for their favourite cereal products"

Shoprite has donated 1200 meals to more than 450 charities to fight hunger and address food security. It also donated a surplus of food valued at R138 million.

6. INTERPRETATION OF FINDINGS

This chapter provides a perspective and puts in context findings from the qualitative content analysis on “describing how Shoprite and Checkers manages or fails to manage the sourcing and processing of raw materials to minimize food loss and food waste”. These findings were obtained through thematic analysis of three online media articles on Shoprite and Checkers. Findings were organised in six themes that emerged during the interrogation of the text, revealing some of the information needed to answer the research question and objective of the study.

Thus, the purpose of this discussion is to harmonize these findings from different perspectives in the field. The aim is to understand the brand Shoprite and Checkers from the broad perspective of the field of food waste and loss.

6.1. Food waste at production stages

Despite its many efforts to prevent food loss and waste, Shoprite and Checkers still find itself wasting and losing food, especially at the agricultural and production levels of the supply chain. It is worth noting, however, that this occurrence is not unique to Shoprite and Checkers. It is already known from literature (e.g., Reddy, 2020; Mustamina et al., 2020; Teoh et al., 2022) that food is mainly lost at the production stages of the supply chain all over the world. Still, this is more so a fact in middle-income countries such as South Africa than in developed countries. Li and Pan (2021) found that 40% of food production is lost between the agricultural and consumer stages in North America. They also reported that the lion’s share of the waste in that country were recorded at the consumer level. This meant that supermarkets in developed nations had such excellent post-harvest handling processes that they are only liable for wasting food at consumer levels. In other words, retailers in these countries are in control of managing food waste. They have better agro-food systems that drive the efficiency of their post-harvest

processes. These countries are compared to low income countries that lose food at primary stages of production, and depend on the often independent small-scale farmers who cannot handle the complex mechanisms of food production.

In South Africa, food is mainly lost at the agricultural stages of the supply chain (Oelofse, 2014; Reddy, 2020; DEFF & CSIR, 2021). This includes food waste at critical stages of production, such as harvesting and post-harvesting, which, in the main, include storing, packing and transporting of food before processing. This implies that food perishes before it could reach its intended consumer destination. The fact that the Shoprite Group does not directly own farms that directly supply them with produce make its contribution to food waste and loss complex. According to Louw et al., (2008), the group does not have control over wastages at these levels. This is because large-scale farmers are usually independent from supermarket chains. How they handle the food production processes can only indirectly implicate retailers like Shoprite and Checkers. This leaves retailers with the problem of having to share the burden of food wastage at critical stages of harvest and post-harvest up through to packaging and processing with the farmers without actually effecting any control (Louw et al., 2017).

6.2. Impact on embedded resources

The implication for food loss and waste at critical stages of food production do not paint a good picture for a healthy brand such as Shoprite and Checkers. This may mean the brand does not only contribute, albeit indirectly, to food getting wasted before it reaches homes, but also threatens the waste in other critical resources such as water and energy. Where food is produced using embedded resources such as water and energy, power, land, labour, capital, wastages that happen would also mean wastages in such important resources.

Martin-Rios et al. (2020) agreed with this point, arguing that wasting food has a negative impact on the environment as it means that the scarce resources required for food production such as land, water, and energy are also wasted. It emerged that locally harvested food production equates to 62% of the country's freshwater usage. At the same time, energy and power consumption has an impact that starts with production, then moves through manufacturing and consumption (Petersen, 2022). A great amount of energy and other important resources such as water is used in the food production chain processes that begin with agricultural activities and go through some post-harvest processes (Cuellar & Webber, 2010). Food waste also ends with environmental pollution as food wasted often end in landfills.

South Africa is a water scarce country (Donnenfield, 2018). Wasting water through food waste is thus one of the contributors to water waste. Despite these water insecurity risks, Donnenfield (2018) forecasts water overuse to increase in agricultural, industrial and municipal sectors— three sectors through which food production and processing are vital. At the same time, research by the World Wildlife Fund (2017) has equated wasted embedded water to filling 600 thousand Olympic swimming pools. At the same time, the energy wasted every year in South Africa for producing food that ends up wasted to be enough to power the city of Johannesburg (WWF, 2017).

6.3. Food waste prevention efforts and methods used to prevent it

The fact the Shoprite Group is closely aligned with the UN's Sustainable Development Goals, among which include to halve food waste at retail and consumer levels, show a commitment by the retailer to prevent food waste and loss. There are many way in which Shoprite and Checkers make efforts to prevent food waste; some of which include technological measures such as artificial intelligence. Others include the retailer's network of relationships with other interested parties in food waste reduction, and consumers. For example,

Shoprite and Checkers has partnered with Kellogg's, a global food company, to alleviate children's hunger by launching a campaign that aims to donate 1 million meals to South Africans in need (South Africa Good News, 2014). Some of the ways in which Shoprite and Checkers make efforts to reduce food waste include: food donations to beneficiary organizations; refrigerating of food and other cooling and storage methods; sourcing to consumption or farm-to-fork; training people to better observe and conserve food; and converting food to biofuel/bio-diesel, among other methods.

With the advent of technology, Shoprite and Checkers' harnessing of predictive analytic tools such as artificial intelligence has greatly improved the retailer's turnaround towards food waste reduction and prevention (BusinessTech, 2022). According to Raghubir (2022 cited in Petersen, 2022: 2), "artificial intelligence and machine learning helps Shoprite and Checkers predicts sales of certain items and having replenishment orders on hand". Artificial intelligence also helps Shoprite and Checkers interact better with their customers; they are able to predict behaviour towards certain products. This helps them not to overproduce food that would not be bought by customers at certain periods, thus helping the retailer to save food that would otherwise be wasted. With South African households likely to throw away greater quantities food, such efforts can help change consumer behaviour toward food waste (Petrescu-Meg et al., 2019).

6.4. Healthy brand with purpose: socially and environmentally conscious

Mustamina, et al. (2020) has already alluded to the fact that food waste does not only impact the economic sector of the country, but also affects the environmental and social sectors too. A brand like Shoprite and Checkers, for it to stay a healthy brand with purpose, is obliged to go beyond economics and profit. It is obliged to be socially and environmentally conscious. As part of the United Nations Sustainable Development Goals the retailer has the

responsibility and duty to recognise the social, environmental and economic effects of food loss and food waste in the regions where it operates (Bega, 2021). In other words, the retailer recognises the impact on the food waste has on the environment, and how such wastages also invoke risks of food insecurity among many of its patrons.

6.4.1. Socially conscious

To be socially conscious came out as one of the strongest ways Shoprite and Checkers keeps its ethics and social responsibility checked. As already alluded, Shoprite and Checkers was able to engage with communities (e.g., beneficiary organizations during food donations; social benefit by alleviating hunger/poverty/food insecurity; in some ways they take measures/use technology to ensure stock is always available for customers). Through the use of technology and networks of relationships with both likeminded partners and consumers, Shoprite and Checkers was able to remain relevant and informed about its business and the communities in which they operated. Keeping consumers on the loop about changes in the stores and about their favourite products has helped the retailer to effectively lower food waste. Some of the communication measures, like, for example, instilling technology to influence behaviour change from consumers, were effective. From the literature, the study by Young et al. (2018) showed that messages carried on a combination of communication channels including social media and repeated over a period of time had a significant impact on the levels of food waste reported by consumers. Thompson et al. (2020:2) also recognised that consumer communication that goes beyond improving expiry-date knowledge and addresses the multifaceted nature of related risk perceptions and conceptions of date-label trust will be required". The overall interaction with customers and the community has put the retailer in a position that gives it a purpose in its operations.

The social impact of Shoprite and Checkers also include its role in minimizing food waste by donating food to charities and organizations that needs them. For example, the retailer set a target of supporting 450 local beneficiary organizations with R100-million in surplus donations, including non-food donations (Bega, 2021). The donations have enabled the Shoprite Group to reduce food waste.

6.4.2. Environmentally conscious

Findings revealed that Shoprite and Checkers observed the environment it operated in by tackling food wastages destined to cause greenhouse gases. This is because the retailer understands environmental bio-hazards emanate from food waste by retailers and the agricultural sector in general, and ultimately contribute to global warming. It has done this by diverting food waste away from landfills; either through donations of surplus food to charities or converting perishables to dried food for animals. One of the most important methods the retailer used to reduce food waste was to convert potential wastages to biofuels. Excess of food like cooking oil and other organic wastes have been converted to biodiesel and compost (Petersen, 2022).

7. ETHICAL CONSIDERATIONS

Conducting research is a sensitive process that involve people and information that can either be harmed or used to harm others. Therefore, the process demanded that the researcher take considerable steps in going through the methodologies. To make sure that this research complied with established ethical standards of research practice, the following was followed, where necessary: issues of confidentiality regarding information that will be provided by other parties such as owners of the online media content extracted online. The research will also discuss issues of anonymity to protect the identities of participants/respondents (journalists/staff reporters or owners of online content) or information used in this research.

7.1. Identity and confidentiality

Confidentiality refers to a condition where the researcher knows the identity of a participant or anyone involved in the research, but must take steps to protect that identity from being discovered by others. In this research, the researcher took steps to protect the identity of authors of the online content material; namely, journalists/staff reporter/owners of the content. This was done by omitting the use of personal names, contact address and other personal information in data entry during data collection. A code name or a pseudonym such as “article 1” was used to refer to them and their works.

7.2. Anonymity

Unlike confidentiality, anonymity refers to the situation where identity of participants is not known to the researcher. This was the case during the extraction of the online material content with authors of the content material unrevealed. Authors were only referred to as “article”, omitting their personal names or titles of their work.

7.3. Privacy

Privacy involves protecting authors’ right to their personal information. These was observed. Authors were not contacted for any information that was personal.

7.4. Security of documents

Because published online articles are open to be accessed by the public and to be used for research, it was not necessary to store and encrypt the recorded articles in hard copies for a required period of five years, as required for any information collected by research. However, the collected and analysed data will not be published without consent of the authors. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable.

7.5. Publications of data

The only time the data will be published, anonymously that is, is when the researchers involved do so for no other purposes but research report, journal articles and/or conference proceedings. Anonymity in the publication of such data means that authors' names, images or any physical identifier to the persons would not be compromised in such a report.

8. LIMITATIONS OF THE STUDY

The objective of this study was to describe the extent to which Shoprite and Checkers managed or failed to manage the sourcing and processing of raw materials to minimize food loss and food waste, and if the retailer contributed to food waste. To achieve this aim the study applied descriptive qualitative content analysis, a research method that limits the research to the description of media content only, to uncover the truth. However, this method had its own external validity disadvantages, such as, for example, the transferability of the research. The small sample of online articles made it difficult for the research to transfer findings to other contexts.

Due to cost and time constraints the researcher would have wished to extend and expand the study to an explorative quantitative study where hypotheses and variables believed to be involved in the management of food waste would be measured. Mixed methods design would have better representivity and credibility of findings.

The researcher also feels the opinions of industry experts on the matter are important to uncovering the truth behind food waste in South Africa. The lack of expert involvement in the study is a regrettable shortcoming of this study. This also means that the study also fails to cover the retail industry as a whole; the results obtained from the content analysis, which was also acquired

through a limiting and often biased convenience sampling technique, means the representativeness of the results are compromised. To mitigate against these shortcomings, the researcher hopes that the preliminary results of these study act as precursor to a much larger study that can incorporate all the missing aspects detailed above.

9. CONCLUSION

This research has managed to uncover how Shoprite and Checkers, as the biggest food retailer on the African continent, managed the food waste during food production. Although the retailer does not control the independent farms and means of production at the primary production levels, it has shown great responsibility in fighting food waste and lost in its operations. The relationship the retailer has with its customers, communities and other stakeholders and partners in the business was clear with their interaction with beneficiaries, helping customers change behaviour against wastages and abiding by the international call towards food waste management and food security.

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THEMATIC ANALYSIS OF SHOPRITE/CHECKERS FOOD WASTE MANAGEMENT

Extract from online news/articles (exact text)	Codes/description of content/text	Perception direction (negative or positive)
Research Question 1: How do online media articles perceive outlets (like Shoprite/checkers) that sell food to the public at wholesale/retail establishments to be contributing to food waste?		
Article 1: Waste not only affects livelihoods, it has economic and environmental consequences, namely on water and energy use. Locally harvested food production equates to 62% of the country's freshwater usage, while energy and power consumption has an impact that starts with production, then moves through manufacturing and consumption. Shoprite/Checkers measures include waste prevention, artificial intelligence, food donations, and creation of circular economies with waste products. The group's Sustainability manager, Sanjeev Raghubir, said Shoprite wanted to prevent food wastage before it had a chance to start. Artificial intelligence and machine learning helps predicts	• They don't know how/believe it doesn't contribute to food waste/loss • Food wastages/losses at harvest/production/processing, retail and consumption levels • Via other means that contribute to food wastages, such as water and energy • Make effort to reduce/prevent/mitigate against/deal with food waste/loss	Positive => according to this article, Shoprite/Checkers is not contributing to food waste; in fact they prevent food waste using intelligent methods such as artificial intelligence and machine learning and food donations

sales of certain items and having replenishment orders on hand, he said. Replenishment orders are placed automatically to ensure stock is always available for customers while simultaneously reducing food waste. Shoprite donates more than 120 000 meals to more than 450 charities to fight hunger and address food security. In the past year, it donated surplus food valued at R138 million. It also facilitates the donation of surplus fruit and directly from farms and charities. Shoprite sends about 44 tons of food waste, mainly dried goods such as pasta, cereals and flour, to be converted to animal feed, while excess cooking oil and organic waste have also been converted to biodiesel and compost. The Shoprite Group is closely aligned with the UN's Sustainable Development Goals, including the target to halve food waste at retail and consumer levels and reduce food losses along the food chain by 2030 – a goal it is on track to achieve.		
Article 2: Kellogg's, a global food company, and Shoprite, the largest supermarket retailer on the African continent, are partnering to alleviate children's		

hunger by launching a campaign that aims to donate 1 million meals to South Africans in need. Kellogg's has been donating food to feed approximately 1 600 children every school day at Early Childhood Development Centres (supported by Shoprite since 2020), as well as donating food monthly to vulnerable communities served by Shoprite's fleet of Mobile Soup Kitchens. Since the launch of the Better Days Programme in 2014, Kellogg's has donated 20 million meals. "Alleviating hunger is a societal issue that requires a societal solution and we are excited to offer South Africans an opportunity to do GOOD by supporting Kellogg's and Shoprite on this important initiative while shopping for their favourite cereal products", says Zandile Mposelwa, Kellogg's South Africa Corporate Affairs Director. "We have robust hunger relief programmes in place to strengthen food security in vulnerable communities across South Africa. By collaborating with companies such as Kellogg's, we can make an even greater impact", said Sanjeev		
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Raghubir, Sustainable Manager for Shoprite Group.		
Article 3: Retailers Shoprite, Woolworths and Pick n Pay are aligned to the United Nations Sustainable Development Goals, specifically with goal 12.3, which aims to halve the global food waste at retail and consumer levels and reduce food losses along the food chain by 2030. The Shoprite Group told the <i>Mail & Guardian</i> that it recognises the social, environmental and economic effects of food loss and food waste in the regions where it operates. “Apart from the social issues related to food losses and waste in a region where significant numbers of people go to sleep hungry, Shoprite acknowledges the wastages of embedded resources (water, energy, land, labour and capital) and the generation of greenhouse gases from landfilling of food waste”. The group, it said, adopts a hierarchical approach in dealing with food losses and food waste, “reviewing our entire value chain from research and design, and sourcing to consumption (that is, from farm-to-fork) to identify opportunities to reduce food losses and waste”. This include		

collaborating with other organizations “equally committed” to addressing the challenges and training and developing people across the organization to become “champions” in the reduction of food losses and food waste. Shoprite is a core signatory to the Consumer Goods Council of South Africa’s food loss and waste voluntary agreement. Pick n Pay and Woolworths, too, are core signatories to the agreement, which was launched in September 2019 to drive a sustainable commitment from local food manufacturers, distributors and retailers to prevent and reduce food waste. Shoprite said as its data analytics develop, “we are able to identify food waste hotspots and intervene to reduce food waste”. In the past year, it had made great progress in reducing food waste by optimizing the range of products offered in our delis. After analysing customer behaviour, it removed food that showed no appeal to customers and subsequently created food waste. “We removed 60% to 70% of low-volume lines,” the company said, explaining how this cut food waste in its delis by 11%.		
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Its bakeries, too, have shifted from large-batch production in its stores to buying high-quality frozen products that only require baking. “This enables us to bake smaller batches, which guarantees freshness, availability and less food waste”. To improve its forecasting and ordering capabilities in fresh fruit and vegetables, the group reviews its range seasonally, helping to reduce food waste year on year.

Various business departments have worked together to implement an advanced forecasting model, which uses artificial intelligence and machine learning to automatically place accurate replenishment orders for individual stores based on a multitude of event parameters and predictive analytics. “The objective of the project is to forecast future demand and make sure that what stores order reflects real customer demand. This will ultimately reduce food waste.”

Employees are trained to refrigerate perishables, frozen produce, fruit and vegetables and convenience products within 10 minutes of delivery, while employees in Gauteng and KwaZulu-Natal have been trained on surplus food donations in the last year. “Through

this training intervention we have seen an increase in the amount of surplus food donated ... Our delis use cooking oil in high volumes, which is sent to a centralised location where it is converted to bio-diesel.” Organic waste from its stores and distribution centres are increasingly managed through on-site composters and off-site biodigesters, which provide a “clean and simple solution to managing organic and wet waste”. The Shoprite group donates surplus food that is fit for consumption daily. “It creates an environmental benefit by reducing waste and a social benefit by alleviating hunger. Reusable surplus food collection boxes are used to transport food, helping to further reduce environmental impact on food waste. It set a target of supporting 450 local beneficiary organizations with R100-million in surplus donations, including non-food donations. “We are proud to have met these targets by supporting 452 beneficiary organizations with donations to the value of R138m in the last year. These donations have enabled the Shoprite Group to provide more than 40-million meals in the last year,”		
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from 29 million meals in 2020. Donations reduce food waste, but wastages often occurs at the agricultural level in the group's supply chain. Its fruit and vegetables and distribution arm, Freshmark, has started to link beneficiary organizations directly with fresh produce suppliers. "In the last year, Freshmark facilitated direct donations to the value of R1.6 million to 11 beneficiary organizations."		
Research Question 2: What do online media reports say regarding Shoprite/Checkers' methods for reducing food loss and waste in SA?		
Article 1: Waste not only affects livelihoods, it has economic and environmental consequences, namely on water and energy use. Locally harvested food production equates to 62% of the country's freshwater usage, while energy and power consumption has an impact that starts with production, then moves through manufacturing and consumption. Shoprite/Checkers measures include waste prevention, artificial intelligence, food donations, and creation of circular economies with waste products. The group's Sustainability manager, Sanjeev Raghubir, said Shoprite wanted to	• Use technological methods such as artificial intelligence, machine learning, • Use waste prevention strategies such as food donations to beneficiary organizations, creation of circular economies with waste products • Creative strategies such as using cold rooms/refrigerate food • Collaborating with other organizations to reduce food loss/waste • Hierarchical approach of dealing with food waste/loss (sourcing to consumption or farm-to-fork) • Training of staff • Creative ways such as converting food surplus to bio-fuel/bio-diesel	

prevent food wastage before it had a chance to start. Artificial intelligence and machine learning helps predicts sales of certain items and having replenishment orders on hand, he said. Replenishment orders are placed automatically to ensure stock is always available for customers while simultaneously reducing food waste. Shoprite donates more than 120 000 meals to more than 450 charities to fight hunger and address food security. In the past year, it donated surplus food valued at R138 million. It also facilitates the donation of surplus fruit and directly from farms and charities. Shoprite sends about 44 tons of food waste, mainly dried goods such as pasta, cereals and flour, to be converted to animal feed, while excess cooking oil and organic waste have also been converted to biodiesel and compost. The Shoprite Group is closely aligned with the UN's Sustainable Development Goals, including the target to halve food waste at retail and consumer levels and reduce food losses along the food chain by 2030 – a goal it is on track to achieve.		
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Kellogg's, a global food company, and Shoprite, the largest supermarket retailer on the African continent, are partnering to alleviate children's hunger by launching a campaign that aims to donate 1 million meals to South Africans in need. Kellogg's has been donating food to feed approximately 1 600 children every school day at Early Childhood Development Centres (supported by Shoprite since 2020), as well as donating food monthly to vulnerable communities served by Shoprite's fleet of Mobile Soup Kitchens. Since the launch of the Better Days Programme in 2014, Kellogg's has donated 20 million meals. "Alleviating hunger is a societal issue that requires a societal solution and we are excited to offer South Africans an opportunity to do GOOD by supporting Kellogg's and Shoprite on this important initiative while shopping for their favourite cereal products", says Zandile Mposelwa, Kellogg's South Africa Corporate Affairs Director. "We have robust hunger relief programmes in place to strengthen food security in vulnerable communities across South Africa. By		
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Research Question 3: How do online media articles think Shoprite/Checkers fare in terms of the healthy brand criteria when it comes their practices with regards to food waste/loss Research Question 4: What message about food loss/waste does online media believe Shoprite/Checkers convey to its customers?		
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Pay diverted more than 60% of all waste from landfills, reduced our food waste year on year by 20% and donated more than 800 tonnes of food to the NGOs.” It has a range of initiatives to prevent food waste, which includes more accurate replenishment, better cold chain management and several shelf-life extensions projects. “A key deliverable is to ensure that food that has passed its sell-by date, but not its expiry date, is donated to registered beneficiary organizations.”		
Other emerging themes		
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Raghubir, said Shoprite wanted to prevent food wastage before it had a chance to start. Artificial intelligence and machine learning helps predicts sales of certain items and having replenishment orders on hand, he said. Replenishment orders are placed automatically to ensure stock is always available for customers while simultaneously reducing food waste. Shoprite donates more than 120 000 meals to more than 450 charities to fight hunger and address food security. In the past year, it donated surplus food valued at R138 million. It also facilitates the donation of surplus fruit and directly from farms and charities. Shoprite sends about 44 tons of food waste, mainly dried goods such as pasta, cereals and flour, to be converted to animal feed, while excess cooking oil and organic waste have also been converted to biodiesel and compost. The Shoprite Group is closely aligned with the UN's Sustainable Development Goals, including the target to halve food waste at retail and consumer levels and reduce food losses along the food chain by 2030 – a goal it is on track to achieve.		
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THEMATIC ANALYSIS STAGE 2:

Generating Themes and interpreting findings

Codes	Themes	Meaning/finding
Research question 1 codes: how does Shoprite contribute to food waste?		
- Food wastages/losses at harvest/production/processing, retail and consumption levels - Via other means that contribute to food wastages, such as water and energy - Make effort to reduce/prevent/mitigate against/deal with food waste/loss	Food waste at production	Food waste happens at agricultural/production levels
	Food waste via embedded resources (water, energy, land, labour and capital)	Because food is produced using water and energy/power/land/labour/capital, wastages that happens means implications for wastages in water/energy/power/land/capital/labour
	Effort to reduce food waste/loss	There are preventions measures brands like Shoprite implement to tackle the problem of food waste, e.g., waste prevention, technology use/artificial intelligence, food donations to

		beneficiary organizations, refrigerating of food, collaborating with other organizations to reduce food loss/waste, sourcing to consumption or farm-to-fork, training people, converting food to biofuel/bio-diesel, etc.
Research question 2 codes:		
• Use technological methods such as artificial intelligence, machine learning, • Use waste prevention strategies such as food donations to beneficiary organizations, creation of circular economies with waste products • Creative strategies such as using cold rooms/refrigerate food • Collaborating with other organizations to reduce food loss/waste • Hierarchical approach of dealing with food waste/loss (sourcing to consumption or farm-to-fork) • Training of staff • Creative ways such as converting food surplus to bio-fuel/bio-diesel	Methods of food waste prevention	There are preventions measures brands like Shoprite implement to tackle the problem of food waste, e.g., waste prevention, technology use/artificial intelligence, food donations to beneficiary organizations, refrigerating of food, collaborating with other organizations to reduce food loss/waste, sourcing to consumption or farm-to-fork, training people, converting food to biofuel/bio-diesel, etc.
Research question 3 and 4		
• Environmentally conscious/tackle food waste that may cause greenhouse gases)	Environmentally conscious/impact	Tackles food waste that may cause greenhouse gases/diversion from landfills; donates surplus food that is fit for consumption daily to create an

• Socially conscious/engaging communication/collaboration/interaction with consumers/solving customer issues/ Social responsibility/fighting hunger/alleviating poverty • Never takes more/giving to people/beneficiary of donations		environmental benefit by reducing waste
	Socially conscious	Shoprite is able to engage with communities (e.g., beneficiary organizations during food donations); social benefit by alleviating hunger/poverty/food insecurity; in some ways they take measures/use technology to ensure stock is always available for customers