

Research Methodology

Research Report

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Food Waste During A Global Pandemic:

A qualitative study on food waste management in South Africa's retail sector and the effects of Covid-19

Abstract

Every year a third of the food produced globally is wasted. In South Africa, an estimated total of 10 million tons of wasted food adds to this statistic (World Wide Fund for Nature, 2017). This staggering amount depicts a grim reality for many South Africans, where poor food waste management has a sweeping impact across the country, further straining the disproportionate access to food. The embedded loss in resources such as water, energy, and labour used to produce food that is ultimately wasted, comes at a high cost to the South African environment and economy. South Africa's retail sector plays a large role as a major contributor to food waste (20%) within the country (World Wide Fund for Nature, 2017). Although access to food is a Constitutional right, millions in both urban and rural areas continue to suffer daily from hunger and malnutrition - a reality that has been exasperated by the Covid-19 pandemic. As a leader in the food retail sector, Woolworths has made significant contributions to the reduction of food waste within its business, as well as consistent donations to local food waste initiatives. However, the lack of collective knowledge, reporting transparency and effective action within the food industry highlights the necessity for further local studies on food waste management, the effects of a crisis on food waste, and how improvements can be implemented. Farmers, food manufacturers, distributors, food retailers and households all regularly waste excess foods, which could be otherwise used and redistributed to help alleviate hunger within South Africa (World Wide Fund for Nature, 2018). Adopting a Critical Realist perspective, this study aims to use qualitative research methods and comparative analysis to propose recommendations vis-a-vis how Woolworths and the food sector as a whole can further improve its food waste management practices for the betterment of South Africa.

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1. Introduction and Context of the study

This research proposal considers food waste management in South Africa's retail sector as the main subject of its study. Specific focus is given to the Woolworths brand for gaining insight and making recommendations in regards to how the brand can innovate its food waste management practices. While this analysis will look to both local and global case studies, efforts will be made to contextualise implementation for the South African food industry. Additionally, the study plans to delve into understanding the impact of the Covid-19 pandemic on food waste.

Background will be given on the state of food waste globally. Thereafter, to provide the context of the study, the research paradigm will be identified with given justification as to how it will guide the research process. The rationale of the study will then be discussed, which alludes to the gaps in research that could be addressed by the study research. This is followed by the literature review which uncovers the impact of food waste in South Africa, and how Woolworths currently aids in combating food waste within the retail sector. Studies will be analysed and compared in order to elaborate on the identified gaps of knowledge, leading to the problem statement, research goal and research questions. The research methodology will then be determined, followed by the analysis of data and findings.

Lastly, the ethical considerations, limitations and trustworthiness of the study will be covered.

1.1 Background

Food waste can be defined as uncooked or cooked food materials that are discarded throughout the food value chain. This includes food wasted during harvesting, manufacturing, distribution, retail and in consumer households. Food loss refers to food that has decreased in quality, spoilt or spilled as result of actions in the production, processing, retail or consumption stages of the supply chain (Nahman, de Lange, Oelofse and Godfrey, 2012).

Every year a third of the food produced globally is wasted. In South Africa, an estimated total of 10 million tons of wasted food falls within this statistic (World Wide Fund for Nature, 2017). This staggering amount depicts a grim reality for many South Africans, where poor food waste management has a sweeping impact across the country, further straining the disproportionate access to food. The embedded loss in resources such as water, energy and labour used to produce wasted food comes at a high cost to the South African environment and economy. South Africa's retail sector plays a large role as a major contributor to food waste (20%) within the country (World Wide Fund for Nature, 2017).

Although access to food is a Constitutional right, millions in both urban and rural areas continue to suffer daily from hunger and malnutrition. As a leader in the food retail sector, Woolworths has made significant contributions to the reduction of food waste. However, the lack of collective knowledge, reporting transparency and effective action within South Africa's food industry highlights the necessity for further local studies on food waste management and how improvements can be implemented. Farmers, food manufacturers, distributors, food retailers and households all regularly waste excess foods, which could be otherwise used and redistributed to help alleviate hunger within South Africa (World Wide Fund for Nature, 2018).

1.2 Research Paradigm

A research paradigm acts as a researcher's lens through which they see the world (Kivunja and Kuyini, 2017). "A paradigm is a basic belief system and theoretical framework, with assumptions about ontology, epistemology, methodology and axiology" (Rehman and Alharthi, 2016: 51). Research paradigms represent our way of understanding the nature of our reality, articulating our beliefs, guiding our methods of research and how we go about analysing data. Understanding the following four elements, helps one grasp the assumptions, beliefs, norms and values that a paradigm holds (Kivunja and Kuyini, 2017).

Ontology forms a part of the foundation of research, referring to the nature of our beliefs about reality. The ontological question allows a researcher to inquire what kind of reality exists, is it a singular and verifiable truth, or socially constructed by multiple realities? Is reality constructed by one's own mind or is it objective? (Rehman and Alharthi, 2016). This concept helps to frame a researcher's thinking about the research problem, its

importance and different approaches to solving the research question (Kivunja and Kuyini, 2017).

Epistemology can be defined as “the branch of philosophy that studies the nature of knowledge and the process by which knowledge is acquired and validated” (Rehman and Alharthi, 2016: 52), as well as how this gathered knowledge can be communicated. An ontological belief system guides a researchers epistemological assumptions. As such, if a researcher assumed that reality is socially constructed by multiple realities, they would then conduct their study by engaging with subjects and assess phenomena within context - rather than from an objective scientific detachment (Rehman and Alharthi, 2016). Essentially, epistemology defines what is truth to a researcher and the justification (Kivunja and Kuyini, 2017).

Methodology refers to the research design, methods, approaches and processes used in a study (Kivunja and Kuyini, 2017). Concerned for how research should be undertaken, the research methods must be appropriate for gathering and studying data in order to develop insight on a particular phenomena. The type of data desired thus guides the decision on the necessary research tools (Du Plooy-Cilliers, 2014).

Axiology refers to the nature of ethical behaviour, what ethical issues should be considered when conducting research, and defining the concepts of right from wrong. It is therefore important to consider the human rights of those participating in the research, and how to best respect them. Questions to be considered are how the researcher shall secure the goodwill of participants? How can one avoid the risk or harm of those involved, psychologically, physically, financially, socially and legally? This concept is based on the understanding that all humans should be treated with dignity (Kivunja and Kuyini, 2017).

There are three different approaches to research, namely; Positivism; Interpretivism; and Critical Realism.

Positivism

Positivism is grounded in the scientific method of investigation. It postulates that experimentation, observation and reason based on experience is the only legitimate basis for understanding human behaviour and nature (Kivunja and Kuyini, 2017). Under

the Positivist approach, essentially all subjects, natural or social, are studied objectively with the aim of identifying the cause and effect relationship between A and B. Positivists assume that reality exists independently of humans, governed by fixed laws (Rehman and Alharthi, 2016). "Research located in this paradigm relies on deductive logic, formulation of hypotheses, testing those hypotheses, offering operational definitions and mathematical equations, calculations, extrapolations and expressions, to derive conclusions" (Kivunja and Kuyini, 2017: 30). However, there are limitations to this approach. Though Positivism is appropriate for scientific study of natural phenomena, it is ill-suited for individuals and social phenomena. Positivists attempt to make explanations based on measurable outcomes, assuming that results obtained should be applicable to other situations - resulting in generalisations (Kivunja and Kuyini, 2017). Social phenomena however, are driven by complex laws that govern individuals, their relationships with one another, and their relationships with society. It lacks the order and regularity found in nature that allows Positivism to be most effective. Thus, striving to understand the social world like the natural world by applying scientific research methods to social phenomena can be viewed as 'naive' (Rehman and Alharthi, 2016).

Interpretivism

Interpretivism is a response to Positivism, aiming to provide an alternative to the notion that only a singular verifiable reality exists, independent of human senses. Interpretive ontology rejects any fixed foundational standards by which truth can be universally defined. In contrast, interpretivists believe in multiple socially constructed realities (Rehman and Alharthi, 2016). Interpretivism challenges the idea of objective knowledge and objective truth, in favour of subjective epistemology. Facts are seen as fluid and embedded within meaning systems - essentially what is factual is dependent on the context and interpretation (Du Plooy-Cilliers, 2014). To find meaning and names for different social phenomena, individuals interact with other individuals, and different perspectives on an issue are respected. It requires that social phenomena be understood through the personal perspective of the subject rather than that of the observer (Rehman and Alharthi, 2016). As a result, qualitative data is sought after and gathered, from which a researcher tries to identify patterns that can help one better understand phenomenon and develop theory (Kivunja and Kuyini, 2017).

Critical Realism

Critical realists assume that reality exists as a byproduct of the cultural, political, ethnic, gender and religious factors that interact to form a social system. The research paradigm focuses on social injustice, seeking to address the political, social and economic problems that drive conflict, struggle, social oppression, and inequality. Thus, this approach to research is a transformative paradigm, in that it seeks an emancipatory goal (Kivunja and Kuyini, 2017). It is also subjective in that it acknowledges that no object can be researched without being influenced by the analyst. Researchers therefore, are self-conscious of their own assumptions and communicate so when entering into a study. Dissimilar to Positivism and Interpretivism, this research paradigm's aim of bringing to light the beliefs and behaviours that limit human freedom, drives its confrontation and questioning of disinformation and oppressive structures in pursuit of equality, accuracy and validity. Research methods used are qualitative and/or quantitative techniques. For quantitative methods used, subjects of study are engaged in dialogue to develop understanding and shift outlook on actions and social systems that keep people subjugated. Additional methodologies employed are critical ethnography, critical discourse analysis, action research, and ideological critique (Rehman and Alharthi, 2016).

It can be argued that each research paradigm could be critiqued as limiting and ill-fitted, depending on the proposed study's purpose and objectives. One could reason that Positivism serves technical interests, and Interpretivism serves practical interests, while Critical Realism holds emancipatory purpose (Ogland, 2017). With this context, Critical Realism is the chosen research paradigm for conducting this study. Despite its limitations, the approach is well suited for the issue of food waste management, which poses social-political, environmental and economic implications. These implications affect the quality of life and freedom of millions globally, suffering from malnutrition, starvation, and other illnesses as a consequence. Critical realism can be used to question this reality, how it can be avoided and the situation improved - addressing inequality. The paradigm also gives room for critiquing the limitations of the study and acknowledging how that may influence outcomes. This is important, as it aids other researchers that may make use of the report in further studies to improve food waste management in South Africa.

Its methodologies, such as critical ethnography, questions assumptions about race, gender, culture and economy, shifting awareness. This is appropriate to this study's analysis of public attitudes towards food waste and food waste management - attempting to understand and improve consumer behaviours. Additionally, the research paradigms use of action research (the process of identifying an immediate issue, planning means of intervention, implementing, and observing results) can provide real world practicality to this study. Lastly, in alignment with the aims of Critical Realism, this research seeks to obtain knowledge that can impact lives for the better - uncovering the harmful practices and perceptions that play a role in food waste in South Africa (Rehman and Alharthi, 2016).

1.3 Rationale of the Study

The negative impacts of poor food waste management in South Africa are far reaching. Food waste has significant environmental, socio-political and economic implications within the country, underscored by the 13 million South Africans routinely experiencing hunger (World Wide Fund for Nature, 2018).

Discussed further in the literature review, existing research on global food waste shows contradictions in statistics and insights. The food sectors most responsible for food waste vary across countries (World Wide Fund for Nature, 2017). This conflicting information points to a gap in literature and a need for more contextualised food waste management research to address the unique challenges of South Africa's food industry.

As food waste can occur across the food value chain, this results in the loss of income for the several stakeholders that make up the food industry - farmers, traders, manufacturers, distributors, retailers and consumers. Additionally, the wasted labor, time and energy involved negatively effects the economy as it leads to stakeholders' (such as farmers and retailers) attempting to make up the loss through price inflations and staff reductions (World Wide Fund for Nature, 2017). Increase in food prices have the greatest impact on lower income communities, as the cost of groceries account for the larger share of their monthly income. As a result, access to food can become increasingly difficult, leading to nutritional deficiencies and adverse health implications (Gayton, 2019). However, with better food waste management practices, farmers and retailers can grow their revenue, gain tax savings from donations, avoid gate fees charged at landfills, and optionally sell their surplus food. There is also a marketing

benefit vis-a-vis the positive image gained by brands who practice and communicate their food waste management policies transparently (World Wide Fund for Nature, 2018).

The cost of food waste bares an environmental impact as well. Land unduly deforested for food production or degraded through unsustainable agricultural practices place animals and plant life at risk. The water wasted and polluted also adds to this cost. Furthermore, the decomposition of food waste at landfills, and the embedded waste in agricultural production, harvesting, processing, and delivery all contribute to increases in greenhouse gas emissions (Murali, 2018). Saving and redistribution of surplus foods from both farms and retail can greatly reduce waste. This excess food may be donated to charities that address hunger and malnutrition in South Africa, increasing their reach.

Even more pressing is understanding the challenges to addressing food waste in times of crisis. Food waste and food insecurity has risen globally amid the Covid-19 pandemic (Royte, 2020). The crisis has led to a spike in global consumer anxiety, driving masses of people to hoard food supplies. Given the unprecedented nature of the virus there is an urgent need for research on its impact on food waste. The collective response to the spread of the Covid-19 virus, from panic buying to government interventions, has no doubt inflated the amount of food lost globally (Royte, 2020). This is at a time where food insecurity in countries like South Africa continues to rise. As anxious consumers come to realise their inability to consume their excess purchases before their expiration, what are the implications on those who were not able to purchase food amidst the panic? What are the implications on impoverished communities who struggle to afford basic nutrition, and how has the sudden hike in wasted food impacted the charities that serve them? (Royte, 2020). A crisis may shift, and possibly balance food waste statistics between the sectors of the food value chain in South Africa - stressing the need for collective action. Analysis of human behaviours that emerge in times of crisis can provide valuable information and knowledge for governments on how to better plan and prepare for the future. The knowledge gained can also aid food related businesses such as Woolworths in the development of crisis policies that protect brands from the loss of stock and ensure prevention of food waste. Analysis of these embedded costs and discovery of prevention measures can draw attention to the true implications of food waste in South Africa.

Each year the world produces enough calories to feed the global population (World Wide Fund for Nature, 2017). However, due to the inefficiencies and complexities of the food system, there are still millions in South Africa and globally who suffer from hunger and malnutrition. These deficiencies, in combination with a growing world population, results in a consistent increase in food demand - with estimates that food production would need to increase by 70% in order to compensate for the current levels of food waste and feed a population of 9 billion people by 2050 (World Wide Fund for Nature, 2017). This required increase in production in order to meet future demand emphasises the staggering shortcomings of current food waste management practices. In light of the limitations of past research, and the expressed benefits of research with greater contextual relevance and retail specific recommendations - how Woolworths can improve its food waste management practices will be investigated.

1.4 Theoretical Framework - The Healthy Brand Criteria

The Healthy Brand criteria is a theoretical model designed for assessing a brand's positioning and overall value. How a brand takes sustainable and responsible actions has increasingly grown in significance to consumers, making it more important that brands adapt and implement environmentally conscious practices (Averntaplin, 2015).

The criteria will be used below to assess the brand health of Woolworths South Africa:

A Healthy Brand Has A Particular Meaning

The purpose of a healthy brand should be clear and specific, embracing a set of values, defining the meaning behind their existence. The brand's meaning guides all of its actions (Averntaplin, 2015). Believing in the importance of purpose and values, Woolworths values are as follows (Woolworths Holdings Limited, 2020):

Being Responsible - Doing the right thing, the right way.

Customer Obsessed - The customer always comes first.

Inspirational - Always looking ahead and taking the lead.

Collaboration - Working and growing together.

Quality - Commitment to quality.

A Healthy Brand Has A Unique Meaning

The more unique a brand's identity and values, the greater its differentiation and positioning (Averntaplin, 2015).

Woolworths commitment to putting customers first and dedication to food waste management has made the retailer a market leader in South Africa. Its sophisticated and modern in-store shopping experience, exceptional quality in private label products, and offering of fresh fruit and vegetables, has differentiated the brand from other local supermarkets (Woolworths Holdings Limited, 2020). These attributes strengthen Woolworth's identity and unique offering.

A Healthy Brand Is An Effective & Engaging Communicator

In order for a brand to be healthy it needs to be able to effectively communicate its message in a way that resonates with its stakeholders, achieving a shared understanding of the brand (Averntaplin, 2015).

Woolworths delivers its message on sustainable living through its healthy food offerings and design language instilled throughout its physical stores, packaging, and website. Their aesthetic and minimal design give the brand an air of both sophistication and easy-living that is engaging and offers a distinct experience. This branding, imbued with sustainable living, resonates well with consumers who relate to the lifestyle Woolworths has come to represent.

A Healthy Brand Adds Value to the Lives of People

Brand health needs to be considered across a company, from its vision, mission and culture. Thus, it is important for a brand's health to be existent within the business and externally in order to add value to the lives of all its stakeholders (Averntaplin, 2015).

Woolworths' vision of becoming, "One of the world's most responsible retailers," reflects eco-consciousness and its passion towards doing good for its customers, its people and the planet (Woolworths Holdings Limited, 2020).

A Healthy Brand Is Transparent

Being transparent about a brand's actions and procedures increases consumer trust. It is therefore important for a brand to be open and socially responsible, maintaining a relationship with its community of customers through ongoing dialogue (Averntaplin, 2015). The annual Woolworths Good Business Journey Report, written by the brand's own Sustainability Committee and made publicly available, covers Woolworths' strategies and progress in light of its sustainability objectives (Woolworths Holdings Limited, 2019). These objectives cover:

Social Development - Aiming to contribute R3.5billion to communities by 2020.

Health & Wellness - Ensuring a safe environment for its employees across all operations and inspire customers to make healthy eating choices by providing a wide variety of healthy food options.

Sustainable Farming - Active management of environmental impact and preserving the dignity of animals in the supply chain.

Ethical Sourcing - Creating better lives for the workers involved in the brand's supply chain.

Waste - Reduction of the amount of waste sent to landfill and using recycled materials in operations.

Water & Energy - To save 500billion litres of water by the end of 2020, and halve total energy consumption.

Woolworths vision for adding value to peoples lives doesn't only exist as ostentatious wording, but in actions through its many initiatives that prioritises food waste management, sustainability and community. By making its progress towards these

goals public, the brand shows a commitment to the greater community, and willingness to be held accountable for its values and aims (Woolworths Holdings Limited, 2019).

A Healthy Brand Builds Sustainable Relationships - Never Taking More Than It Gives

"Sustainability requires that any brand is to meet the needs of the present and in doing this, not compromising any future generations in any form" (Averntaplin, 2015).

Woolworths works to improve traceability through their supply chain and responsible sourcing of fresh produce. This is done by working in collaboration with accredited industry partners and NGOs, such as the Worldwide Fund for Nature. The brand also works directly with farms and suppliers to ensure sustainable farming practices that encourage healthy soil, reduce the use of harmful synthetic chemicals, as well as natural resources. Personalised enhancement programmes are provided to farmers, designed to help them improve performances based on their needs. This in turn helps Woolworths towards the brand's greater sustainability objectives. These efforts are made without additional costs to consumers, showing an understanding of building sustainable relationships, a clear duty to giving back to South Africa's people, and consideration for the wellbeing of the country's future (Woolworths Holdings Limited, 2020).

1.5 Problem Statement

Evaluated against the Vega Healthy Brands Criteria Woolworths can be considered a sustainable brand that continues to demonstrate commitment to food waste management (Averntaplin, 2015). However, there is room for continued improvement and innovation within the brand. Research gaps identified in the literature review section exhibit contradictions in data findings and insights globally (World Wide Fund for Nature, 2017). These contradictions make comparable data for benchmarking, cross-referencing and gaining further insight very difficult. This reaffirms the need for research on the topic with South African context to provide relevant and practical insights for local application (World Wide Fund for Nature, 2017). Few studies have used comparative analysis to identify best practice approaches and make recommendations to the Woolworths brand. Based on the foundation of critical realism, the research conducted is driven by the objective of emancipation, seeking to address the political, social and economic problems that drive conflict, struggle, and inequality (Kivunja and

Kuyini, 2017). As such, research into pockets of excellence may indicate that more can be done to both innovate Woolworths' food waste management practices, and improve food waste management in South Africa's food retail sector as a whole - aiding in the emancipation of South African's enduring chronic food insecurity. The related research questions developed should define the broad objectives of the study. Aiming to solve the above problem, consideration should be given to Woolworth's current food waste management challenges, how Woolworths can possibly learn from other brands, and the implications of the Covid-19 pandemic on their practice.

2. Research Goal & Questions

Reflective of the study's research problem, the following research questions seek to address how Woolworths can improve its food waste management by learning from the policies and procedures of other organisations, identifying best practices that are applicable to the brand within local context and understanding the effects of Covid-19. Knowing the classification of research questions developed can help guide a researcher in identifying the appropriate research and methodology required (Bezuidenhout & Davis, 2014), thus the questions listed below are defined as exploratory questions. Qualitative research (described in further detail in the Research Methodology section) will be used to collect the data from both primary and secondary sources with the objective of answering the following:

Research Question 1

How can Woolworths improve its food waste management practices?

- *What are Woolworths' main causes of food waste within its food chain?*
- *What practical and effective management practices can Woolworths learn from other food retailers in order to become more sustainable?*
- *How can Woolworths aid other food sectors in the improvement of their food waste management practices and policies?*

Research Question 2

How has the Covid-19 virus impacted Woolworths' food waste management practices?

- *How has the Covid-19 virus affected consumer behaviour?*
- *How has the Covid-19 virus and related government intervention impacted food production and delivery?*
- *How has the Covid-19 virus influenced hygiene and food selection policies?*
- *What are the moral considerations for food retailers who experience panic buying in times of crisis?*

3. Literature review

Amongst the 10 million tonnes of food wasted yearly in South Africa, cereal, fruits, and vegetables make up 70% of the total (World Wide Fund for Nature, 2017). The financial implications of food loss in South Africa according to the Council for Scientific and Industrial Research is R61.5 billion per year. Further, the estimated cost of wasted energy is R1 billion per year. The impact of such large figures on the economy cannot be understated, with the amount of energy wasted approximately equivalent to powering the City of Johannesburg for up to 16 weeks (World Wide Fund for Nature, 2017).

The prevalent cause of food waste amongst consumers is overcooking and unconsumed surplus foods. By over-purchasing consumers waste food that could otherwise be used to feed the less fortunate. However, the Food Loss & Waste report by the World Wide Fund for Nature (2017) shows that consumers only play a small part of the overall issue, contributing to 5% of total food waste in South Africa. This greatly highlights the need for South Africa's agricultural, processing, packaging, and retail sectors to improve their food waste management practices - as these sectors are collectively responsible for the remaining 95% of food waste in the country (World Wide Fund for Nature, 2017).

As one of the largest retailers in South Africa, Woolworths falls within a major contributing sector, and thus bares a great responsibility. Amongst the greatest causes for food waste within the retail sector, the lack of legislation covering food waste management allows retailers to act as they see fit. This has led to supermarkets creating their own policies and others doing without. Amongst the retailers that have food waste

management policies, fresh produce that might fail to meet aesthetic expectations (due to being damaged during packaging or transport) are used in salads and pastries. There are also opportunities for local supermarkets to give out unused food to those in need. However, the logistics of handing out food on site presents a complicated challenge that's met with reluctance amongst many retailers (Reddy, 2020).

Despite surplus food still being edible and safe for human consumption, it remains often handled as waste, rather than removed from sale within traditional channels, and redistributed (World Wide Fund for Nature, 2018). Woolworths has partnered with Food Forward South Africa, a non-profit organisation (NPO) dedicated to increasing access to food across South Africa. Their partnership, formed in 2018, established the commitment to donating R3 million over the course of three years, by helping the brand's capacity to re-distribute the edible surplus food Woolworths collects from producers, manufacturers, wholesalers and retailers. Food Forward then uses their vast network of NPOs to provide this excess food to those in need. This effort allows Food Forward to deliver 1.2 million meals per year (Bizcommunity, 2018).

Ambiguous food labels in South Africa also play a role in food waste. Many consumers experience confusion between date markings on food products and their meaning, resulting in food being discarded prematurely. The confusion arises due to significant crossover between which market segment a label is intended for. The 'best-before date' found on food products, directed at suppliers & retailers, define the suggested date before which the full quality of the product, as marketed, can be enjoyed. This label gives indication of general stock life and quality, and not expiration. The 'sell-by date' defines a product's shelf life in-store, detailing the recommended time in which it should be sold to retain the marketed quality. This is directed at retailers, communicating by when the supplier would like the product to be removed from the shelves. After this date, there still remains a reasonable storage period time at home. Lastly, the 'use-by/expiry date' defines the date after which food will perish, no longer retaining the marketed quality. This label is directed at consumers. It is illegal for retailers to sell foods after this expiry date. Retailers however, can aid in reducing confusion by educating its customers, providing in-store signs that communicate the difference in labels and their intended meaning. Making it easier for shoppers to understand and keep in mind after groceries are brought home (Business Tech, 2018).

In total, Woolworths donate food to over 1 500 local charities and shelters daily. In 2018, the brand donated over R500 million worth of Woolworths food products. The donations were products that had not been sold before their 'sell-by date' but were still within the 'use-by date' (Business Tech, 2018). In 2019 the brand bettered its commitment to Food Forward South Africa through its 'One Small Spoon Christmas' initiative, which helped donate an additional 2.5 million meals. The creation of the 'One Small Spoon Christmas' product line funded one meal per purchase, products were visibly labeled with the campaign logo for consumers, and customers were also able to support the initiative by making Food Forward one of their 'MySchool, MyVillage, MyPlanet' beneficiaries (Langson, 2019).

3.1 The Attitude of South African Consumers Towards Food Waste

Amongst the existent research conducted, with aims of defining the attitudes & behaviours of South African consumers towards food waste, studies showed racial bias. An exploratory cross-sectional survey conducted in 2018 within the Kimberley area by Cronje, van der Merwe and Muller however used stratified sampling that better represented the racial composition of the South African population.

A total of 100 surveys were given out with focus on the amount of food waste generated by the participating households, drivers of this waste, and whether they were aware of any basic preventative measures that could be taken. Results showed that 70% of the respondents did not plan their weekly meals, and amongst the remaining 30% that did so, only 54% kept to their meal planning. Effective meal planning significantly aids in the reduction of food waste as a schedule can help guide consumers when grocery shopping, avoiding excess purchases. Over half (52%) believed they purchased in excess of what their household needed. Identified drivers for buying more than necessary were incomplete grocery lists, goods on sale/specials (68%), and impulse purchasing (15%) (Cronjé, van der Merwe & Müller, 2018).

Despite most of the respondents viewing food waste management as responsible, lack of knowledge as to how to better manage waste negatively influences consumers ability to follow through. 43% of all respondents expressed a great dislike for discarding food. Despite this, amongst the consumers who prepared more food than needed, 61% of the respondents still answered that the left-over food was discarded. These results

suggest a strong need amongst South Africans for basic education on food waste prevention measures, and development of their understanding as to how poor food waste management affects the country as a whole (Cronjé et al. 2018).

3.2 Research Gaps

On observation, the existent research conducted on food waste and food waste management globally show contradictions in data findings and insights. Differences in food waste patterns are evident between the developing and the developed world. In developing countries most food loss can be found in the initial stages of the food value chain (agriculture, post-harvest, processing and packaging). In industrialised and developed nations, food loss occurs in majority in the final stages (retailers and consumers). Food waste in Europe and North America can be attributed to inefficient planning and careless consumption amongst retailers and consumers. However, studies in Africa and Asia have found that food loss is primarily a consequence of poor infrastructure and financial constraints (World Wide Fund for Nature, 2017). This highlights the necessity for more of South Africa's own studies on food waste management in order to derive insight unique to South Africa's realities. Solutions, for the most part, cannot be implemented solely based on foreign research - greater context is required (World Wide Fund for Nature, 2017).

Additionally, sample sizes of research conducted are often small in number (100+/- participants), making it difficult to trust how accurately findings reflect behaviours across South Africa. There also may be inaccuracies in responses given by respondents asked to make estimates of food consumption practices and habits from memory. Further, the results of surveys conducted on the subject of food waste amongst consumers, retailers, restaurateurs, manufacturers, delivery service owners and even farmers have to be considered with the associated moral and judgmental implications. In other words, respondents may understate their wasteful habits for fear of judgment and negatively impacting their reputations. Thus, the accurate identification of causes of food waste along the food value chain is lacking.

This insufficient knowledge presents a challenge that the nation and its researchers can only begin to solve through collective action and reporting transparency. Without an increase in local studies conducted and transparency, it will continue to be difficult to diagnose weak points in South Africa's food industry and provide recommendations.

4. Research methodology

4.1 Research Design

The research methodology will employ a qualitative research approach. Qualitative research can be defined as a process of enquiry designed to gain comprehensive understanding of complex phenomena through the analysis of people, words, pictures and videos in the context in which they exist (Political Science, 2009). Food waste being a complex phenomenon of its own, the use of qualitative data collection methods will allow for a depth of data to be obtained on the matter. This will enable capturing detailed information on the experience of Woolworths staff overseeing food waste management, giving opportunity to understand the 'why', 'what' and 'how' of the brand's practice. As well as, provide opportunity to gain information that can further inform the brand (Strydom & Bezuidenhout, 2014).

4.2 Population

In order to best identify the appropriate population for the study, the research problem and research questions must be considered. Thereafter, the unit/s of analysis that can best answer the research questions are determined in order to define the population (Pascoe, 2014). To study how Woolworths can improve its food waste management practices, greater understanding of their current food waste management policies need to be gained. To identify best practices used by other food retailers globally and make recommendations to Woolworths, case studies & historical documents will also be analysed. This study's target population is defined as follows:

1. All Woolworths employees in South Africa in senior management positions within the brand's food retail stores.
2. All online global case studies & historical documents that delve into the analysis of food retailers who have implemented food waste management methods, systems and/or policies that have yielded positive material results.

However, as the above populations are large and widespread, a more accessible population must be identified. The accessible population comprises only the section of the population that can be reached and therefore included in the study (Pascoe, 2014). As such, of the Woolworths employees in senior management positions, the study will only focus on those within the brand's Gauteng based retail stores. Additionally, the online case studies and historical documents used in this research must have been published within the last 10 years to ensure the findings are relevant.

4.3 Sampling

The sampling process requires several considerations with regards to budget, time constraints, resources available, and the research's purpose. Aligning with the qualitative research approach, the proposed sampling method of choice is non-probability sampling. A definition of non-probability sampling is detailed below.

Non - probability sampling

The selection process of people and artefacts to be included in a sample, though still within a population's parameters, are based on the researcher's judgment and ability to reach participants. Findings are not obtained with the objective of using the results to make generalisations about the larger population (Pascoe, 2014). Rather, the sampling technique focuses on how many units are required in order to gain an in-depth understanding of the research problem (Pascoe, 2014). This technique also considers the feasibility and costs of research when access to an entire population may be too difficult and time consuming, as is the case with the identified accessible population.

Purposive Sampling is a non-probability sampling method that involves the deliberate selection of elements to be included in a sample based on a fixed list of characteristics. The characteristics to include are drawn from the defined research questions and population. Thereafter the researcher carefully selects from the population the units that share these characteristics forming the sample. This narrows the focus of the research, ensuring that each element included in the sample falls within the population parameters and contributes to the study (Pascoe, 2014).

Considering the purpose of this study, and the qualitative research design, purposive sampling techniques – namely: extreme case and critical case sampling – will be used to conduct the research. Purposive sampling's main objective focuses on specific characteristics of the population. It is time conscious, allows for access to valuable data and knowledge at a low cost, and aligns with qualitative research, making it strongly suited to resolving the study's research problem and questions (Pascoe, 2014).

Extreme case sampling is best used for cases that are unique or uncommon - such as the effects of the Covid-19 global pandemic on food waste - typically highlighting noteworthy outcomes, successes and failures (Laerd Dissertation, 2012). Thus, this style of purposive sampling is well suited to this study's objectives (Laerd Dissertation, 2012). Critical case sampling is particularly useful in research where a single or small number of cases is sufficient to form an understanding of a phenomenon of interest. This is practical for research with limited resources available. Arguably, the technique can aid in making careful logical generalisations about a population (as opposed to statistical generalisations) - which is useful in understanding how food waste management practices can be improved in South Africa's retail sector. Additionally, as a brand that offers standardised in-store experiences, services and products, one can arguably assume that a set of Woolworths food waste management policies are practiced by all stores.

As such, the study's sample size is defined as:

1. Two senior managers who oversee food waste management within Woolworths' retail stores based in Gauteng.

2. Three online global case studies and/or historical documents that delve into the analysis of food retailers who have implemented food waste management methods, systems and/or policies that have yielded positive material results.

4.4 Data Collection Methods

Both major qualitative data collection categories, namely non-reactive research and field research are used for the purpose of this study. Field research approaches aim to observe, interact and understand a targeted population in its natural environment - using interviews, limited participation, and analysis of documents, amongst other methods (Bezuidenhout & Cronje, 2014). As opposed to Positivist research, cause and effect variables are not solely sought after in qualitative research. Data collection is instead mostly based on finding correlations (Strydom & Bezuidenhout, 2014). Historical analysis is a form of non-reactive research that studies descriptions and analysis of past events. Historical research looks into identifying the consequences of actions, aiding with decision making and recommendations based on the outcomes. This research method is ideal for recording and evaluating the achievements and failures of individuals, organisations and countries, as well as identifying past patterns of behaviour (Strydom & Bezuidenhout, 2014). This serves the objective of understanding consumer behaviour and food waste during a crisis and provide comparative means for answering how Woolworths can become more sustainable. Secondary sources and records such as journal articles and reports have also been used as historical evidence.

A one-on-one semi-structured interview consisting of open-ended questions has been designed to gather primary data from managers at Woolworths food stores within Gauteng. This design allows for casual conversation where more in-depth insight and context of the experiences and challenges Woolworths face can be gained (Bezuidenhout & Cronje, 2014). A one-on-one interview also enables a researcher to ask participants to clarify statements made, provide more detailed explanations and creates overall greater flexibility in the data collection process (Strydom & Bezuidenhout, 2014).

Illustrative and explanatory cases on successful food waste management practices used globally will be analysed. An illustrative case study documents and presents real-life events by thoroughly describing the context in which a phenomenon occurred in attempt to understand the specific case. Explanatory case studies aim to define the specific

circumstances and nuances of a particular phenomenon (Strydom & Bezuidenhout, 2014). This form of enquiry offers a deeper exploration of applicable and practical methods that can be adopted by Woolworths, and ultimately, South Africa's food retail sector.

4.5 Data analysis Method

Thematic analysis with an inductive approach was initially determined for use in examining the qualitative data collected through interview. This involves a latent and iterative process of carefully analysing the data to identify common themes such as topics, patterns of meaning and ideas that are consistent throughout the text. The analysis follows a series of steps, namely: familiarisation; coding; generating themes, reviewing themes; defining and naming themes; and interpretation and substantiation (Caulfield, 2019).

Familiarisation involves giving a thorough overview of the total data collected before analysis, and coding refers to highlighting sections of the text - labelling (coding) these phrases/sentences to describe the content. Sections of the text that hold similarities are grouped through their attributed codes. This allows for a condensed overview of the major subjects and ideas that recur throughout the text. Thereafter, themes are generated by combining several codes into singular themes for analysis and interpretation (Caulfield, 2019).

However, results from the first interview confirmed the assumption that Woolworths' operations are standardised. The intention was to interview senior managers who oversee food waste management within Woolworths' retail stores based in Gauteng. Representatives in a management position would allow for a holistic view of the brand's food waste practices and general operations. Further reasoning for the selected amount of interviewees was availability - working for a large food retail brand such as Woolworths is presumably time consuming. Moreover, the brand is most likely contacted frequently for research purposes, making gaining an audience with their representatives difficult.

As such, based on confirmation of their standardised policies from the first Woolworths Food Departmental Manager interviewed, information given regarding operations from another store manager would be found redundant. Thus, a single interview with a Food

Departmental Manager was conducted - refer to Appendix A and C. As a result of these developments, a thematic analysis of the interview proved impractical due to lacking comparative data for assessing any emerging patterns. The interview's data is therefore presented as an additional case study from which information of use for addressing the study's research questions will be highlighted, analysed and interpreted below.

5. Analysis of data and findings

5.1 Analysis of Semi-structured Interviewa

According to the Food Departmental Manager manager interviewed - who will be kept anonymous throughout the discourse of this study - food waste management at Woolworths involves a process of checking and removing goods that have reached their sell by date from shelves at the end of each business day. These goods are then sold the following day to staff members. Any products left over after sale to staff are then donated to charities.

Woolworths main cause of food waste within its stores is the loss of cold chain, which refers to the speed of moving products from storage to fridges. Perishable foods, such as dairy and meat, that are not delivered to their designated fridges within eight minutes are written off as a loss and considered waste. This is due to reduction in quality and some of the items changing in colour. Products with damaged or dented packaging are also removed from store floors. These practices are illustrative of the brand's high aesthetic standards and how these standards can drive food waste.

Woolworths' suppliers deliver orders to their distribution centre, where stock goes through several checks, including temperature checks before being sent out to its stores. Perishable goods are placed in a cooling container during transportation. However, all goods are subject to the stock rotation system known as 'first in, first out'

(FIFO) to reduce food waste. FIFO is an inventory practice that sells products stocked first before offering the latest products stocked (Syroegina, 2016).

The manager confirms that the brand applies environmentally conscious practices through its Good Business Journey initiative, which focuses on a consistent approach to managing sustainability issues, such as ethical sourcing and recycling, across the brand's supply chain. Amongst targets for 2020 is the total phasing out of single-use plastic shopping bags, which was also concurred by the manager (Woolworths Holdings Limited, 2020).

The financial implications of wasted food is shared by both Woolworths and its suppliers depending on the cause. Losses incurred as a result of poor quality stock are taken on by suppliers, any packaging that is not properly secured during delivery by the Woolworths distribution centre is covered by Woolworths itself, and lastly waste in-store are considered known losses and also taken on by the brand.

In regards to consumer education on food waste management, the manger mentioned that attempts are made to communicate to customers the impact of waste - however no consistent methods of education and communication were mentioned. In fact, consumers often take advantage of Woolworths' refund policy by returning goods they have poorly stored themselves (eg. ice cream left to melt in their personal vehicles). Cases of dishonest consumers were also mentioned, where a customer regularly purchase items, partially consuming the contents, before returning them to the store and filing a complaint about the product - requesting a refund. Lacking consumer education channels on food waste points to a serious issue which indirectly encourages reckless consumption and poor food management behaviours. This is an issue that should be addressed and is discussed further in the study's recommendations.

In regards to the impact of the Covid-19 virus and lockdown restrictions introduced by the government, the manager explained that the pandemic resulted in consumers panic buying. However, interestingly enough the sudden spike in demand allowed the retailer to sell out its de-catalogued items which were left in storage, helping these products avoid going to waste. This information however points to a mismatch between supply and demand experienced by the brand. Further efforts were made by the brand in-store through banners to communicate that their stores will remain open as an essential service and that customers should avoid purchasing more than they need to. Policies

were also introduced that restricted shoppers to a limit of being able to purchase no more than five of the same items, considering how it affects others - an exemplar of the brands socially conscious values.

As a result of the changes in consumer behaviour, the brand has reduced its orders of long-life goods and increased perishable goods ordered from suppliers. This can be understood as a consequence of consumers initially focusing on purchasing long-life items at the beginning of South Africa's lockdown, reducing the need for these items over the course of the year. However, impressively the Covid-19 pandemic has had little material affect on the brand's food selection and hygiene practices beyond the use of hand sanitisers and the measuring of body temperatures before accessing stores. The manager communicated that the brand has always maintained high hygiene standards in how their foods are selected and handled, requiring the retailer to not make any changes to their supply process. In this regard, Woolworths hygiene practices can be considered an exemplary standard for other stakeholders of South Africa's food supply chain.

5.2 Analysis of case brands

The Food Sustainability Index is a global index developed by the Economist Intelligence Unit in collaboration with the Barilla Center for Food & Nutrition. The index evaluates countries on their efforts in addressing food loss and waste, ranking each country accordingly (Food Sustainability, 2020). According to the index Finland ranks within the top 10 countries in the world addressing food waste. Being a prime market for research, this study makes a case analysis of Finland's two leading retailers to determine whether there are any key differences in food waste reduction practices in comparison with Woolworths. Analysis conducted by researcher Anastasia Syroegina (2016) on Finnish retailers' roles in reducing food waste is primarily used as the foundation for the findings below.

S-group

The Finnish food retail industry is primarily dominated by the S-group which have 45.7% of the country's total market share. Finland in itself has a relatively small population of approximately 5.5 million people, however the S-group has over 1 000 stores in total - more than double the amount of Woolworths stores in South Africa. The

group also has its own food brands Rainbow, X-tra and Kotimaista, similar to Woolworths (Syroegina, 2016).

S-group values the wellbeing of employees, locally produced sustainable items, general transparency, and the responsible treatment of energy and waste. Amongst their objectives for sustainability are the reduction of food waste, improved recovery methods, and an increase in food donations. In 2015, the group interviewed several of its own stakeholders, asking participants to list the most important issues they believe the group should address within its responsibility programme. Based on the responses received, stakeholders found food waste management to be one of the highest priority objectives within the retailer's sustainability strategy (Syroegina, 2016).

Syroegina (Syroegina, 2016) conducted initial data collection on the S-group through analysis of materials available on their website and official related pages. Amongst these pages were annual sustainability reports, general articles on food waste and guidance given to consumers on how to manage food waste. In addition, a structured interview with the brand's Case Compliance manager was used for further information gathering. Results of the interview highlighted the brand's focus on maintaining a close relationship between demand forecasting, supplier collaboration and sustainable order management (Syroegina, 2016). The manager mentioned that demand estimates are communicated to farms and manufactures ahead of time, in fact the S-group communicates demand estimates as far as 10 months in advance. Mismatch between supply and demand are major drivers of food waste in retail, primarily impacting highly perishable products that require being stored and sold within a very limited time frame. Thus, accurate demand forecasting is key to reducing waste. Order management also plays its part, the S-group making use of alternate suppliers when one may fail to meet demand in time. Overall, collaboration with its suppliers helps the brand improve the efficiency of its operations (Syroegina, 2016).

According to Syroegina (2016) 80% of S-group's products are produced in Finland. However, the retailer is aiming to establish a shorter supply chain which will help minimise spoilage and result in fresher goods. Nevertheless, it is important to note that selection of suppliers can be based on a combination of factors for retailers, including price and delivery times, making local production not always the easiest route.

An IT system is used within each of the brand's stores which records food that is wasted in order to make calculated adjustments to demand estimates before placing orders.

The system is used in hand with routine reviewal of product sales, allowing for the assessment of items that are not popular and adjustment of order quantities, avoiding surplus stock. The FIFO stock rotation system is also used by the retailer to reduce food waste. Additionally, continuous feedback on packaging is given to manufactures in order to find a balance between reduction in materials used and the packaging's ability to preserve the product (Syroegina, 2016).

The S-group offer a variety of items sold in loose form, such as fruit, vegetables, meat, fish, candies, and nuts, which allows consumers the freedom to decide on the specific amount they may need. This differs to Woolworths stores which sell a very limited amount of loose form items (Syroegina, 2016). Another cause of food waste is the use of volume promotions by retailers (i.e. 'buy one, get two free'). Promotions of this kind encourage consumers to purchase surplus foods that they may otherwise not need. The promotions also cause food supply chain disruptions that drive inventory overages, and cannibalise the sales of other items, leading to slack inventory. The S-group generally avoid the use of these kind of promotions. The retailer instead offers price discounts on items reaching their expiration dates. 90% of the food that is not sold is re-used in one form or another, through initiatives of choice including donations, fuel recovery, energy recovery, animal feed and composting. In like manner to Woolworths, the S-group donates to approximately 200 food distributing charities. As a result of its food recovery efforts detailed in the S-group's sustainability report, the brand impressively does not send anything from its supply chain to landfills (Syroegina, 2016).

Lastly, the S-group shows strong commitment to consumer education, taking part in local third party campaigns such as Finland's 'Waste Week,' and offering information on the company's site on how to reduce food waste at home. Amongst the information provided, a breakdown for consumers of the different expiration labels and their meanings is also given. In addition, a variety of other channels are used to communicate food waste management practices to consumers, including websites managed by the chain, such as Yhteishyvä and Patarumpu (Syroegina, 2016).

Kesko

Kesko is the second largest grocery retailer in Finland with a market share of 33.1% and north of 920 stores in the country. Kesko operates a list of grocery outlets such as K-supermarket, K-market, and K-citymarket. Additionally, the brand offers a wholesale

service that sells food to catering companies, as well as its own branded food products Euro Shopper, Pirkka and K-menu (Syroegina, 2016). The company prioritises employee care, responsible production, offering consumers goods that support consumer wellbeing, and environmentally conscious practices. Amongst their annual sustainability report objectives (Kesko, 2020) are the reduction of the brand's food waste levels by 13% by 2021.

Similarly to the S-group, Kesko prioritises demand forecasting. However, it applies variance in the timing of orders in relation to their different product categories. Using a centralised automated ordering system that delivers goods from its central warehouse to K-stores, their program makes use of past sales data and trends to calculate future demand. Use of this program in addition to the retailer regularly communicating with its suppliers has minimised food waste and product shortages in stores, as staff are not required to make predictions and place orders themselves (Syroegina, 2016).

The products offered in stores are regularly revised based on consumer behaviour, with new items often being introduced and tested. If any products lose favour with customers they are offered on discount and swiftly taken out of selection thereafter. Products nearing expiration are also offered on discount to avoid waste. The retailer does not make use of volume promotions. Kesko also aims to encourage purchases of ready-made foods from their service counters as it allows customers to be specific about the amount of food they would like, limiting waste (Syroegina, 2016).

In regards to customer education, the brand offers a large amount of information on food waste management on its website. Articles provide tips on how to reduce waste at home, methods for decreasing food waste while shopping, and general information about food waste. Some of their stores also have food waste materials on display (Syroegina, 2016).

5.3 Findings & Recommendations

Large retail chains such as Woolworths possess significant market power - due to their direct links to farmers, processors and consumers. This unique position allows them the ability to influence several stakeholders that make up South Africa's food supply chain for better or worse. As a result, it is important that retailers are held to a very high standard in regards to their food waste policies - their willingness to collaborate with

other stakeholders being essential. The above cases give insight into some of the practices used by Finnish retailers that Woolworths could adopt, adding to their food waste management efforts.

Based on the information gained from the Woolworths' Food Departmental Manager's interview, the specific manageable challenges identified are:

1. Uncertainty regarding required stock quantities, resulting in a mismatch between demand and supply.
2. Lack of uses for aesthetically substandard foods.
3. Lack of food waste management education offered to consumers.

Further findings and recommendations covering these challenges are discussed below.

Pre-store and In-store

Woolworths' high aesthetic standards requires the retailer to categorise items that appear marginally substandard as waste. The items are then sold to staff or donated to charities. However, there are other unexplored opportunities for aesthetically substandard items. These products could be positioned and advertised for sale to environmentally conscious consumers at a discounted price (Syroegina, 2016). Furthermore, a section of an aisle or refrigerator case can be reserved for displaying these "upcycled" products to this emerging customer segment committed to recycling. The new product category would reduce the embedded costs in producing wasted food, creating an additional revenue stream for the brand.

Mismatch between demand and supply can result in waste for both Woolworths and its suppliers. Farmers who are uncertain of the amount of produce that may be ordered by Woolworths might overproduce stock that may ultimately go to waste, or fail to meet demand altogether. It is therefore important that Woolworths improves its demand forecasting. Similarly to both Kesko and S-group, a Collaborative Planning, Forecasting and Replenishment practice can be used by Woolworths, that shares electronically with suppliers how the retailer calculates demand (Syroegina, 2016). Using the electronic system, information provided by multiple stakeholders that form a part of Woolworths' supply chain, detailing data related to harvesting, production, inventory, shipments,

orders, etc. can be accessed to allow for collaborative demand forecasting - improving forecasting accuracy (Syroegina, 2016). This would aid in minimising Woolworths' inventory losses. An additional policy that can be adopted from the Finnish retailers is the reduction or end of quantity based discounts which encourage surplus buying.

Consumers

Woolworths' lack of co-ordinated efforts in consumer education is a missed opportunity. Consumer education on food waste management would help to popularise the topic, influencing consumer culture for the better and bring awareness to its true impact on South Africans (Syroegina, 2016). As mentioned, both Kesko and the S-group show a strong commitment to consumer education, offering information through several channels. In contrast, though some information on food waste can be found on the Woolworths official website and its Youtube channel, it is limited to statements, statistical information, and generally inconsistent.

Regular and practical guides on food waste management communicated to customers will help address wasteful consumer culture and the perceived disconnection between reckless consumption and consequences (Syroegina, 2016). Woolworths could alternatively run online and in-store campaigns that raise awareness amongst consumers, describing practical actions that consumers can take to minimise their food waste. Monthly complementary in-store magazines focused on food waste management could be introduced, marketing the suggested "upcycled" product category to the targeted segment, reaping tangible benefits. The magazine would provide guidance on food labelling, offer storing and freezing tips, and cover delicious meals that can be made from leftovers (Syroegina, 2016). Additionally, in-store posters can be used to help customers understand the differences in food labels and help keep waste prevention tips top of mind while consumers shop. Lastly, in-store competitions, as well as demonstrations of delicious meals that can be made from left overs can help drive engagement, shift harmful consumer perceptions, and encourage mindfulness.

Covid-19

Despite Woolworths displayed ability in handling the Covid-19 virus, the global pandemic has stressed the need for performing a deep review of food systems the world over. With the health crisis directly influencing lifestyle habits, changes in consumer

behaviour have driven greater food waste generation (Aldaco et al., 2020). Conversely, this strong disruption in consumer behaviour has also prompted an accelerated learning curve in food purchase management amongst people who cannot afford excessive recurrent purchases. This could arguably lead to a reduction in food waste generation in the long term amongst these consumers (Aldaco et al., 2020).

Naturally, food providers already familiar with digital tools prior to the Covid-19 pandemic have been better equipped during lockdown restrictions. This has allowed these providers, such as Woolworths, to effectively respond to an increase in online shopping demand during this period (Aldaco et al., 2020). The Covid-19 crisis has also revealed a huge need for the South African government to support the digitalisation of essential activities and decentralisation of the country's food supply chain. Primary sector workers who form a part of the early phases of food supply have been forced to dispose of large amounts of produce as a result of chain inflexibility and complex logistics. This is a reality that is juxtaposed by the millions of South Africans who continue to suffer from chronic food insecurity. By practicing responsible food waste management throughout the supply chain and the inclusion of smaller flexible producers in conjunction with larger farms, a more robust network of food delivery can be developed in South Africa that increases food security in communities across all socioeconomic classes (Aldaco et al., 2020).

6. Ethical Considerations, Limitations and Trustworthiness

6.1 Ethical considerations

The consideration of ethics is imperative to research as it potentially affects all stakeholders involved (participants, research communities, academic institutions, local communities of direct benefit, etc). As such, a list of ethical factors were considered prior to the study's implementation, regarding: the ethical implications of the proposed research methodology; informed consent; collecting data from participants; handling sensitive information; providing incentives; avoiding harm; dealing with confidentiality and anonymity; and lastly, avoiding deception (Louw, 2014). These ethical factors are discussed below.

In order to maintain the ethical integrity of the study, the research was conducted honestly, with any risks to participants minimised, and consent given by all participants in regards to their participation. The interviewed Woolworths manager was given clear communication as to what will be required of them, how the research findings will be used, and how their identities will be protected (Louw, 2014). This information was communicated in writing as a part of the interview designed for the study and was signed by the interviewee - see consent form attached. In regards to the data collection process, the interview guide designed was evaluated towards avoiding the use of any questions that may potentially embarrass participants, and consideration of the participants time was given. The interviewee was assured that any sensitive information

given in regards to the inner workings of the food retailer will be kept confidential as a matter of principle (Louw, 2014). No incentives, financial or otherwise, were used to encourage the participation of the interviewee, as this would be morally plausible and could influence bias in findings. Use of incentives may also hamper the sampling process.

In the context of social sciences, the concept of harm differs to that of natural sciences. For the latter, harm most often relates to any physical damage and should be avoided, however in context of qualitative research, avoiding harm can be more complex. To illustrate, 'harm' in the context of a qualitative study may relate to creating circumstances where an interviewee may be at risk of losing employment at Woolworths, or causing participants to recall traumatic experiences which may take an emotional toll on their state (Louw, 2014). As a result, considerable sensitivity was practiced during the data collection process. The nature of the study was communicated clearly in advance - prior to requesting signed consent from the participant. This ensured that the participant was aware of the kind of information that may likely be explored (Louw, 2014).

In the case of confidentiality and anonymity, the differences in these terms were clearly distinguished beforehand. As such, the participant expressed preference for anonymity. Participants' anonymity - which relates to names or any other identifying information - has therefore not been included throughout the research process (Louw, 2014). The interview designed also does not request any identifying details - see attached Appendix A. Finally, as the nature of the study did not require a degree of initial disinformation to yield honest responses and credible results, any acts of deception were considered exploitative and as such avoided entirely.

The remaining key factors considered relating to the ethical integrity of this study were that of the researcher's own approach. Factors such as falsifying information, the distortion of results, misuse of information and use of inappropriate research methods cannot be condoned (Louw, 2014). As researchers there is an ethical responsibility to protect participants from harm, and to conduct consistent reevaluation of the research process and methods employed for verification of validity, ethical integrity and neutrality (avoiding bias). In this respect, a personal ethical code of conduct was drafted for regular referral and followed throughout the study, to ensure the research process was grounded in ethical foundations - see attached Appendix B.

Without the confidence of participants in regards to a researcher's commitment to ethics, interviewees may feel uncomfortable and unsure of whether their subsequent behaviour shall be safeguarded from risks. This can result in the information obtained not being a true reflection of the interviewee's experience (Laerd Dissertation, 2012). Consequently, the above commitments were made to further reinforce the reliability and validity of the study. The process of undertaking ethical assessments regarding the actions, bias and research instruments used towards the collection of data for the purpose of this study align with the methodological strategy of procedural review for consistency of data. The greater the consistency in data, the greater its trustworthiness and reliability (Golafshani, 2003).

Ethics are the cornerstone of all research, and without ethical measures, the critical realist objective of emancipation is fundamentally compromised - thus the quality and potential contribution of this research study lost (Louw, 2014). Therefore, maintaining high standards of honesty, transparency, rigour and respect towards all participants throughout this study has been paramount.

6.2 Trustworthiness

The data collection methods used required partial participation, which necessitates a balance between a researcher's involvement with the target population's experience and enough distance to be able to maintain objectivity (Strydom & Bezuidenhout, 2014). This balanced degree of involvement aids with ensuring the trustworthiness of findings. Reviewing the quality of research is imperative to findings having potential for real world contributions - key to critical realism. To ensure the study's integrity, the reliability, validity and trustworthiness of the research has been thoroughly considered (Noble and Smith, 2015). However, statistical methods of determining reliability and validity are incompatible with qualitative research, therefore the concept of reliability and validity was redefined for their purpose in qualitative analysis (Golafshani, 2003).

In context of qualitative research, validity refers to the appropriateness of the tools, processes and data used, ensuring a 'golden thread' if you will, exists throughout the research. This 'golden thread' connects the elements of the research - the choice in research paradigm and the defined research problem, whether the research question is valid for the objective sought after, if the methodology of choice is appropriate for

solving the research questions, whether the research design is valid for the methodology, the appropriateness of the sampling and data analysis, and lastly, the validity of the results and findings for the sample and context (Leung, 2015). Transparency regarding these research logistics and alignment of each of these elements have therefore been reviewed at each stage. By doing so, the research process is validated and outcomes are assured of robustness and high rigour (Leung, 2015).

Qualitative research must employ methodological strategies to ensure the trustworthiness and reliability of results (Noble and Smith, 2015). Though it can be argued that reliability refers to measurements and therefore has no relevance in qualitative research, the concept in context of qualitative analysis can refer to the consistency of data. Consistency of data is achieved when each stage of research is examined for substantiation. In this sense, the congruence of reliability and validity in qualitative research can be argued, where exhibiting the latter [validity] ensures the former [reliability] (Golafshani, 2003). Additional strategies that have been made use of throughout the research process are, namely: regular comparison of accounts to identify similarities and differences, ensuring different perspectives are represented and/or supported for reliability; accounting for a researcher's personal biases which may sway findings; providing rich and comprehensive verbatim descriptions of participants' and sources accounts to support insights; and the use of data triangulation, which involves multiple methods of data collection, to aid in producing a more conclusive set of findings (Leung, 2015).

6.3 Limitations of the study

Clearly identified limitations and delimitations of a study aid in strengthening its validity and reliability within the scope of its research. Therefore, the impact of factors beyond a researcher's control, and the justification of decisions made in regards to the scope of research should be defined (Enslin, 2014).

As this research was not financially funded, budget limitations needed to be considered when deciding on the appropriate research methodologies, targeted population and research instruments used. For a study to be able to interview all Woolworths employees in South Africa in senior management positions that oversee food waste management within the brand's retail stores, the process would have required a large budget for funding research teams and covering the cost of transportation across South Africa. The

use of alternative means, such as telephonic interviews, would have still required substantial financial support for covering the research teams employed and purchased airtime. As such, financial limitations required the scope of the study to be redefined to Woolworths employees in Gauteng in senior management positions that oversee food waste management within the brand's retail stores.

In regards to accessibility and time related limitations, the greatest posed threat to the research process was the impact of Covid-19 on civilian movement and workforce schedules. The virus' impact and government interventions discouraging social interaction needed to be considered in relation to how they could affect the interviewing process. Further, the consideration of availability of managerial staff to interview during this time needed to be taken into account. Thus, these challenges were given thought in determining the sample size selected and feasibility relative to the availability of one researcher. This arguably brings into question whether the research overlooked data saturation (Enslin, 2014). Conversely, the targeted population and methodologies were selected with consideration of this potential drawback. As a standardised brand, a set of Woolworths food waste management policies are practiced by all its stores. As such, interviewing one senior Food Departmental manager was found to be sufficient in providing an overview of the brand's processes in Gauteng. Furthermore, studying historical documents and case studies that delve into the analysis of food retailers who have successfully implemented food waste management methods, systems and/or policies, allowed for an expanse of information to be made available through online means - creating greater ease of access. Finally, purposive sampling and its critical case sampling technique is particularly useful in research where a single or small number of cases is enough to form an understanding of a phenomenon of interest - being both time conscious and practical for the research limitations (Laerd Dissertation, 2012).

The research proposed is decidedly specific in its use of the critical realist research paradigm. Though positivism and interpretivism each hold their own respective strengths, the research topic of food waste management has implications that go beyond finding causal relationships and interpreting meanings in human behaviour. The effect of food waste has political, social and economic relevance that drives struggle and inequality. As such, the critical realist lens was chosen as most appropriate for the study as it seeks to address oppressive structures (Kivunja and Kuyini, 2017).

6.4 Contributions of the study

This research aids in drawing attention to the true implications of food waste in South Africa. The study also contributes to filling the gap in literature with needed contextualised insight that can help in the improvement of food waste management. Furthermore, the study provides other researchers with a foundation to build subsequent local studies. The research results have aided in identifying areas of opportunity in the Woolworths brand for further innovation, with practical recommendations made that can be used by the brand and other local retailers. The Covid-19 pandemic has also created an urgent need for information on human behaviours during crisis, how this may relate to food waste, and how governments and retailers can defend against this. As such, the study has provided introductory means for understanding the challenges to addressing food waste during a pandemic, and can be used as a reference for developing future preventative measures. Fundamentally, the sweeping impact of food waste offers a unique opportunity for this research report to further aid multiple fields in environmental, socio-political and economic sectors. Ultimately supporting the greater objective of feeding the 13 million South Africans who routinely endure hunger.

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