THE SOUTH AFRICAN BREAD MARKET AND CONSUMERS' WILLINGNESS TO ADOPT MORE SUSTAINABLE OPTIONS

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Dissertation submitted in partial fulfilment of the requirements for the degree of Master of Consumer Science: Food Management

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Declaration

I, **Taryn Kotze**, hereby declare that this dissertation for the Master in Consumer Science: Food Management at the University of Pretoria, hereby submitted by me, is my own work and has not been previously submitted for a degree at this or any other university or tertiary institution. All reference material contained herein has been acknowledged according to the University's requirements and guidelines.

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Summary

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Wheat based bread products are a staple in many countries around the world including South Africa (Muzivi & Sunmola, 2021). This is becoming a concern as wheat, from an African perspective presents a two-fold problem. On the one hand regular wheat-based options (which are popular amongst consumers in South Africa), may lead to non-communicable diseases which is indicated to be unconducive towards consumer health. On the other hand, South Africa is a drought prone country and wheat relies heavily on water (Valizadeh, Ziaei & Mazloumzadeh, 2014). Finding innovative solutions or products to bridge this problem is not a simple task, as introducing more sustainable options tend to gain slow traction amongst consumers. To date very little is known about why

consumers fail to engage with alternative bread products. This study therefore anticipated to produce empirical evidence of aspects relating to consumers' preferences and prioritisation of product related attributes when considering bread options.

In order to meet the objectives formulated for this study a two phased methodological approach was followed. To commence a Market Quick Scan was used to provide a snapshot of the South African bread market. Results from this phase revealed that most retailers are well stocked in terms of assortment although it was noted that stores still mostly offered regular wheat options with limited alternative grain options. It was observed that prominent trends on the market were related to convenience, pleasure and health, where health options are becoming increasingly prominent on the shelves.

To gain insight about consumers' preferences and prioritisation, a structured, self-administrated electronic questionnaire was called for. Quantitative data was collected from the respondents regarding consumer preferences, actual consumption, prioritisation of product attributes and willingness to adopt alternative bread options. Findings from this phase confirmed that currently alternative bread options (that could be deemed as more sustainable when compared to wheat) are not frequently purchased by the sample. However, in terms of consumers' preferences and willingness to buy, results indicate that respondents show a high interest and would prefer to buy these products. These results are interpreted as a positive indication that there is a definite scope to introduce these alternatives to the market. In terms of particular product attributes, this study presented that overall, respondents tend to prioritise intrinsic over extrinsic attributes when selecting bread products. Product attributes pertaining to food safety and packaging were indicated as essential attributes to consider when trying to launch or position new products in this current market. This was an interesting point to note as previous studies highlighted the importance of taste and aroma. A possible reason for this could have been the ongoing impact of the COVID-19 pandemic which caused a heightened sense for food safety amongst consumers.

Key recommendations from this study concluded that there is definite appetite for alternative bread products but that these options need to comply / reflect specific product characteristics in order to be successful amongst consumers. It is essential that these alternative bread products are made available and easily accessible to consumers at an

affordable price. It is essential that producers and retailers include an aspect of familiarity to persuade consumers to purchase and consume these alternative bread products.

Dedication

Dedication to my mother, sister and partner.

I would like to thank my mother (Debra Kotze) for your endless support and belief in my abilities. You have always been my number one supporter in everything I do, and I will be forever grateful for you. You have made countless sacrifices for me and you have given me so much. Throughout the duration of this study, whenever I faced a challenge, you were the first person I could turn to, and you always knew exactly what to say to keep me going. I thank you from the bottom of my heart.

Sister (Nadene Kotze), thank you for leading by example and teaching me that success has no limit. You have taught me to always reach for the stars and always stay true to myself. The bond we have can never be broken, thank you.

I would like to thank my partner (Jason Dominy) for being my rock. Thank you for the endless encouragement, wisdom and stability you have provided during this dream of mine.

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Chapter 1

INTRODUCTION

This chapter contains the background of the research, the problem statement and the justification is made. A brief overview of the research is given, along with the aims and objectives of the study.

1.1 INTRODUCTION

Throughout the world, bread is an important staple food (Emami & Sobhani, 2020). Bread is considered to be simple, practical and straightforward to consume (Nugroho, 2019). Along with practicality, some bread products contain a wide range of nutritional components which are important to the overall health of human beings (Gellynck, Kühne, Van Bockstaele, Van de Walle & Dewettinck, 2009). Although bread can be presented in many nutritional forms, modern consumers have unfortunately become increasingly dependent on wheat-based products, in particularly refined wheat products due to numerous factors such as globalisation[1], modernisation[2] and urbanisation[3] (Mason, Jayne & Shiferaw, 2012). These factors not only drive market trends but also influence customers to select and consume bread products which are conveniently available and accessible instead of more nutritious, sustainable and/or innovative options. Bakke and Vickers (2007) postulates that reasons why more sustainable options (designed through innovation) are viewed as less desirable and thus not consumed is mainly due to unfamiliarity but also because it fails in matching the intrinsic and extrinsic attributes of "traditional" wheat-based bread products. Tradition and innovation are generally considered antonyms making innovation of traditional foods such as bread very challenging (Lipan, Sánchez-Rodríguez, Cano-Lamadrid, Collado-González, Noguera-Artiaga, Sendra & Carbonell-Barrachina, 2017). In terms of modernisation, technology

[1] Globalization refers to an wide network of economic, cultural, social and political interconnections and various processes which goes beyond the worlds' national boundaries Yalcin, B. 2018. What is globalisation?

[2] Modernization theory is the multidimensional development and study of the process of social evolution and in end the development of societies Goorha, P. 2010. Modernization Theory.

[3] Urbanisation refers to the population shift from **rural** to **urban areas**, the decrease in the proportion of people living in **rural area**s, and the ways in which societies adapt to this change Shukla, P., Chaurasia, M. & Singh, N. Transmutation of Urbanisation.

and activities such as mass production and convenience is dictating the type of foods that are available and consumed by consumers world-wide (Hayward, 2016). These factors have also become the basis of modern consumer lifestyles and as a result, threaten the sustainability of not only the natural[4] but also the social[5] environment (Reisch, Eberle & Lorek, 2013). Due to the intensity in terms of time and effort, commitment to a more sustainable lifestyle is seldom an option and as a result there has been a major soar in demand and sales of convenience food such as refined wheat based products (Ferreira, Marx-Pienaar & Sonnenberg, 2016).

From a South African perspective this situation is one of great concern as studies have shown that wheat-based bread products are considered as an essential item in South African Urban consumers' shopping baskets (Noort, Renzetti, Linderhof, du Rand, Marx-Pienaar, de Kock, Magano & Taylor, 2022). Currently statistics indicate that 63% of South Africans are already urbanised with future forecasts for 2030 set at 71%. Kuddus, Tynan and McBryde (2020) confirmed that urbanisation has long been associated with human development and progress, but recent studies have shown that urban settings also lead to significant inequalities and various health problems (Kuddus *et al.*, 2020; Mendez & Popkin, 2004; Oliveira, Ares & Deliza, 2017). In a country such as South Africa, the rapid rate of urbanisation coupled with modern-lifestyles and the associated diets (i.e., consumers' preference for wheat-based bread products) are therefore not only contributing to rising figures of malnutrition but also putting an immense strain on a country that is already deemed as arid. Turning a blind eye about this problem is no longer an option.

This study therefore proposed not only the revision of current bread products available to consumers in South Africa, but also the assessment of consumers' willingness to adopt and consume more sustainable bread alternatives (i.e., option that includes climate smart crops and or alternative / innovative production processes).

[4] Globally the consumption of refined wheat-based bread products (which consist of gluten instead of beneficial traditional grains) are leading to numerous issues relating to human health Gaesser, G. 2019. Perspective: Refined Grains and Health: Genuine Risk, or Guilt by Association? *Advances in Nutrition,* 10.

[5] Similar to numerous other convenient food products, wheat based bread products can often be highly processed leading to diets that are less healthy amongst consumers. Khonje, M.G. & Qaim, M. 2019. Modernization of African food retailing and (un) healthy food consumption. *Sustainability,* 11(16):4306.

1.2 PROBLEM STATEMENT

Urbanisation is generally adopted as a process that involves the shift in population from rural to urban settlements (McGranahan & Satterthwaite, 2014). Along with urbanisation comes the adoption of modern-day lifestyles and diets, where refined wheat-based bread products often feature as the number one convenient staple. Herein lies a twofold problem. Firstly, recent research noted that wheat-based bread products, which has been labelled as the most significant single crop in terms of human consumption, might be in trouble due to its heavy reliance on water which is greatly threatened by climatic change. Secondly that consumers' consumption of wheat in particularly refined wheat-based bread products does very little in terms of proper nutrition, health and one's wellbeing.

When reviewing the situation in South Africa, turning a blind eye with regard to this problem is no longer an option. South Africa is not only deemed as an arid country but is experiencing a rapid rate of urbanisation where vulnerable consumers who search for better lifestyles, fall victim to malnutrition. The shift from healthier, more sustainable grain options such as cassava and sorghum are replaced by cheaper more convenient available wheat, often in the form of refined wheat bread products. It is therefore not unreasonable to propose the revision of current bread alternatives in South Africa to address areas of concern by not only amending the current bread options or lines available in South African retail stores, but also assessing the need for more sustainable and or innovative traditional bread alternatives.

The aim of this study was therefore firstly to explore the current availability of bread products in the South African market, and secondly to identify and describe consumers actual / current but also future engagement with bread products in market. Consumers engagement was assessed in terms of current purchasing and preferences followed by the prioritisation of product attributes and possible willingness to adopt or purchase bread alternatives that present more sustainable characteristics. The hope was that results would pinpoint not only which bread products consumers currently consume but identify which important characteristics and product related attributes are prioritised and preferred when shopping for bread products. It is anticipated that results from this study could aid in possible re-shaping our current South African food environment in terms of future bread options which would be beneficial in terms of our natural and social environment.

1.3 JUSTIFICATION OF THE STUDY

Identifying more sustainable and innovative bread options has become a matter of great urgency. Many governmental and academic agenda's highlight the strain that wheat-based bread production and consumption is putting on natural and social environments globally (Shewry, 2009). The purpose of this study is to explore the current availability of bread products in South Africa, and to identify and describe consumer preferences and the willingness to adopt and consume non-traditional bread alternatives (breads produces from climate smart crops / alternative grains) that could be deemed more sustainable. This study aimed at identifying if there is a need for these bread alternatives amongst South Africans - in particularly Gauteng consumers and whether or not they are willing to adopt and consume these products. The hope was that results would pinpoint not only which bread products consumers currently consume but identify which important characteristics and product related attributes are prioritised and preferred when shopping for bread products. It is anticipated that results from this study could aid in possible re-shaping our current South African food environment in terms of future bread options which would be beneficial in terms of our natural and social environment.

1.3.1 Theoretical and practical contributions

The theoretical contribution of this research lies in providing current (up to date) empirical data regarding consumers' decision making, preferences and willingness to replace the traditional/ well known wheat-based "government-loaf" with alternatives that present attributes that could be viewed as non-traditional and possibly more sustainable. Historically, consumers' behaviour when buying bread was summarized as habitual which presented a relatively stable market environment. However, a growing awareness amongst consumers about sustainability and health requires a revision of "traditional" bread making and product availability. Unfortunately, information regarding the South African bread market and consumers' behaviour in this market tends to be limited. It is therefore believed that this study could fill this gap by not only investigating the matter at hand but by also identifying possible market opportunities to launch new/ alternative bread options. With that said, this study's practical contribution is considered quite significant as it could aid industry role players in improving the options within the bread category. This may benefit both the end consumer and other value chain actors (Tripathi *et al*., 2018; Hossain, 2017).

This study highlights not only the need for industry role-players to understand their target market's shopping behaviour but also the important role that industry plays in influencing and maintaining consumer food choice and overall societal health.

This study utilised elements of the Rapid Market Appraisal (RMA) for agricultural products and made use of a Market Quick Scan (MQS) which was used to explore the availability of bread products on the South African market. Additionally, the MQS aided the design of the consumer survey (as trends were identified through this process). Various steps of the RMA were utilised in this study to discover the current availability of bread products on the South African market. The steps implemented in this study provided an up-to-the-moment snapshot of bread products within the South African market. An RMA was used as a guideline to provide information on the availability and possible potential growth of the South African bread market with regard to sustainable bread products. An understanding of market opportunities within the bread market are outlined by making use of the RMA and the collection and analysis of relevant data were analysed to improve decision making. The MQS focused on identifying factors such as consumer trends which were made visible through in-store and online observations.

1.3.2 Social and environmental contributions

Urbanisation has impacted rural and urban communities in South Africa. Traditional lifestyles have been replaced with modern ones which is concerning with regard to the sustainability of our social environment. Modern consumption patterns rely on wheat-based bread products. The overconsumption of these wheat-based food products containing refined white flour instead of wholemeal flour or climate smart crop flour may contribute to an increase in chronic diseases (Hazard, Trafford, Lovegrove, Griffiths, Uauy & Shewry, 2020). According to Pena (2007) and the World Health Organisation (WHO) eating an excessive amount of poor quality wheat, may unfortunately have a negative impact on human health. This study will aid in pinpointing the product attributes that consumers are looking for in bread products, which gives industry role players an indication of which attributes are needed to entice consumers to purchase non-traditional, healthier and possibly more sustainable bread products.

In terms of environmental impacts, limited water resources in South Africa makes the consumption of wheat-based bread products unsustainable. Wheat is a crop that is

dependent on rain-fed conditions (Mwadzingeni, Shimelis, Tesfay & Tsilo, 2016). The climatic implications currently being experienced by South Africa is putting a strain on the natural environment therefore sustainable bread alternatives need to be identified. It is proposed that the production and ultimate consumption of "non-traditional" bread options that include alternative grains such as sorghum for example will ease the impacts made on not only the natural environment as they are indigenous to South Africa and highly resilient to numerous agro-ecological conditions but also aid in limiting consumers' vulnerability in terms of NCD's associated with refined-wheat bread options (Adepoju & Oyewole, 2013).

1.4 RESEARCH AIMS AND OBJECTIVES

This study firstly aims to explore the current availability of bread products on the South African market and secondly to identify and describe South African consumers' preferences and possible willingness to purchase more sustainable bread options (i.e., gluten-free flatbreads). The objectives of the study are as follows:

Objective 1: *To explore and describe the current South African bread market*

- Objective 1.1: To explore and describe which type of bread products are currently available to urban South African consumers.
- Objective 1.2: To explore current market and consumer trends that drive consumer's bread selection.

Objective 2: *To explore and describe consumers' current purchasing behaviour and preferences pertaining to bread products*

- Objective 2.1: To explore and describe consumers' current purchasing practices (i.e., categories, assortment, brand, patronage of retailers and number of servings) in terms of current available bread options.
- Objective 2.2: To explore and describe consumers' preferences (i.e., categories, assortment, brand, patronage of retailers and number of servings) in terms of products.
- Objective 2.3: To explore and describe consumers' prioritisation of selected intrinsic (characteristics such as taste, visual appearance, texture, flavour/aroma,

food safety, nutritional value, processing/ production technique and ingredients) and extrinsic (store image, price, brand, packaging and label) product attributes.

Objective 3: *To identify possible market opportunities for alternative bread options*.

- Objective 3.1: To explore urban South African consumers' willingness to purchase non-traditional/ innovative bread alternatives that could be deemed more sustainable.

1.5 CONCEPTUAL FRAMEWORK

A conceptual framework identifies the variables required in a research study and represents the researcher's synthesis of the literature in order to explain the phenomenon (Regoniel, 2015). It aids the researcher by making use of the particular variables in order to pursue the investigation and map out the problem at hand (Regoniel, 2015). The conceptual framework for this study is demonstrated below:

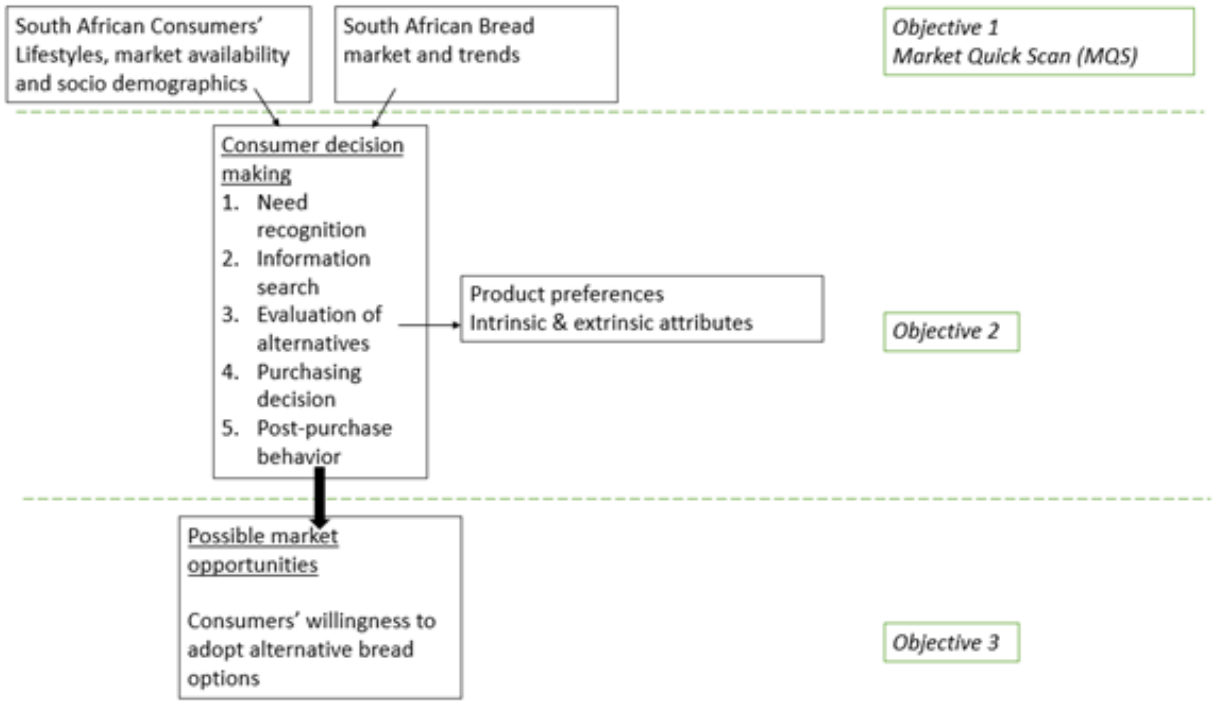

FIGURE 1.1: CONCEPTUAL FRAMEWORK

Figure 1.1, proposes that consumers' selection/ purchasing and ultimate willingness to adopt alternative bread options are highly dependant on situational factors such as market availability, consumer lifestyles, demographics and a consequential process of

decision making. Ronquest-Ross, Vink and Sigge (2015) highlighted that consumers food choices change due to numerous factors such as a larger variety of food products and better food options available to consumers. Food availability, accessibility and choice impacts food consumption (Ronquest-Ross *et al.*, 2015).

To address the main aim of this study i.e., consumers' willingness to adopt alternative bread options, it is of essence to first and foremost gain insight into the current bread market that includes product availability and consumer trends (Objective 1). These aspects are deemed highly influential in terms of consumer's decision making where consumers prioritisation of product attributes (i.e., intrinsic and extrinsic) during evaluation of alternatives requires attention (Objective 2). In conclusion this will allow for the identification and description of not only current product preferences but also possible market opportunities i.e., consumers' willingness to adopt alternative bread options (Objective 3).

1.6 STUDY AREA

The study was conducted in the geographic location of Gauteng province in South Africa. Currently Gauteng has an estimated population size of 15,5 million residents, which is estimated to be 26% of the total population of South Africa (Stats SA, 2022). The reason for choosing Gauteng was because firstly this area presents an excellent representation of all the key retailers that could be included to assess current market trends and bread availability during phase one. Secondly it is considered to be one of the most rapidly expanding provinces in terms of urbanisation (Nhamo, Rwizi, Mpandeli, Botai, Magidi, Tazvinga, Sobratee, Liphadzi, Naidoo & Modi, 2021). It can therefore be assumed that Gauteng would offer a respondent pool that fits the criteria set for the study.

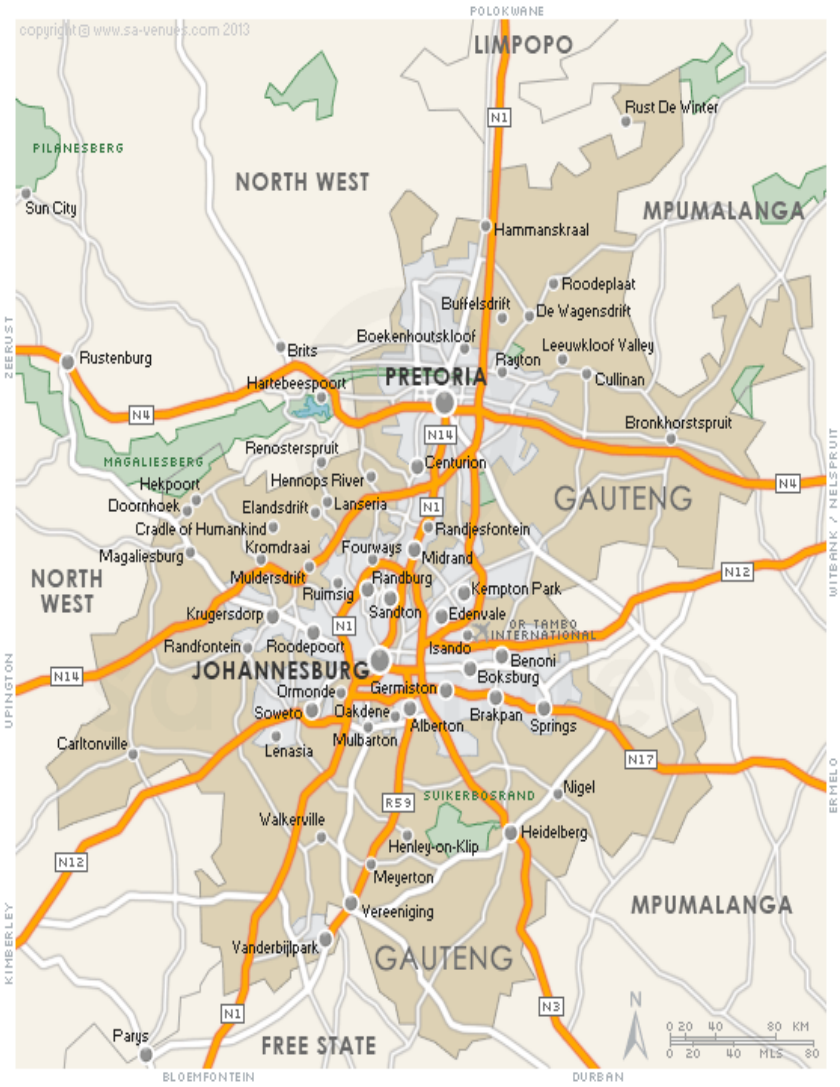

FIGURE 1.2: MAP OF GAUTENG

1.7 RESEARCH DESIGN AND METHODOLOGY

The research included both exploratory and descriptive investigations. Exploratory investigations entailed exploring current availability of bread products and current market/ consumer trends whereas descriptive aimed at gaining more insight in terms of consumers preferences, prioritisation and possible willingness to purchase bread alternatives that present non-traditional yet innovative/ more sustainable characteristics. The study was **cross sectional** in nature, which meant that data was collected from a specific population at a particular point in time (July 2020 to October 2020). It should be noted that data collection (in particularly during phase one) was somewhat restricted due to COVID-19 restrictions.

An exploratory sequential mixed method design was used to gather data to achieve the aim and objectives set for this study. To collect the data needed the research relied on two main phases which was guided by a Rapid Market Appraisal (RMA) for agricultural products. Various steps from the RMA guided this study including: step 1 (area selection), step 2 (product selection), step 3 (design of the consumer survey) and step 4 (the implementation of the consumer survey).

Once the area and product were selected a Market Quick Scan (MQS) was completed in order to explore market availability as well as aid the design of the consumer survey. Completing a MQS aided in identifying various bread products on the market, product characteristics as well as market and consumer trends. The MQS was completed through in store and online observations.

An RMA was used as an effective, uncomplicated, and quick way of collecting information for this study. The RMA was used to understand the existing market status of bread products and pinpoint possible availability of bread alternatives that could be deemed as more sustainable and investigate consumers' engagement with this product category. Following a multiphase approach allowed for a more holistic review and presentation of the problem at hand. It is important to note that the RMA lead this study by making use of the steps mentioned below:

Phase one – Market Quick Scan (MQS)

During phase one the first three steps of RMA were followed. This included the area selection, product selection and a MQS which was used in order to aid the design of the consumer survey in Phase 2. The MQS identified various consumer trends as well as an overview of gaps in the bread market through in store and online observation.

- **Area selection** (Figure 1.2) entailed selecting the location/ geographical area for the research study (main retailers within the Gauteng province) in order to show the market impact for the study (i.e., Checkers Loftus Park, Woolworths Hilcrest Boulevard, Dischem Hilcrest Boulevard, Kwikspar Groenkloof and Pick n Pay Hilcrest Boulevard. These stores were selected due to their close proximity to the University of Pretoria.

- In terms of **product selection**, bread products were chosen as it was identified as not only a popular, but essential item in all South African consumer baskets.
- A **MQS** was used to find the relevant data used to aid the design of the consumer survey in Phase two. The initial idea for the **MQS** included detailed in-store observation and stock taking in terms of bread product categories, assortment, brand, patronage of retailer, servings and important product attributed characteristics. Various consumer trends and gaps were observed whilst completing this step. Various product characteristics were also identified. However, with the onslaught of the COVID-19 pandemic and sudden restrictions that were put in place this method of data collection had to be amended. Ultimately the **MQS** was completed by making use of mostly online resources and supplementing the data with some in store observations once COVID-19 restrictions were lifted. This phase aided in developing and constructing of the consumer survey which was implemented in the second phase of the study.

Phase two – Implementation of a consumer survey

Phase two comprised of a structured questionnaire (quantitative in nature). Data collection for this phase commenced by collecting primary responses regarding consumers' current bread purchasing and consumption practices, preferences, prioritisation of intrinsic and extrinsic product attributes and consumers' willingness to adopt alternative/ more sustainable bread options. It was envisaged that this study by focussing on current market and consumer behaviour would support a more extensive investigation done by *Nutrifoods – Innovation for Life* that focus on identifying nutritious bread products.

1.7.1 The unit of analysis

The unit of analysis for the study consisted of adult male and female consumers residing in Gauteng, 21 years and older, who are responsible for purchasing/ who are the primary decision makers with respect to food purchasing and preparation. No restrictions were placed in terms of population group, income or education level. The procedure of collecting data was managed by the primary researcher who took the responsibility for recruiting suitable respondents.

1.7.2 Sampling technique and size

In terms of Phase one the Market Quick Scan, stores were purposively selected in terms of their representation of key retailing chains. Special care was also taken to ensure that chosen stores catered towards target markets that represented all socio-economic groups in South Africa. Convenience sampling, a non-probability sampling technique was used to gather data for phase two. Convenience sampling although deemed less rigorous is a statistical method of drawing representative data by selecting respondents based on ease and accessibility. The advantage of this type of sampling is the accessibility and speed with which data can be collected as well as its benefit for studies with financial limitations. The problem though, is that a convenient sample is not necessarily representative of the population that it was drawn from (Salkind, 2014). With this in mind, it was not the intention of this study to distinguish between the population groups that resided within the area of interest.

1.8 DATA COLLECTION AND ANALYSIS

This study relied on an electronic, self-administered questionnaire (Addendum B) that was generated through the Qualtrics online platform. The Qualtrics online platform not only allowed for the development of the measuring instrument, but also the distribution of the questionnaire via an electronic generated link that could be shared via various online platforms (WhatsApp, Facebook, LinkedIn and email). Due to the convenient sampling technique the survey managed to reach 1878 respondents of which 787 could be included in the final data set for analysis. Unfortunately, 1091 responses were omitted during the data cleaning process because they were incomplete. The data analysis for this particular study included both descriptive and inferential statistics.

1.9 ETHICS

Most institutions such as the University of Pretoria, adhere to a code of conduct regarding social research. The Ethics Committee under the faculty of Natural and Agricultural Sciences evaluated the research study at hand. The study was assessed, and protocol was followed in order to investigate the study's relevancy and if it adheres to the ethical

practices before it was implemented. The study was submitted for ethical clearance and was granted permission (ref number: NAS108/2020).

The questionnaire for this study contained a cover letter stating the aim of the study. The cover letter ensured confidentiality to respondents that were interested in taking part in the questionnaire. Respondents were furthermore guaranteed that participation is completely voluntary and any questions that made the respondent feel uncomfortable could be left unanswered. It was essential that all of the components and ideas were referenced in order to avoid plagiarism.

1.10 STRUCTURE OF THE STUDY

This dissertation consists of five chapters, presented as follows:

Chapter 1: Introduction

This chapter contains the background of the research, the problem statement and the justification is made. A brief overview of the research is given, along with the aims and objectives of the study.

Chapter 2: Literature review

This chapter presents a comprehensive review of literature introducing the main topics and constructs. The chapter commences with an introduction regarding wheat farming, bread production and some highlights pertaining to possible dilemmas associated to this product category. Following on this context pertaining to urban consumer lifestyles, the decision-making process, and the role of product attributes within the bread market is given. The literature review concludes with a discussion explicating concerns about climate change, its effect on consumer health and the need for alternative bread options that could be deemed as more sustainable.

Chapter 3: Research design and methodology

This chapter presents the research design and methodology that was implemented to conduct this study.

Chapter 4: Results and discussion

This chapter presents the results and discussion according to the objectives formulated for this study. The chapter commences by not only describing the sample in terms of demographic characteristics but also highlighting key aspects pertaining to the current South African bread market (i.e., availability and trends (Objective 1)). Results followed included an explication of the samples' purchasing and preferences pertaining to bread products (Objective 2). In conclusion possible market opportunities for alternative bread options were discussed (Objective 3).

Chapter 5: Conclusion

This chapter begins with a summary of the key findings pertaining to the main objectives. It is envisaged that the conclusions drawn could guide the revision of current bread category management practices within a retail-based environment and possibly support the future introduction of more sustainable bread options on the South African bread market. The chapter concludes with a discussion regarding the limitations of the study along with recommendations for any further investigation.

1.11 DEFINITIONS

TABLE 1.1: TERMS AND CONCEPTS

Terms and concepts		
Term of concept	**Definition**	**Reference**
Urbanisation `	The concept of urbanisation is the continuous mass movement of people from rural areas to urban areas such as cities.	(Bodo, 2019)
Modern day lifestyles	Modern lifestyle is a concept that launched in the beginning of the twentieth century and describes complex behavioural strategies and routines which can be treated as an indicator of social attributes that function in a social space.	(Cojocaru, C, C & Mitrea, 2014)
Consumer preferences	Consumer food preferences might seem to be straight forward and simple to understand but food preferences are complex and are made up of many different elements that can affect a consumer's decision. They are impacted by the amount that a consumer likes or dislikes an item.	(Vabø & Hansen, 2014)
Current consumption	Consumption means satisfying needs, wants, desires, goods and services necessary for fulfilling demands.	(Arıkan Saltık, Firat, Kutucuoğlu & tuncel, 2013)
Bread products	Bread is a staple food in many countries that contains a wide range of nutritional components that are important to human beings and their health.	(Gellynck *et al.*, 2009)

Terms and concepts		
Term of concept	**Definition**	**Reference**
Product attributes	Product attributes are the properties which describe a product. These attributes can be tangible and intangible and aid consumers in selecting various products.	(Auger, Devinney, Louviere & Burke, 2010)
Product availability	Product availability has the potential ability to trigger the intention to buy and is considered as a central feature in triggering sales. It has traditionally been believed to enhance involvement levels and purchase decision.	(Steinhart, Mazursky & Kamins, 2013)
Climate change	A change of climate that is attributed to human activity, that alters the composition of the global atmosphere and that is an addition to natural climate variability over time periods that are comparable.	(Pielke Jr, 2004)
Sustainability	Sustainability is maintaining well-being over a long, perhaps even an indefinite period.	(Kuhlman & Farrington, 2010)

1.12 CONCLUSION

This chapter introduced the topic of this study, outlined the background of the main concepts and stated the aim and objectives of the study. The importance of the study was justified in numerous ways. The next chapter comprises of the relevant literature related to the study.

Chapter 2

LITERATURE REVIEW

This chapter presents a comprehensive review of literature introducing the main topics and constructs. The chapter commences with an introduction regarding wheat farming, bread production and some highlights pertaining to possible dilemmas associated to this product category. Following on this context pertaining to urban consumer lifestyles, the decision-making process, and the role of product attributes within the bread market is given. The literature review concludes with a discussion explicating concerns about climate change, its effect on consumer health and the need for alternative bread options that could be deemed as more sustainable.

2.1 WHEAT, BREAD AND A LOOMING CLIMATE CHANGE

With a global population racing towards 10 billion people, wheat has been identified and celebrated for its significant role in shaping civilisations and/or societies globally (Shewry, 2009). By providing nutritional benefits and calories to many consumers in the form of staples such as bread, wheat was listed as one of the top three foods that has changed the world along with rice and maize (Anteneh & Asrat, 2020; Oder, 2021). Due to the agronomic adaptability, ease of storage and conversion to grain, demand for wheat has resulted in mass production (Enghiad, Ufer, Countryman & Thilmany, 2017; Melaku, 2019). Today, wheat is the most widely grown crop globally with estimates indicating that in terms of surface coverage, wheat is grown on 218 million hectares and presents a world trade that is greater than all other crops combined (Shewry, 2009). With this being said it is not surprising that concerns are being raised about wheats' vulnerability in terms of climate change. As wheat is highly dependent on rainfall, climate change could therefore have devastating results in terms of food security. For this reason, many countries encourage the sourcing of innovative more sustainable alternative grains.

In terms of South Africa when it comes to wheat and wheat related products, the country is already experiencing some strain due to climate change challenges. Recent droughts have contributed to a serious decline in total wheat production (Goldblatt, 2010). As wheat is an essential staple not only for humans but also for animal feed, the current instability of this grain cannot be ignored (Mancuso, Verduna, Blanc, Di Vita & Brun, 2019). Due to this, South Africa has had no choice but to become increasingly reliant on wheat imports to sustain demand for the population (Sosibo, Muchaonyerwa, Visser, Barnard, Dube &

Tsilo, 2017). With the increase in wheat prices, imports have become increasingly expensive and the prices of food products using wheat (i.e., bread) have increased too (Enghiad *et al.*, 2017). Bread is seen as a commodity of great social, political and economic significance in our country (Van der Walt, 2016). After maize, wheat-based bread is the second-most popular staple. Hence, a plight for more sustainable agriculture as well as food products is also present in South Africa as it contributes to numerous factors such as food security, social welfare, job creation and ecotourism (Goldblatt, 2010)

2.1.1 Farming wheat crops

Currently, the most important contributor to global human food supply are grains (Enghiad *et al.*, 2017). After rice, wheat has been identified as the second most important food grain (Anteneh & Asrat, 2020). Wheat is one of these major grains produced and consumed globally (Enghiad *et al.*, 2017) and in various countries, wheat is considered one of the “big three” cereal crops in the world. Being a dominant crop, which is being used for human consumption and livestock food (Shewry, 2009), wheat is a grain which is highly adaptable to yield potential and is commercially cultivated for mainly two types of wheat, durum wheat (*Triticum turgidum*) and bread wheat (*Triticum aestivum*) (Melaku, 2019).

Around 10,000 years ago, wheat was a crop which was domesticated, which changed human civilisation forever (Eckardt, 2010). The domestication of wheat enabled human kind to change from hunter gatherers to a more settled agricultural society (Eckardt, 2010). In recent times, there has been an increase in the production of wheat which has been driven by population growth around the world (Enghiad *et al.*, 2017). Wheat is a grain that is grown using more land area than any other commercial crop (Curtis, Rajaram & Gómez Macpherson, 2002). Being a adaptive grain, wheat can be cultivated in areas with somewhat diverse weather conditions and in areas with different soil types (Enghiad *et al.*, 2017). The health of the agricultural sector depends on the sustainability of farming methods used around the world (Goldblatt, 2010). It is therefore important to protect the productivity of land for long term sustainability.

Traditional and modern cultivation systems are used to cultivating wheat around the world (Tadesse, Bishaw & Assefa, 2019). With regard to traditional wheat cultivation methods,

the traditional know-how of farmers is essential, where farmers make use of various tools and resources which are available at hand (Tadesse *et al.*, 2019). Traditional farmers rely heavily on ox-plough for land preparation in order to prepare the land for planting and harvesting as the use of animals is less costly and the equipment was easy to maintain (Jankielsohn & Mohase, 2018). The traditional system of wheat cultivation's productivity is usually minimal and primarily depends on the soil's natural fertility and natural rainfall (Tadesse *et al.*, 2019). Modern cultivation systems are heavily dependent/ driven by consumer preferences and therefore make use of extensive technological innovation (Viatte, 2001). Tools such as tractors, combine harvesters, knowledge and technology are used and have been innovated in order to improve the modern cultivation systems (Reynolds & Borlaug, 2006).

Due to the growing population, our environment takes strain when trying to meet the large demand of wheat. Various environmental factors restrict the production and farming of major food crops such as wheat (Reynolds, Waddington, Anderson, Chew, True & Cullen, 2015). There are a wide range of natural biotic and abiotic limitations that are responsible for reducing productivity and minimising crop output (Reynolds *et al.*, 2015). These limitations of crop potential include poor soil quality; water scarcity, crop pests and crop diseases; and unstable temperatures (Reynolds *et al.*, 2015). In the rain-fed environments, abiotic stresses of wheat include drought and poor soil fertility which are important factors to consider when farming wheat crops (Tiwari, Mamrutha, Sareen, Sheoran, Tiwari, Sharma, Singh, Singh & Rane, 2017). High temperatures during the growth stages of wheat can cause a decrease in the yield which severely affects the formation and filling of grains (Sun, Hasegawa, Liu, Tang, Liu, Cao & Zhu, 2021). As for biotic stresses, the impact on wheat production include diseases, insects and weeds (Anteneh & Asrat, 2020). Phenomenon's such as these makes the productivity of agriculture unstable (Bockus, Bowden, Hunger, Morrill, Murray & Smiley, 2010).

Wheat is not only impacted by climate change, but in addition, wheat may be a contributor to the issue. Greenhouse gas emissions caused by farming practices are released into the atmosphere which may be responsible for worsening constraints on food production through the widespread negative impacts on the environment (Reynolds *et al.*, 2015). These greenhouse gas emissions add to the increasing climate change which results in various phenomenon's such as rising temperatures and drought or sometimes flooding (Tabari, Hosseinzadehtalaei, Thiery & Willems, 2021). Factors such as deforestation, soil

erosion, water depletion, pollution of soil, water and air caused by mass agriculture to sustain the growing demand of wheat crops are a threat to the sustainability of agriculture as a whole (Srivastav, Dhyani, Ranjan, Madhav & Sillanpää, 2021).

In South Africa wheat is one of the most grown cereals in the country after maize, which is essential for the populations dietary intake (Lephuthing, Tolmay, Baloyi, Hlongoane, Oliphant & Tsilo, 2021). Wheat production in South Africa, amongst others, is mostly modern and mechanized (Tadesse *et al.*, 2019). Similar to other developing countries, South Africa's population is growing and we are facing a wheat production crisis (Dube, Tsilo, Sosibo & Fanadzo, 2020). In South Africa, the problem does not only lie on the impact of abiotic and biotic stresses on wheat farming and production, but to the national yield of wheat (*Triticum aestivum* L.) decreasing by about 740 000 tons between 2002 and 2012, a gap was left that needed to be filled to meet the demand, which had to be imported says Dube *et al.* (2020). Africa's future is largely dependent on agriculture due to the extensive abundance of land able to grow crops (Anteneh & Asrat, 2020). Therefore, understanding extreme weather impacts on crops such as wheat as well as wheats impact on the environment is vital as it is important to maintain food security in South Africa.

2.1.2 Bread production and market trends

Today various market trends are surfacing due to changes in consumer preferences and other outside influences on the market such as fast-moving lifestyles and health awareness (Han, Ruiz-Garcia, Qian & Yang, 2018). The global bread market is adapting and growing which is driven by food demand from the growing population (Research, 2021). The global bread market was at 201 billion United States Dollars in 2021 and is expected to register a stable growth rate throughout the forecast period (More, 2021). The global bread market is expected to register a Compound Annual Growth Rate (CAGR) of 1,43% during 2019-2024 says Markets (2020). The baking industry represents a large portion of the Food and Beverage industry with global sales of an estimated $350 billion globally (Partners, 2020).

Global bread consumption is forecasted to reach 177 million tons by the year 2025 which is driven by factors such as urbanisation (Partners, 2020). Growth potential can be seen in organic, natural and health claim benefits in Europe which continues to dominate the

Global Bread Market (Markets, 2020). Consumer preference can be viewed in value-added, ethnic, fresh and artisanal bread as well as an increase in an appetite for indulgence (Markets, 2020).

Various market opportunities have surfaced in recent months with regard to bread products. Many of these trends exist in the category of culture (Caldaras, 2015). This can be seen through the growth in the product Tortillas, which are driven by the consumer segment's shift to ethnic, health and convenience which has grown by 11,5% (Partners, 2020). With regard to an increase in consumer health concerns, one of the top five trending bakery product claims include Gluten-free products at 10% (Partners, 2020). The demand for ingredients that are functional and nutritious in bread products are rising as bread makes up a large part of daily diets (Markets, 2020). The incorporation of natural ingredients such as natural preservatives, antioxidants and enzymes in bread products are on the rise (Markets, 2020). For example bread companies are attempting to replace shortenings with fat which includes Omega-9 & Omega-3 (Markets, 2020). Key trends amongst companies include cholesterol reduction, weight management, high protein and sugar control (Markets, 2020). These trends are currently encouraging research and development of innovative products that include products sourced from climate smart crops which are often deemed more sustainable in terms of improving food and livelihood security (Partey, Zougmoré, Ouédraogo & Campbell, 2018). In areas vulnerable to climate change this is essential.

In South Africa, one of the most affordable staple food options in 2020 is wheat flour, (Policy, 2020). Staple food, brown and white bread still remain affordable where a single serving of brown bread costs R0,74 and white bread costs R0,79 (Policy, 2020). For year-on-year grain based staple food inflation rates for April 2020, wheat flour were one of the highest increasing by 7,8% (Policy, 2020). There was severe financial pressures put on South African households due to the COVID-19 pandemic, which may increase/ favour the demand on staple food items such as wheat and bread products (Policy, 2020).

In recent times, the concept of sustainable food systems and sustainable diets has increased in importance where diets with low impact on the environment contribute to healthy lifestyles for future generations (Fanzo, 2019). This trend is not a simple decision for South Africa due to the economic state and the larger proportion of the poor consumer market. In countries such as South Africa, healthier and more sustainable food products

may be deemed expensive and less enjoyable (Temple & Steyn, 2011). Consumers often have a perception of these products possessing qualities of being culturally unfamiliar and expensive. Food choice, preparation and consumption are not only impacted by cost but also safety, convenience, family roles, religious beliefs and values (Delport, 2019). Cultural influence lead to differences in diets and are known to change food habits (El Ogrban, 2016).

2.1.2.1 Consumer trends

Wheat as well as bread have a rich cultural and religious history which make them an important aspect amongst consumers around the world. The history of bread production dates back to ancient times where the importance of bread was seen through numerous social aspects as it was used not only as a source of food, but as a form of compensation (Souki *et al*., 2016). Ingredients and recipes were passed down to children from generation to generation and often, traditional indigenous grains were used by many bakers (Muminova, 2020). Bakers started to produce the first fermented bread and production became a profession followed the need for bakeries to sustain the growing population (Souki *et al*., 2016). Bakeries spread throughout the world and consumers preferences started changing due to the larger variety of options made available. At this time, consumers then had the luxury to choose which bread products they wanted to consume.

Nowadays, the bread industry has evolved and there are numerous important value chain actors involved in order to allow us to consume the bread products we enjoy. A value chain is the full range of activities involved in bringing a product, such as bread, from farmers/ growers to consumers for consumption (Tadesse, 2017). Multiple phases of production, transformation and transport lead to delivering the final product to consumers for consumption of these bread products (Sacchi, Belletti, Biancalani, Lombardi & Stefani, 2019). In retail stores, where purchasing of bread takes place, the retailer's role has always been, to not only provide the physical product, but to provide customers with convenience and products of a sufficient quality when they need them (Varley, 2014). To address this, retailers often rely on strategic product management i.e., category management. Category management entails a retailing and purchasing concept in which the range of products purchased by a business organization or sold by a retailer is broken down into discrete groups of similar or related products; these groups are known as

product categories (Lodish, 1998). In terms of bread categories, these categories are still mostly limited to regular wheat options in terms of white and brown bread and some convenience lines (Siebert, 2018). More recently artisanal and health and well-being categories started gaining more traction due to the rise in consumer interest.

Eglite and Kunkulberga (2017) noted that consumer trends have a tremendous influence in terms of the assortment of bread products available. With bread developing into the highly sought after and well traded commodity it is known as today, bakers/ producers need to become aware of consumers' needs, preferences and various consumer trends present in the market. It is said that the aspect of consumer trends was noted and acted upon as early as 2500BC by Italian bakers who started to include alternative ingredients and practicing new and innovative baking techniques to meet the needs of their consumers (Souki *et al*., 2016). This transition introduced new consumer trends due to changing preferences of consumers as well as lifestyle changes. Numerous trends have surfaced in recent years, these trends have the ability to shape the future bread industry as we know it. Due to modernised and fast-moving lifestyles, consumers are becoming increasingly focused on attributes relating to health, pleasure and convenience (Martínez-Monzó, García-Segovia & Albors-Garrigos, 2013).

In terms of the **health** trend many bakers are redeveloping and changing food products due to an increased consumer interest in health foods (Kurek & Wyrwisz, 2015). Zepeda, Chang and Leviten-Reid (2006) mentioned that both young adults and seniors were most interested in organic foods. Since most consumers have become increasingly health conscious fortified bread, clean label and organic bread products are preferred across the world (Markets, 2020). Various market trends are related to health, where low calorie and low carbohydrate breads are being made using traditional methods which is becoming increasingly popular (Caldaras, 2015). Low-carb, high-fibre, multigrain and fortified bread products seem to appeal to consumers and has triggered market growth (Markets, 2020). Due to a rise in celiac disease, wheat is not the only source of flour found in bread products, alternative flours are becoming increasingly popular (Siddiqui, Mahmud, Abdi, Wanich, Farooqi, Settapramote, Khan & Wani, 2022). Gluten-free flours are becoming more and more popular when baking bread products (Gelski, 2019), therefore it is clear that bread products are constantly changing and evolving. The use of these natural and traditional ingredients and a variety of flours are now used to produce

gluten-free ranges of breads which may enhance health benefits for consumers around the world (Caldaras, 2015).

Pleasure has been identified as a dominant trend amongst food products in the past as well as in current times, where new products contain characteristics making them entertaining, ethnic or indulgent (Martinez & Gomez, 2019) Consumers continue to search for bread products which contain these features and enhance their experiences (Nelson, 2019). Various consumers are trying to acquire products which enhance self-fulfillment and a higher quality of life which has an overall impact of food choice and consumer trends around the world (Mehmeti & Xhoxhi, 2014). Higher quality products have become more appealing to consumers due to higher living expenses, therefore products such as exotic bread products can be perceived as affordable indulgences to better consumer pleasure (Mundel, Huddleston & Vodermeier, 2017). Consumer pleasure is not only found in the retail market as consumers find pleasure in restaurants where the atmosphere and presentation of the food demonstrate pleasure (Sulek & Hensley, 2004). This consumer trend of pleasure forces retailers and food-based businesses to provide a higher quality product as well as enjoyable bread products to meet the demand of consumers.

With regard to the **convenience** trend, due to modernised lifestyles consumers have less time to prepare food at home. Women, who are known to be primary food preparers in households around the world, have increased their working hours leaving households with little to no time left to cook or prepare foods (Martínez-Monzó *et al*., 2013). Due to lack of time and busy lifestyles household meals have therefore become less structured (De Boer, McCarthy, Cowan & Ryan, 2004). Therefore, it is important that consumers' need for easy-to-prepare bread items are available on the market. Foods that satisfy immediate wants/ needs amongst consumers (convenience orientated consumption) has increased which consists of easy-to-eat and easy to prepare food items (e.g. heat and eat food items) (Zink, 1997). Bread remains a popular regularly consumed food due to its convenience, ease of eating and nutritional value amongst many consumers (Venturi, Sanmartin, Taglieri, Nari, Andrich & Zinnai, 2016).

Culture plays a large role in consumer trends relating to bread products. Research shows that traditional recipes are making a comeback (Rasheed, Venkatesh, Singh, Renjini, Jha & Sharma, 2021). These traditional bread recipes can be adapted to current trends and

modern influences. It may be important for bakers to base recipes on classic and traditional bread recipes and ingredients but to ensure that these recipes are still relevant as an increasing demand for ethnic bread has surfaced (Markets, 2020). Flatbreads are popular in many parts of the world as they have been prepared in many cultures and are traditional, easy-to-prepare and easy-to-eat foods (Hor, Ghosh, Halder, Soren, Goswami, Bera, Singh, Dwivedi, Parua & Hossain, 2021). This may be why wraps and roti are extremely popular in retail markets now as they too, are easy-to-eat and convenient (Tsujimura, 2022).

Bread in South Africa has a deep history. After the Dutch settlers arrived at the Cape in the 17th century, planting and harvesting wheat with the purpose to produce bread is one of the oldest methods of commercial agriculture in Southern Africa (Stanwix, 2012). In modern times, a variety of bread products form part of a balanced and healthy diet for urban South African households (Noort *et al.*, 2022). Bread is an important staple in South Africa due as it does not require further processing before it can be consumed, alternatively bread is versatile as it can be eaten with almost anything (BADEM, 2021). Since consumer lifestyles have become fast paced, it is imperative that foods selected are easy, versatile and convenient to eat. Although South Africa is a diverse country, consumers tend to buy similar staple products such as bread on a daily basis due to many factors including affordability and accessibility (Cant, 2010). Primary retailers in South Africa include Checkers or Shoprite, Pick n Pay, Woolworths and Spar (Van der Walt, 2016). Most of these retailers in South Africa offer a variety of bread products on their shelves and some stores have personal in-store bakeries which makes bread easily accessible to the public (Van der Walt, 2016).

2.2 URBANISATION AND THE DAWN OF MODERN-DAY CONSUMERS

Current estimates state that at this point in time, over half of the worlds' population are living in urban areas (McGranahan & Satterthwaite, 2014). The fast pace of urbanisation has led to development in technology as well as industrialization (Macbeth & Collinson, 2002). Urbanisation is a long term and continuous process and in developing countries the rate of urbanisation is growing fast (Shukla *et al.*). It was established by the United Nations that half of the world's population was living in urban areas (McGranahan & Satterthwaite, 2014). Along with urbanisation comes promises of possible job

opportunities which draws people to cities in search for improved living conditions and better lifestyles (Ageev & Ageeva, 2015). However, recent literature indicates that urbanisation is not the be all and end all nor the solution that the world is so greatly in need of (Zhang, 2016). To date, industrialization and urbanisation are not only identified as major role players in terms of resource consumption and environmental degradation (especially in terms of water quality) where urbanising agricultural areas are putting pressure on land resources but also in terms of escalating unemployment and poverty that are often antecedents of malnutrition (Gulati & Roy, 2021; Zhang, 2016). Countries undergoing rapid urbanisation not only experience change in daily lifestyles but changes dietary habits (Steyn, Nel, Parker, Ayah & David-Kigaru, 2012). Due to overly processed foods (due to the need to feed the growing population) consumers are consuming food products that not only lack fibre but contain higher fat, sugar and sodium content leading to non-communicable diseases (NCDs) (Steyn *et al.*, 2012). The development of NCDs has been associated with an increase in body weight as well as unfavourable fat distribution in the body (Purnell, 2018). Due to the importance placed on sustainability and the future well-being of generations to come, it is vital to understand urbanisation but in particularly the modern lifestyles and dietary patterns that it fosters.

It is estimated that urban population growth will be the highest in the developing world, where Africa respectively accounts for 32.5% of the total urban population growth in years 2011-2050 says Zhang (2016). In South Africa, attitudes towards urbanisation are complicated, reflecting urban exclusion and rural deprivation where poor communities are forced to live far away from jobs and often in environments with undeveloped infrastructure (Turok & Borel-Saladin, 2014). Environmental issues such as environmental degradation are one of the major challenges South Africa is faced with, as a result of urbanisation (Turok & Borel-Saladin, 2014). Along with environmental impacts, social aspects have also been impacted by urbanisation in South Africa. The rapid growth of urban food insecurity and malnutrition are growing due to rapid urbanisation (Crush, Frayne & McLachlan, 2011). Food availability is not the key issue contributing to malnutrition but rather the concept of food instability combined with poor health issues (Smith & Haddad, 2001). An aspect associated with food insecurity is the effect of limited access to quality food in household diets in South Africa (Crush *et al.*, 2011).

2.2.1 Modern lifestyles

Modernised consumer lifestyles are considered to be fast paced and money is a priority rather than physical health and wellbeing of consumers (Singh, Banerjee, Anas, Singh & Qamar, 2020). This disregard of wellbeing and health may be brought about by globalization, modernisation and urbanisation which continuously separates the world's population (Sproesser, Ruby, Arbit, Akotia, dos Santos Alvarenga, Bhangaokar, Furumitsu, Hu, Imada & Kaptan, 2019). Rising income, rapid modernisation and a growing middle class leads to various adjustments in dietary preferences of consumers (Fresco, Ruben & Herens, 2017). The concept of urbanisation creates a challenge with regard to evolving consumption patterns of consumers (King, Cole, Farber, Eisenbrand, Zabaras, Fox & Hill, 2017). Ronquest-Ross *et al.* (2015) highlights that food availability, accessibility and choice are all impacted by urban influences and that urbanised consumers often present dietary patterns that are deemed unsustainable and damaging to their health (Sproesser *et al.*, 2019). Modern diets often consist of elements that may be harmful to one's health such as refined carbohydrates and saturated fats instead of foods containing complex carbohydrates and fibre (which was a large part of traditional diets) (MA, 2015).

Due to the continuous rise in urbanisation, food systems have been forced to transform many areas of the value chain including farm production, processing, packaging, distribution and consumption (Tefft & Jonasova, 2020). The concept of urbanisation creates a challenge with regard to evolving consumption patterns of consumers (Seto & Ramankutty, 2016). The wide variety of food products available to consumers gives them the opportunity to choose. This creates a variety of habits, tastes and leads to the creation of market trends. It is certain that urbanisation brings considerable changes in terms of new opportunities (i.e., transformation of social-economic conditions and reduced human vulnerabilities) to low- and middle-income countries, however, negative implications (i.e., increased poverty, environmental degradation and negative dietary habits) are inevitable too (Turok & Borel-Saladin, 2014). Currently, the world is changing with regard to what people consume and the way that they do so. With this being said availability, accessibility and choice are all impacted (Sproesser *et al.*, 2019). In many countries around the world there has naturally been a shift from traditional to modern consumption as lifestyles adapt and change (Hassen, El Bilali, Allahyari, Berjan & Fotina, 2021). It is noted that modern lifestyles and modern eating patterns present many negative sustainability and health

effects, whereas traditional eating patterns are more likely to be healthier and more sustainable (Barros, Moreno, Arruda, de Assis, Celedonio, Silva, Pinto & Maia, 2021). Unfortunately these modernised diets are often a result of limited consumer choices that are dependent on a country's in food supply (availability) and food security (accessibility) (Sproesser *et al.*, 2019).

Availability is mainly a function of food production and supply (Ekpenyong, 2015). Due to the growing urbanised population, farming takes place in environments that were traditionally perceived as inappropriate for agriculture (Kouassi, Gyau, Diby, Bene & Kouamé, 2021). Additionally, water (a key resource for agriculture) is becoming more scarce as water is often wasted on domestic and agricultural use which puts sufficient food supply at risk (Koohafkan & Stewart, 2008). Issues such as these need to be monitored in order to ensure that production and supply of staple food products, such as bread, can be maintained for the growing urbanised population. Better infrastructure brought by urbanisation is likely to have a positive impact of physical access to food, however, in developing countries inadequate infrastructure remains a major problem (Szabo, 2016).

Accessibility to quality food is an important aspect to consumer lifestyles. Research shows that urbanisation is highly correlated with access to processed foodstuffs (Popkin & Nielsen, 2003). In a modernised world, processed foods are often the most accessible type of food in retail stores especially in terms of affordability and proximity (Wood, Williams, Nagarajan & Sacks, 2021). The ease of accessibility of these foods leads to health concerns such as obesity and chronic diseases in developing countries (Narula, Wong, Dehghan, Mente, Rangarajan, Lanas, Lopez-Jaramillo, Rohatgi, Lakshmi & Varma, 2021). Processed and pre-prepared foods have become accessible to consumers at reasonable prices on the market, whereas traditional staple foods, such as bread, are often more expensive in urban areas than the cost of these potentially harmful processed foods (Ekpenyong, 2015). Although a wider variety of food has become accessible on the market consumers are continuously consuming foods that contain a higher proportion of fats and sugar which can be caused by numerous factors such as convenience (Imtiyaz, Soni & Yukongdi, 2021). In addition to modernised foods containing saturated fat and high sugar content, processed foods often contain artificial colourants, preservatives and chemical pesticides (Szabo, 2016). It is therefore essential that healthier and more sustainable options are made readily accessible to the consumer market.

2.2.2 The South African consumer

It is evident that consumers' food *choices* have evolved. The pace of lifestyles in urbanised areas are fast and upbeat and there is a growing need for meals/food that requires minimal cooking time. This creates a demand for time saving meals such as packaged meals, meals away from home and convenience food that can be consumed on the go (Seto & Ramankutty, 2016). These factors have impacted urban consumer lifestyles, leading to higher demand and massive market expansion of convenience food options (Mendez & Popkin, 2004). Additionally, traditional meals are often replaced with spontaneous and unplanned food purchases driven by limited time and affordability which impacts consumer choice. As a result of these changes in lifestyles, consumers are affected with chronic and degenerative diseases which result in a so called nutrition transition (Popkin & Ng, 2022). This nutrition transition is presented as a cause of rural to urban transitions which impacts diets, resulting in eating patterns which are highly refined, high in fat, saturated fat, added sugar, sodium and low in fibre (Steyn *et al.*, 2012).

More than 60% of South African's population currently live in urbanised areas (Pereira, 2014). South Africa is undergoing rapid urbanisation resulting in a change in lifestyles and dietary habits resulting in a nutrition transition (Shava & Vyas-Doorgapersad, 2022). South Africa is a heterogeneous and multicultural country therefore there are numerous factors that influence South Africans' eating patterns (Viljoen & Gericke, 2001). In the past traditional foods displayed culture, identity, heritage and they supported the sustainability of people living in rural areas in South Africa (Lipan *et al.*, 2017) These traditional foods are both healthy and delicious and contain health benefits including immune and circulatory system support, aiding brain function and numerous other metabolic functions of the human body (Singh *et al.*, 2020) Unfortunately, as modernisation and urbanisation accelerates, crops such as wheat have taken over to sustain the South African population. Modernised wheat-based breads have become a staple for South African consumers and traditional crops and methods are increasingly disregarded. As a result, non-communicable diseases are prominent amongst the population due to detrimental health choices and physical inactivity (Steyn *et al.*, 2012). South African consumers' are consuming less staple foods which are rich in starch, plant protein and dietary fibre and more foods from animal sources (Vorster, Kruger & Margetts, 2011). Diets are more palatable containing snack foods, fast and convenient foods which could already be associated with an increase in NCD's (Kruger, Venter & Vorster, 2001;

Vorster, Venter, Kruger, Kruger, Malan, Wissing, De Ridder, Veldman, Steyn & Margetts, 2000). Along with economic development consumers will choose to follow a more palatable diet rather than a traditional diet, the food industry makes sure that these kinds of foods are affordable, available and extensively advertised through media in developing countries such as South Africa (Hawkes, 2006). Despite these negative impacts, there is hope as it is accepted that consumers generally care about what they consume and the impact food production and consumption have on the environment says Eglite and Kunkulberga (2017). Consumers are demonstrating a greater concern and interest with regard to purchasing sustainable food products such as bread. Therefore, it is important to understand and acknowledge the value of the consumer decision making process and what pushes consumers to make the decisions that they are currently making when it comes to their food choices.

2.2.3 Consumer behaviour and the role of influential attributes when selecting bread

The term "consumer" is often defined as "any one engaging in any activities of evaluating, acquiring, using or disposing of goods and services", (Tyagi and Kumar (2004). Priest, Carter and Statt (2013) explained that consumer behaviour includes buying decisions and consumption patterns (routine[6], limited[7] or extensive[8]) that is characterised by the amount of time and effort which is often related to the perception of risk (Stankevich, 2017). "Perceived risk" refers to the nature and amount of risk perceived by a consumer when deciding on a particular purchasing decision (Bauer, 1960). In terms of bread consumption buying behaviour is mostly habitual/ routine and often does not involve major risks, which might have contributed to the positive nature of the current bread market. Despite the limited risk involved in this product category it is still important to take note of consumers' decision making and various attributes that influence bread products in order to identify possible market opportunities.

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[6] Routine consumer behaviour - a **buying** situation in which the **buyer** has had considerable past experience; also called Automatic Response **Behaviour** or Habitual Response **Behaviour** Solomon, M., Russell-Bennett, R. & Previte, J. 2012. *Consumer behaviour.* Pearson Higher Education AU..

[7] Limited consumer behaviour - When customers make **limited decisions**, they take a small amount of time to consider the decision, memory and past experiences and some word of mouth might come in to play which allows for making **decisions** based on logical inferences ibid..

[8] Extensive consumer behaviour and or decision making is the term used in marketing to describe a highly involved consumer **decision** regarding whether or not to purchase a product ibid..

2.2.3.1 The consumer decision making process

Consumer decision making is a cognitive process that involves mental activities that play a role in determining physical activities needed to meet a need or solve a problem at hand (Olyott, 2018). This process ranges from problem recognition to post-purchase behaviours (Qazzafi, 2019). These decisions can often be difficult for consumers as they are faced with numerous alternatives, within an environment, which are constantly changing (Payne, Bettman & Johnson, 1991). The extent of a consumer's involvement in a purchasing decision depends on the importance and risk of the purchase as well as the potential consequences when a poor decision is made (Pop, Săplăcan, Dabija & Alt, 2022). Possible risks when making a decision include not only financial risk but social and safety risks related to the product (Olyott, 2018). Consumers are more involved in decision-making when the product portrays personal features about the individual which has an impact on an individual's self-image (Klabi & Binzafrah, 2022). Understanding the decision making process is vital in order to find out how consumers plan their buying decisions (Peter, Olson & Grunert, 1999). Researchers can find out answers such as: what consumers think of a product; what consumers prefer and why consumers may purchase one product over another (Peter *et al.*, 1999).

Consumer decision making is often explained as a straightforward five step process, however, it is often complicated by various situational factors. Numerous internal and external forces compete for consumers' attention when consumers' decide on food products (Clifford, Cravens & Knapp, 2022). It is important to remember that these internal and external factors differ from one consumer to another.

Internal factors refer to consumer related attributes including consumer beliefs, values, emotions which influences how a consumer reacts to a situation or product (Dietrich, 2010). Additionally risk perception and the understanding of the environmental system come into play which can all be referred to as a consumers mental model says Clifford *et al.* (2022). These influences are known as personal influences and include consumer perceptions and lifestyles, which affect all purchase decisions of consumers' (Dawson & Kim, 2009). Additional internal factors include attitudes of customers towards environmental issues as well as perceived behaviour as a result of his/her actions (Piligrimienė, Žukauskaitė, Korzilius, Banytė & Dovalienė, 2020).

External factors consist of age, occupation, consumer's education level, marital status and household that impact a consumer's purchase decision (Bennett & Ali-Choudhury, 2009). These external factors may be influenced by a consumer's family, relationships friends as well as social media. The shopping environment or retail environment is an important external factor which plays a role in consumer decisions (Piligrimienė *et al.*, 2020).

It is important for researchers to understand the traditional model of consumer decision making in order to understand why consumers favour/ prefer and ultimately purchase products.

Stage 1: Problem or Need recognition: This is when consumers realise that they would like to fulfil either a need or want which direct them into purchasing a product (Stankevich, 2017). In this stage, the consumer becomes aware of the difference between actual and desired state where both internal and external stimuli come into play (Lee, 2005). The actual/ current state is the consumer's perceived state and the desired state is the perceived state in which the consumer would like to be in (Olyott, 2018). A consumer might be hungry leading him/her to feel the need to eat. Maslow's Hierarchy of needs classifies food as a physiological need which is a basic need alongside access to water (Zalenski & Raspa, 2006). Bread is an important staple food around the world and therefore may be one of the most essential food items to combat hunger. After a consumer recognises the need to eat, an information search will take place where the consumer will weigh possible alternatives in hopes to meet the specific need. A number of factors may impact the complexity of these purchasing decisions. Some customers may be more involved in the decision making of a food product in order to manage their health although some consumers may opt for a less healthy and less sustainable option. Consumers that are more health-conscious tend to read food labels more often in search for healthier alternatives (Ellison, Lusk & Davis, 2013).

Stage 2: Information Search: After a consumer has developed a need or a want for the product, he/she can start an information search regarding the possible alternatives that he/she can purchase in order to meet the need or want (Stankevich, 2017). Often, a consumers memory and past experiences may be triggered with a product (Stankevich, 2017). Bowring (2006) states that the most potent sense in evoking memory is smell. Smell/ aroma and taste are important aspects of breadmaking and has the ability to trigger

memories for many consumers (Herakova & Cooks, 2017). Some customers may do external research regarding a particular product, which may include personal sources (talking to family and friends), commercial sources (online stores and packaging), public sources such as social media and experimental sources where the consumer examines and consumers the product (Qazzafi, 2019). However, in most cases consumers' involvement and search for information pertaining to bread is very limited due to the habitual nature of their purchases. New product developers therefore need to pay special attention to this aspect when launching and or trying to penetrate this market as consumers are often set in their ways and are not necessarily seeking information or an alternative option (Leek, Szmigin & Carrigan, 2001). When consumers repeatedly purchase the same product, the customer tends to become familiar with the attributes that the product offers and in this case, consumers are likely to continue to purchase the same brand (Koll & Plank, 2022). This phenomenon may be referred to as the habitual decision-making process where customers make limited evaluation if any, of alternatives which may result in repeat buying behaviour (Lautiainen, 2015). Food purchases (staple foods in particular such as bread) tend to be very habitual or routine which require little or no conscious effort according to Solomon (2013).

Stage 3: Evaluation of alternatives: Different product alternatives are evaluated by the consumer on the market. Consumers choose the most important attributes according to preferred factors such as price, quality, location and brand (Stankevich, 2017). In this step, connections such as emotional connections and experiences along with advertising and brand play a critical role in the consumer decision-making process. The evaluation of alternatives is where consumer preferences and important product attributes play a role in the decision making process (Gil & Sánchez, 1997). Consumer preferences of products differ from one consumer to another as consumers are diverse and they have different needs and wants (Nugroho, 2019). Therefore, in order to purchase good or service, preferences influence a consumer's decision-making process (Nugroho, 2019). Consumer preferences are defined as subjective (individual) tastes as measured by utility, of various bundles of goods that permit the customer to rank goods according to the levels of utility that they give the consumer (Guleria & Parmar, 2015).

Stage 4: Purchasing decision: Once a customer chooses a product, the consumer will implement the decision and make an actual purchase (Stankevich, 2017). Consumers choice when purchasing staple foodstuffs as bread, are likely to be influenced by routine

choices and lifestyles (Stavkova & Turcinkova, 2005). As bread is mostly routinely purchased, consumers often purchase the product out of habit (Skořepa & Pícha, 2016).

Stage 5: Post-purchase behaviour: This is the final stage of the decision-making process, and it involves consumers evaluation of product performance. In this step, customer satisfaction and dissatisfaction may be measured once the consumer has made their decision (Clifford *et al.*, 2022). If customers' expectations exceed the product's performance, the customer will be satisfied with the product but if not, customers will not be satisfied and most likely not purchase the same product again (Olyott, 2018). Satisfaction or dissatisfaction with a purchase will influence a consumer's future decision making process for their next of similar purchase (Lee, 2005).

2.2.3.2 Consumer preferences and influential product attributes when selecting bread

When selecting bread products, consumers buying decisions are dependent on a number of factors such as price, taste, packaging, size and colour (Adepoju & Oyewole, 2013). It is vital to recognise the usefulness of the decision making process in order to find out how consumers plan their buying decisions as well as which product attributes are prioritised by the consumer (Peter *et al.*, 1999). Researchers can find out numerous answers about a product and why consumers select a specific product over another. This may be achieved by evaluating consumers prioritisation of intrinsic and extrinsic product attributes.

Consumer food preferences might seem to be straight forward and simple to understand but food preferences are complex and are made up of many different elements that can effect a consumer's decision (Vabø & Hansen, 2014). Consumers preference or prioritisation of a product depends on both intrinsic and extrinsic cues (Geel, Kinnear & De Kock, 2005). Food preferences are determined by how much a consumer likes or dislikes a food (Viljoen & Gericke, 2001) and which attributes are prioritised over others. Consumer preferences of products and services, differ from one consumer to another as they have different needs and wants (Nugroho, 2019). In order to purchase goods or services, preferences influence a consumer's decision-making process (Nugroho, 2019). Preferences are therefore based on a consumer's perception of a product. Perception can be defines as a process by which a consumer or individual observes, selects,

organises and reacts to environmental attributes in a meaningful way (Geel *et al.*, 2005). Food preferences, that can be measured by using checklists or taste tests, are sometimes thought to predict real life food consumption amongst consumers (Drewnowski, 1997).

In the study done by Viljoen & Gericke (2001), bread and baked products were rated as high preference items. Preferences result in a consumer's decision to purchase one bread product over another. Consumer food preferences might seem to be straight forward and simple to understand but food preferences are complex and are made up of many different elements that can effect a consumers decision (Vabø & Hansen, 2014). Public health is a majorly influenced by the appropriate intake of nutrients and this may impact a consumers choice of food (Bartkiene, Steibliene, Adomaitiene, Juodeikiene, Cernauskas, Lele, Klupsaite, Zadeike, Jarutiene & Guiné, 2019).

In terms of food choice and decisions relating to food consumption it is important to take note of the influence of not only external factors such as consumer trends (as presented in section 2.1.2.1) but also specifically product related attributes that feature strongly during stage 3 (evaluation of alternatives). Human senses have always been used to evaluate food which ensures that products have desirable characteristics and are of a high quality (Lawless & Heymann, 2013). Acceptance or rejection of a product by a consumer is not limited to simply just taste and smell but to how consumers prioritise these attributes (Weightman, 2018). The concept of food choice is therefore regarded as complex and understanding consumers' preferences regarding certain intrinsic and extrinsic characteristics is therefore valuable.

Recent studies investigating consumer behaviour pertaining to food purchases and consumption, are extensive and are of significant importance to industry role-players (Simi Simon, 2021). Unfortunately, research regarding the factors influencing consumers' decision making, preferences and ultimate selection of bread within a South African context seems to be lacking (Hallström, 2011). Simi Simon (2021) highlights that understanding and identifying the factors that influence consumers' preferences and ultimate purchase decisions are vital to marketers and that insights like these can assist retailers to develop product offerings that satisfy consumer needs. Understanding the prioritisation of these attributes that influence consumer preferences and decision making when buying bread can also assist in identifying possible opportunities for new product launches such as more sustainable alternatives within the bread market.

2.2.3.3 Intrinsic product attributes

Intrinsic factors allow for measurement of physical quality. Judgement of quality depends on a consumer's needs, goals and perceptions (Brečić, Mesić & Cerjak, 2017). Intrinsic cues refer to the sensory qualities of a bread product, including appearance, tastes, smell, colour, form and touch (Geel *et al.*, 2005). Other intrinsic characteristics include the nutritional value, freshness and safety of the food product (Swanepoel, 2015). These factors refer to attributes that are part of a physical product (Oliveira *et al.*, 2017). Intrinsic factors cannot be changed without altering the product itself (Piqueras-Fiszman & Spence, 2015). Sensory responses to food's taste, smell and texture help determine food preferences and eating habits (Drewnowski, 1997). Intrinsic or sensory properties have a bigger impact on emotions than extrinsic factors do says Weightman (2018).

Food manufacturers and distributers are driven to avoid lawsuits caused by negligence. **Food safety** procedures are followed to ensure that their products are safe and free from foodborne illnesses which may impact a consumer's health. Symptoms of foodborne illness include inflammation, nausea, diarrhoea and vomiting (Brown, 2019). These foodborne illnesses can severely impact consumers that are very young, the elderly and consumers suffering from diseases such as cancer or AIDS (Brown, 2019). Consumers with food allergies need to be taken into consideration with regard to a products safety precaution. It is essential that food safety practices are revised and maintained, especially during a global pandemic (de Souza, Miyahira, Matheus, de Brito Nogueira, Maragoni-Santos, Barros, Antunes & Fai, 2022). In a study done by Dumas, Lee, Harris, Yaroch, Pomeroy and Blanck (2022), it was mentioned that during the COVID-19 pandemic numerous consumers experienced heightened food safety concerns which may have had an impact of how they perceived store bought foodstuffs such as bread.

Usually, **taste** is the most influential factor in a consumers selection of a food product (Brown, 2019). In most cases taste may only be evaluated after purchasing a product, except in some cases where free samples are given to consumers to test a product (Brečić *et al.*, 2017). Offering a sample of a product to a consumer is very important so that the consumer is aware of the product's taste (Brečić *et al.*, 2017). Not everyone perceives taste the same way as taste can be genetic and may also be influenced by outside influences (Brown, 2019). Various procedures especially in Italy and France are known to improve the flavour of bread products through fermentations of yeast and

sourdough prior to the dough preparation, resulting in a richer and more aromatic flavour than white bread (Callejo, 2011). Essential taste attributes present in bread products according to Callejo (2011), are bitterness, saltiness and sourness.

Health and nutrition has resulted in changing food consumption patterns. Changing food habits of consumers is due to the increased awareness that a person's diet can be related to health concerns leading to death such as cancer, heart disease and diabetes (Brown, 2019). To reduce dietary risk factors, consumers need to take a products **nutritional value**, properties and serving sizes into consideration. Consumers are urged to follow dietary guidelines and more consumers are reading the nutritional facts on food labels in an effort to understand what they are consuming (Rupprecht, Fujiyoshi, McGreevy & Tayasu, 2020). Cleveland, Moshfegh, Albertson and Goldman (2000) recommend eating at least three servings of bread per day, one serving of bread is equal to 28g (one slice of bread) (Herforth, Arimond, Álvarez-Sánchez, Coates, Christianson & Muehlhoff, 2019). Some bread products offer a positive impact on human health due to the presence of numerous important nutritional components including dietary fibre, minerals and vitamins (Gellynck *et al.*, 2009).

The eyes receive the first impression of foods such as shapes, colours and consistency (Brown, 2019). This can assist a consumer by viewing any defects that the food product might have. With regard to a food product such as bread, the **visual appearance** can show the consumer the degree to which the product was heated to. The colour pallet of food items such as bread contributes to their overall appeal says Brown (2019). Appearance of crumb colour and crust colour is of vital importance to consumers when selecting bread products (Salmenkallio-Marttila, Roininen & Autio, 2004). The appearance of bread products can be pale or dark and are related to numerous factors within the breadmaking process which may impact a consumer's selection of a bread product. The visual appearance of bread products depend on numerous factors such as the type of flour used, the extraction rate, the amount kneading (gluten content) and the Millard reactions that take place in the oven during baking (Callejo, 2011).

A food's **texture** and consistency can operate inside the mouth or through a consumers fingers (Brown, 2019). Although a consumers eyes give the first clue as to how a product feels, texture is a combination of perceptions including touch, tenderness, consistency and mouthfeel (Brown, 2019). Along with the presence of gluten (elasticity), the size and

structure of the crumb present in bread products contribute to consumer acceptability of a product as softness/ hardness can describe texture in bread products (Callejo, 2011).

Ingredients in food products play a crucial role not only aspects such as visual appearance, taste and the overall structure of a food item (Wang & Bohn, 2012). When positioning products such as bread on the market it is essential for food producers to consider how a product is perceived by consumers (Aschemann-Witzel, Varela & Peschel, 2019). Consumers are said to be increasingly concerned with products portraying a “clean label”, meaning that the ingredients are less processed, less artificial and that more natural ingredients are incorporated into the final product (Noguerol, Pagán, García-Segovia & Varela, 2021). Although consumers are concerned with which ingredients are present in bread products, it is essential that product developers are mindful in terms of important attributes such as freshness, quality, taste and texture (Vargas & Simsek, 2021). Bread products contain essential and functional ingredients which create the bread products consumers enjoy today. Waziiroh, Schoenlechner, Jaeger, Brusadelli and Bender (2022) say that it is important to understand the ingredients in gluten-free/ alternative bread products to develop a product that contains the attributes which are enjoyed by the consumer (i.e., bread structure).

As food is consumed by humans for survival, it is essential that various plants are processed prior to consumption. Various **processing techniques** are followed in order to produce the bread products which are enjoyed by consumers. Food production is the process of transforming raw materials into food products which are edible and safe for consumer consumption (Bonciu, 2018). There are various types of food production including, amongst others cultivating, harvesting, crop management and farming (Reynolds *et al.*, 2015). Consumers are often concerned with food safety with regard to these production methods and it is essential that the industry ensures food safety regulations are if followed (Sanders, 1999).

The **aroma** or smell of a product is almost as important as appearance when food items such as bread are evaluated according to desirability (Brown, 2019). Freshly baked bread can have a distinct aroma, this may persuade consumers to purchase the product. Smell has the ability to evoke an emotion or memory for a consumer which may directly impact a consumers decision (Paluchová, Berčík & Horská, 2017). Quílez, Ruiz and Romero (2006), says that bread aroma is one of the most important attributes that influence

acceptance of consumers. The aroma of bread is created not only through the recipe but through processes including dough fermentation by yeast and through Maillard and caramelization reactions (Callejo, 2011).

2.2.3.4 Extrinsic product attributes

Elements that can influence the consumer from outside are considered extrinsic cues (Geel *et al.*, 2005). Examples of extrinsic cues are price, nutritional information, brand names, store environment, production information and personal variables (Geel *et al.*, 2005). Extrinsic factors relate to the product without physically being part of the product itself and when changed, do not alter the product physically, these include factors such as packaging, branding, store image, price, origin, labels and production method. In most cases, the quality of a service providers relationships with customers determines a products success. These factors are not part of the physical product itself and can be modified without changing the actual characteristics that the product offers.

In addition to extending shelf life of bread products and to protect bread from spoilage, oxygen and moulds, product benefits are well communicated through **packaging** methods to consumers (Lo, Tung & Huang, 2017; Pasqualone, 2019). It is shown in research that consumers judge a product's values based on packaging uniqueness and customers are usually eager to experiment with well packaged products (Lo *et al.*, 2017). A strong relationship is built between customers and the brand through the use of packaging (Lo *et al.*, 2017). Various studies which have been done on consumers have focused on design elements of packaging for products (Ketelsen, Janssen & Hamm, 2020) these design elements consist of shape, line, colour, space and typography in order to positively influence consumer experiences and expectations of a product (Bahrainizad & Rajabi, 2018). The shape of packaging will influence product preferences, for example rounder packaging may be associated with a sweet food product and packaging with a geometric shape may be associated with sour tasting products (Marques da Rosa, Spence & Miletto Tonetto, 2019). Additionally, the colour of food product packaging may impact a consumers decision to purchase/ choose one product over another and may have an impact on the taste of the product (Martinez, Rando, Agante & Abreu, 2021). The shape and colour of packaging has been known to influence the perceived health benefits of a food product (Plasek, Lakner & Temesi, 2020).

In terms of **store image,** a retail store's image develops from a customer's objective and subjective perception of the store, which may be learned over time (Diallo & Cliquet, 2016). Objective perception is experienced by the consumer as tangible perception and subjective relating to psychological perceptions of how a store may be perceived (Shen, Wan & Li, 2022). Store image structure may be conceptualised within the following dimensions, which are listed as follows: merchandise, customer service, clientele, facilities offered by the store, convenience, promotions/ promotional material, store "feel"/ ambiance, institutional factors and the satisfaction received once the payment has been made or alternatively once the customer has left the store says Lindquist (1974).

Consumers make a monetary sacrifice in order to own/ purchase and consume a food product (Swanepoel, 2015). Usually the **price** of a product is compared by consumers in terms of what they have paid for the product and what they receive in return as affirmation of a product's quality (Brečić *et al.*, 2017). Price can be objective and perceived, *objective* price refers to the actual price of a product and *perceived* price indicates the price which is determined by the customer (Han & Ryu, 2009). As bread is a staple product in South Africa, the slightest increase may be concerning to consumers (Caspi, Pelletier, Harnack, Erickson, Lenk & Laska, 2017). As staple foods are essential in maintaining nutritional stability, consumers are more aware of even a slight increase in products such as bread (Hasan, 2019).

The **branding** of a food product is seen to associate a consumer with values of a specific company or product (Pearson, 2016). Consumers rely brands in order to make good purchasing decisions when selecting products (Sharma, Upadhayay & Thakur). Often, the reason consumers select a brand is because they relate to the values that the brand portrays (Kahle & Xie, 2018). The values offered by manufacturers to customers may be used as a source of competitive advantage. Quality guaranteed by a brand is carried out by features, benefits and values which in some instances may make a consumer's decision slightly easier (Pearson, 2016). Usually, consumers are familiar with numerous brands within a product category specifically with regard to bread products, for example Blue Ribbon and Albany (Moula, 2006) although, consumers may choose one brand as their regular purchase as they trust the brand and values it has to offer.

Various **labelling** regulations were developed in order to ease consumer's concerns with regard to what they are consuming (Brown, 2019). Consumers are made aware of

numerous factors including: the ingredients of the food product or contents, the name and form of the product, the net amount of the food, the manufacturer details and the nutritional facts of the product. Although labelling is important to inform consumers about the product, it is additionally used as a marketing tool to attract consumers to purchase a product. Food labels are an important communication tool between the consumer and food producers (Ababio, Adi & Amoah, 2012). Food labels provide important product information regarding a specific product and not only display the name, date and ingredients of the product but additionally, the information which aids in safe consumption (i.e., important dates, nutritional information, allergy warnings and storage instructions) (Degnan, 1997).

2.2.4 Climate change and consumers' willingness to adopt more sustainable bread options

An enormous challenge has surfaced in recent years where there is a growing need to increase food production, although the need to significantly decrease the climate impact of this production must be sustained (Smith, Martino, Cai, Gwary, Janzen, Kumar, McCarl, Ogle, O'Mara & Rice, 2008). As preferences and consumption patterns of consumers drive the production of food, these consumption behaviours of individual consumers are creating a negative impact on our natural environment (Dietz, Kalof & Stern, 2002). Due to negative impacts such as environmental degradation and resource exhaustion caused by modern consumption patterns (Witt, 2016), the need for consumption to become more sustainable should be prioritised.

It is said that sustainable consumption is based on a decision making process that takes social responsibility as well as consumers' needs and consumer wants into consideration (Meulenberg, 2003). Everyday consumption practices are driven by numerous factors including consumer habits, the element of convenience and consumer health concerns amongst others (Vermeir & Verbeke, 2006). These practices are known to have inevitable consequences on the environment through climate change as well as consumer health (White, Habib & Hardisty, 2019). Although some consumers seem to have positive attitudes towards positive environmental behaviour, consumers do not always display these positive actions (Auger & Devinney, 2007). A large portion of climate change is placed on habits as consumers everyday activities and diets are mostly habitual (Mazar, Tomaino, Carmon & Wood, 2020). Habit plays a large role in consumers' everyday

activities. When purchasing food products, many consumer habits are unsustainable and breaking a habit is a critical component of sustainable behavioural change (White *et al.*, 2019). Amongst consumers, sustainable food consumption can be deemed as effortful and time-consuming although changes can be made in order to prompt consumers to consume sustainably (Ertz, Durif, Lecompte & Boivin, 2018). An example of this could be for companies to display insightful information regarding health and environmental consequences which may trigger consumers to engage in eco-friendly behaviours (White *et al.*, 2019). Numerous factors such as education and knowledge are linked to a consumer's participation in eco-friendly behaviours (Hernández-Barco, Sánchez-Martín & Corbacho-Cuello, 2021), which is important in order to make a change.

The bakery industry is constantly developing and increasing, resulting in consumers becoming more demanding (Souki, Reis & Moura, 2016). In the bakery industry, it is vital that consumer needs are met. It is important for the baking industry to focus on healthier diets as this factor strongly impacts consumer decisions (Oliveira, Araújo, Kaperavicsuz, Silva & Banderó, 2020). Often, consumers demand foods that are healthier and are of a higher quality (Oliveira *et al.*, 2020). The reason for this is that, consumers notice that various health problems have been caused by poor eating habits therefore they attempt to change their diets accordingly (He & Harris, 2020) . An increase in consumer demand forces the bakery industry to constantly improve and expand their ideas and products (Souki *et al.*, 2016), in order to benefit the environment as well as consumer health. As food habits are dynamic and constantly change according to consumers preferences (Viljoen & Gericke, 2001), these habits that have a negative impact on health and contribute to climate change need to be broken. Viljoen & Gericke (2001) mention that bread and baked products were rated as high preference items and therefore it is important for the bakery industry to provide products that include grains beneficial to health and do not place negative impact on the environment which can satisfy the tastes of consumers.

Consumer behaviour and household current bread consumption significantly contributes to an increase in climate change and inadequate health benefits to consumers. By providing more sustainable bread alternatives on the market, these inevitable consequences may decrease significantly resulting in a higher quality of life. It is essential that consumers are made aware of these detrimental impacts and that consumers are guided to enable them to make better use of bread products in their diets. Numerous

changes can be made across the entire bread supply chain that may result in minimal impact on both the environment and various social aspects.

New market opportunities have risen by making use of climate smart crops to launch bread products in Africa (Aarssen, 2019). These climate smart crops have the ability to manage landscapes and cropland to address sustainability challenges such as food security and climate change (Yamauchi, Noshita & Tsutsumi, 2021). As wheat-bread is rapidly replacing traditional meals in South Africa, most wheat is imported. It is therefore commercially viable to make use of local, climate smart crops (cassava and sorghum) in bread production (Aarssen, 2019).

Chapter 3

RESEARCH DESIGN AND METHODOLOGY

This chapter presents the research design and methodology that was implemented to conduct this study.

3.1 RESEARCH DESIGN

To date very little is known about consumers' engagement with alternative bread products (i.e., non-wheat options that could be viewed as more sustainable). Consumers' preferences and prioritization of selected product attributes when considering bread products is in particular under investigation. For this reason, this study was empirical in nature. Empirical research is usually necessary when investigating a field of interest that was previously unexplored, as was the case with this study.

Decisions regarding the research design and methodology chosen for this study required careful consideration as this study envisaged presenting a holistic scene pertaining to the South African bread market and its respective consumer segments. Akhtar (2016) states that a research design is a conceptual plan and the "glue" that holds all of the elements in a research project together. Because this study had a very specific ideal in mind (i.e., presenting a holistic view) it was decided to structure the research in an explorative – descriptive manner. Exploratory research is inevitable when little information is available about the phenomenon (Fouche & Joubert, 2009), whereas descriptive research is a type of research that is used to describe characteristics of a phenomena and or population (Nassaji, 2015). In this research exploratory research was used to explore the current bread market in SA whereas the descriptive investigation presented information about consumers current and future engagement with bread products.

To ease decisions pertaining to the methodology (and the exploratory – descriptive nature it had to present) the researcher found the assumptions of the Rapid Market Appraisal (RMA) as presented by Wandschneider, Yen, Ferris & Van On, (2012) helpful. In short, an RMA could be summarised as a way in which industry stakeholders collect market information with the aim to identify, develop and or introduce possible new products with

greater success to the consumer market (Wandschneider, Ferris, Lundy & Ostertag). RMAs could therefore be considered as a quick and effective way for collecting, analyzing and reporting results about markets and their respective consumer segments. According to Wandschneider *et al*, (2012), the main principle underlying an RMA is the attainment of a complete vertical perspective (i.e., data collection from multiple points in the value chain is essential). Normally RMA's include seven steps, that resembles the key elements as presented in most research methodologies, commencing with identification of a specific area of study and product of interest, design of measuring instruments, data collection and finally concluding with data analysis and interpretation / reporting. Note that step 3 involves data collection from industry via a Market Quick Scan (MQS) whereas step 4 involves a consumer survey, thus, allowing not only multiple sets of data which is not only a holistic approach but also allows an exploratory-descriptive investigation.

The 7 steps of a RMA as presented by Wandschneider *et al*, (2012) and how it was applied:

Step 1: Area selection

The geographical area needs to be clearly established in order to be specific about where market impact is aimed at being shown. This study took place in Gauteng.

Step 2: Product selection

For the purpose of this study the product was decided prior to the commencement of the study as the research was commissioned by Nutrifoods who specifically asked for data pertaining to the SA bread market.

Step 3: Market Quick Scan and design of a consumer market survey

This step is important as careful planning and preparation generates useful information to analyse the relevant issues at hand. For the purpose of this study a Market Quick Scan (MQS) was used in order to gain relevant insight into the market but to also aid the structuring of the consumer survey which followed in step 4. Initially, a team was responsible for exploring the bread category across key retailers in South Africa, however, due to COVID-19 restrictions the **MQS** had to be supplemented by using online sources (see Addendum C for more detail about the MQS).

Step 4: Implementation of market survey

It is essential to ensure proper data collection when following the steps of the RMA. The quality of the information gathered depends on the ability of the researcher to either interact and or distribute the survey successfully to possible respondents. The method of contact can vary in an RMA from telephone, email or formally by writing. This study made use of an online distribution system, Qualtrics, and the link was shared using a variety of online platforms such as email, WhatsApp, Facebook and LinkedIn.

Step 5: Analysis of data

This step involves the analysis of data in a credible fashion. Data analysis in this study was analysed and interpreted with the assistance of an assigned statistical adviser. (See page 56 for full disclosure about the data analysis).

Step 6: Report writing

This step commenced towards the final stages of the data analysis. The primary investigator was responsible for the final report writing. Some guidance and assistance was provided by academic supervisors and appointed statistical advisers.

Step 7: Analysis to action

This is the final step of the RMA and the basic tools of this step include: Visioning, exchange visits, market visits and identifying chain champions. This study aimed to provide detailed insight about the bread market to respective value chain stakeholders and consumers. It is envisaged that results gained through this study could aid in developing appropriate programs and policies which would promote production and marketing interventions. This would assist relevant industry stake holders (e.g. retailers selling bread) in amending their current market strategies and business plans which may be miss-aligned when considering consumer needs.

Following an exploratory-descriptive approach which is guided by the RMA as proposed above did imply that the research would include two phases. Figure 3.1 demonstrates the research phases of this study using a mixed methods design that was adapted from Creswell (2014:220).

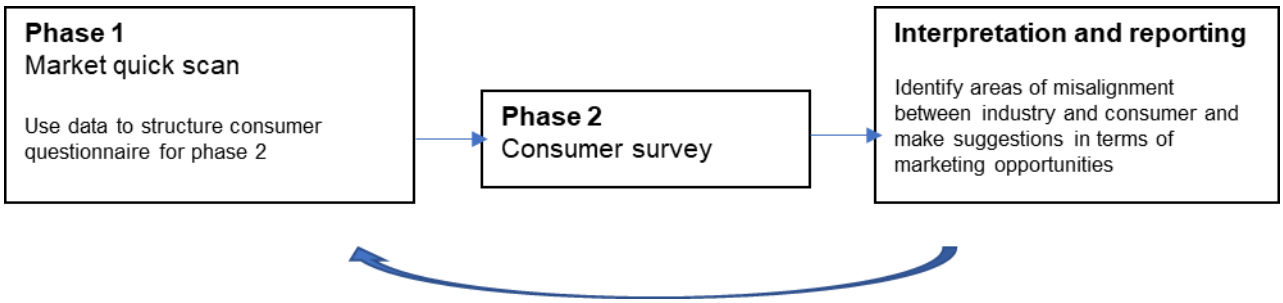

FIGURE 3.1: MIXED METHOD DESIGN, ADAPTED FROM CRESWELL (2014:220)

In short, the data collection as presented in Figure 3.1 could be explained as follows:

Phase 1 included steps 1-3 in particularly the MQS as proposed by the RMA, whereas, Phase 2 included steps 4-7 which mainly focused on the consumer survey and respective reporting. This sequence was essential as the results from the MQS assisted in the development of the consumer survey.

This study relied on the collection of primary data which was collected through mostly quantitative methods (i.e., a Market Quick Scan, in-store observations and lastly a consumer survey). Primary data is data which is collected by the researcher and is aimed at finding a solution to a problem which can be done by making use of surveys and questionnaires (Ajayi, 2017). The study was **cross sectional** in nature, which meant that data was collected from a specific population at a particular point in time (July 2020 to October 2020). Levin (2006) argues that descriptive cross-sectional studies are valuable as it provides data for describing the status of phenomena or relationships among phenomena at a fixed point in time. Hence the results from this study could be thought of as a “snapshot” of the current marketing status and respective consumer behaviour.

3.2 RESEARCH AIMS AND OBJECTIVES

This study firstly aimed to explore the current availability of bread products on the South African market and secondly to identify and describe South African consumers’ preferences and possible willingness to purchase more sustainable bread options (i.e., non-traditional options made from climate smart crops).

The objectives of the study are as follows:

Objective 1: *To explore and describe the current South African bread market.*

- Objective 1.1: To explore and describe which type of bread products are currently available to urban South African consumers.
- Objective 1.2: To explore current market and consumer trends that drive consumer's bread selection.

Objective 2: *To explore and describe consumers' current purchasing behaviour and preferences pertaining to bread products.*

- Objective 2.1: To explore and describe consumers' current purchasing practices (i.e., categories, assortment, brand, patronage of retailers and number of servings) in terms of current available bread options.
- Objective 2.2: To explore and describe consumers' preferences (i.e., categories, assortment, brand, patronage and number of servings) in terms of bread products.
- Objective 2.3: To explore and describe consumers' prioritisation of selected intrinsic (characteristics such as taste, visual appearance, texture, aroma, food safety, nutritional value, processing/ production method and ingredients) and extrinsic (store image, price, brand, packaging and label) product attributes when selecting preferred bread options.

Objective 3: *To identify possible market opportunities for alternative bread options*.

- Objective 3.1: To explore urban South African consumers' willingness to purchase non-traditional/ innovative bread alternatives that could be deemed as more sustainable.

3.3 METHODOLOGY

The following section will present the methodology that was followed in order to achieve the objectives formulated for this study. Note that because the study followed a two phased approach, differences in terms of the method followed in each of the phases will be presented accordingly.

3.3.1 Study areas and unit of analysis and sampling

The unit of analysis refers to who the study is analysing and investigating (Lefstein, Snell & Israeli, 2015). A population is a specific group of individuals who have similar characteristics (O. Nyumba, Wilson, Derrick & Mukherjee, 2018). The population of the study at hand included consumers residing in Gauteng, South Africa.

3.3.1.1 PHASE 1: Market Quick Scan

For the first phase of the study, retail stores in close proximity to the University of Pretoria were investigated (i.e. Checkers Loftus Park, Woolworths Hilcrest Boulevard, Dischem Hilcrest Boulevard, Kwikspar Groenkloof and Pick n Pay Hilcrest Boulevard). Due to the onset of COVID-19 and the restrictions that was in place during the pandemic the MQS had to be amended to include an online investigation. This could be viewed as a positive result as it broadened the analysis thus giving a more detailed idea of product availability across the key retailers.

3.3.1.2 PHASE 2: Consumer survey

In the second phase of the study, the unit of analysis for the consumer survey consisted of consumers residing in Gauteng, 21 years and older who are responsible for purchasing groceries or who are the primary decision makers in their household. The study included both adult male and female respondents. No restrictions were placed in terms of population group, income or education level. The procedure of collecting data was managed by the primary researcher who took the responsibility for recruiting suitable respondents for the study by carefully monitoring the distribution of the questionnaire.

3.3.2 Sampling technique

Representation of a population by making use of a subset is termed sampling (Etikan, Musa & Alkassim, 2016). A sample is often used as it is not always possible to study an entire population. By using a sample, researchers can reduce costs and minimise the time taken to complete the research (Acharya, Prakash, Saxena & Nigam, 2013). There are numerous types of sampling techniques which may be categorised into probability and non-probability sampling methods (Schreuder, Gregoire & Weyer, 2001).

3.3.2.1 PHASE 1: Purposive sampling

In phase one of this study, a non-probability purposive sampling technique was used. Purposive sampling, also referred to as judgement sampling, relies on the deliberate selection of an informant due to the various qualities that the informant possesses (Tongco, 2007). The primary researcher of this study decided which information needed to be known and set out to find suitable retailers/ online platforms to gain the relevant information (Bernard, 2002). Retail stores under observation were selected due to their close proximity to the University of Pretoria. These stores were Checkers Loftus Park, Woolworths Hilcrest Boulevard, Dischem Hilcrest Boulevard, Kwikspar Groenkloof and Pick n Pay Hilcrest Boulevard. These retailers were selected as they may be considered key retailers in South Africa (Van der Walt, 2016). Each retailer makes use of an online store which was then observed and analysed due to COVID-19 restrictions.

3.3.2.2 PHASE 2: Convenience sampling and snowballing

A convenience non-probability sampling method and snowballing was used to gain insight on the topic in the second phase of the study. A convenience sampling technique is used when sampling units are selected on a foundation of convenience or where members of the population can meet certain criteria that is practical (Etikan *et al.*, 2016). This method involved the selection of respondents with specific characteristics that were viable to represent the South African population as a whole. In research, it would be preferred to use the whole population, although, this is not possible as the population is almost finite (Etikan, 2016). A Snowballing sampling technique was used to further recruit additional participants from respondents that were already identified and selected to participate by the primary investigator. Fortunately, the advantage of these types of sampling methods are the accessibility and speed with which data can be collected within financial limitations such as the study on hand (Byrne, 2001). This makes the selected sampling techniques ideal for this study as the constraints were time, accessibility and finance. Initially it was advised to collect information from 350 respondents across the Gauteng area, however, the survey managed to canvas more than 1800 participants. The distribution of the online consumer survey took place during July 2020 to October of 2020. The link that was generated and shared via Qualtrics was distributed through numerous online and social media platforms including WhatsApp, Facebook, LinkedIn as well as via email. A total of 1878 questionnaires were ultimately recorded.

3.4 MEASURING INSTRUMENT AND DATA COLLECTION

3.4.1 PHASE 1: Market Quick Scan

During the MQS 10 trained field workers assisted with data collection. Each field worker was tasked to visit a particular retailer and analyse the bread category in terms of the width and depth of the assortment available. Notes had to made about the specific brands, pricing, current trends as well as the availability of non-traditional bread options i.e., alternative grains, flat breads, gluten free etc. (Addendum D).

As phase two was dependent on the information collected during phase one extra care was taken to ensure that data was collected in a responsible fashion.

Please refer to addendum D for the field worker brief which they had to complete during the MQS. In short, this check sheet not only guided the field workers to effectively collect data but also ensure that the data collection process was uniform across all stores.

3.4.2 PHASE 2: Consumer survey

This phase entailed the 4th step in the RMA where the survey was implemented during phase two, an online consumer survey was implemented to provide quantitative information pertaining to consumers' current purchasing practices as well as their preferences with regard to bread products. Additionally, the questionnaire tested consumers' prioritisation of intrinsic and extrinsic characteristics when selecting preferred options. In conclusion the questionnaire collected information in an attempt to measure consumers' willingness to adopt alternative options that could be deemed as more sustainable.

The survey consisted of a self-administrated electronic questionnaire that was distributed through email as well as other social media and other online platforms. Qualtrics, an online survey tool was used to generate a link and collect and store the data for this study. The advantages of online surveys include fewer mistakes, they are cost-effective, and they tend to be quicker than paper written surveys.

The sections of the measuring instrument were as follows:

TABLE 3.1: CONSUMER SURVEY SECTION DESCRIPTION

Section description	
Section A	This section aimed at collecting general demographic data that aided in profiling the sample in terms of specific demographic characteristics. It sought to investigate the respondents' gender, age, population group, level of education, area of residence, home language, income, and marital status. Additionally, this section investigated the number of people per household, who is responsible for grocery shopping and how many times bread products are purchased per month
Section B	This section investigated respondents' preferences when buying and consuming bread products. This section explained that consumer preferences are often different from their actual buying patterns. A five-point Likert-type scale measured the level of preference and statements were coded from one to five where one indicated "prefer a great deal" and five indicated "do not prefer". The statements included reflected product lines and assortments that were identified during phase one.
Section C	This section investigated the respondents' actual buying and consumption behaviour. A five-point Likert-type scale was used to measure the actual buying behaviour of respondents where one indicated "always" and five indicated "never". The questions in section B and C were similar, however, they were created to measure actual consumption and not the preferences of the respondents. Once again the statements included reflected product lines and assortments that were identified during phase one.
Section D	This section aimed at investigating the level of importance that product related attributes play when selecting preferred bread products. Firstly, a five-point Likert-type scale was used to measure the importance of various product related attributes prioritised by respondents where one indicated "not important at all" and five indicated "absolutely essential". Secondly, respondents were asked to rank various product attributes in terms of importance from one to eight. One indicated most important and eight indicated least important.
Section E	This section investigated how likely respondents are to purchase and consume alternative bread options that could be deemed as more sustainable because they are produced from climate smart crops such as sorghum, cassava, rice, wheat-free. A five-point Likert-type scale was used, one indicating "extremely likely" and five indicating "extremely unlikely".

The questionnaire was available in English as this was found to be the most popular/ understood language amongst the sample. A cover letter was attached to the questionnaire which stated the purpose of the study, the aim, and explained some key constructs relevant to the study. Respondents were made aware of the time it would take to complete the survey and that the completion of the survey was voluntary. The cover letter additionally explained that the answers would be kept anonymous.

Pilot testing of the instrument (consumer survey) was done prior to sending the link out to potential respondents. This was done by sending out the final survey to 60 respondents who reflected the characteristics required from the final sample. This was done to identify any discrepancies and confusion that was identified. The survey was altered accordingly before sending out the final link.

3.5 DATA ANALYSIS

Data analysis is the application of thought to comprehend sets of data collected for a study (Salkind, 2014). The methods of analysis are described as follows:

3.5.1 PHASE 1: Market Quick Scan

Analysis of the Market Quick Scan was completed by firstly evaluating online retail stores. Once this data was observed and recorded, the information was translated into a combined data set according to which bread products and market trends were observed in each store. The analysis during this phase involved mostly descriptive statistics as the data was presented in terms of means, percentages and frequencies (Salkind, 2014).

3.5.2 PHASE 2: Consumer Survey

By making use of the Qualtrics software, the data was coded and transferred to statistical software (SPSS, 2.1). The statistical analysis included descriptive statistics of the quantitative data. Descriptive statistics are used to summarize data by describing the relationships between variables of a sample of population, this is done in an organised manner (Yellapu, 2018). The mean, median and mode as well as the variance, standard deviation and range could be determined from the Qualtrics software. The data was presented in graphs and frequency tables which made the data easy to read and easy to pinpoint important relevant information. In order to identify possible significant differences pertaining to consumers prioritisation of attributes data in section D was subjected to ANOVA's and subsequent post-hoc tests.

3.6 OPERATIONALISATION AND CONCEPTUALISATION

The operationalisation of the measures was done in terms of the objectives and sub-objectives of the research study. Table 3.2 indicated the objectives for this study along with the dimensions, indicators and types of statistical methods used.

TABLE 3.2: OPERATIONALISATION TABLE

Construct	Dimension	Indicator	Sub Objectives	Data collection	Measurement	Data analysis
Objective 1: To explore the current availability of bread products on the market for urban South African consumers						
Bread products	Availability	**Availability of Bread:** Categories/ assortments/ lines - brands, various characteristics, retail stores	To explore and describe which type of bread products are currently available to urban South African consumers	Online & physical retail store observations	Market Quick Scan	Descriptive statistics
	Market trends	**Trends amongst bread products:** Health, convenience and pleasure	To explore current market and consumer trends that drive consumer's bread selection	Online & physical retail store observations	Market Quick Scan	Descriptive statistics
Objective 2: To identify and describe urban South African consumers preferences and possible willingness to purchase more sustainable bread alternatives.						
SA consumers	Consumers preferences	**Current preferences of consumers:** Categories, assortment, brand, patronage of retailers and number of servings	To explore and describe consumers' preferences in terms of bread products	Questionnaire	Section B Question 16 – Question Q22	Percentages and descriptive statistics
	Consumer current purchasing practices	**Current purchasing practices:** Categories, assortment, brand, patronage of retailers and number of servings	To explore and describe consumers' current purchasing practices in terms of current available bread options	Questionnaire	Section C Question 23 – Question 29	Percentages and descriptive statistics
	Product attribute prioritisation	**Level of importance of:** **a) Intrinsic factors** Taste, visual appearance, texture, flavour/ aroma, food safety, nutritional value, processing/ production method and ingredients **b) Extrinsic factors** Store image, price, brand, packaging and label	To explore and describe consumers' prioritisation of selected intrinsic and extrinsic product attributes	Questionnaire	Section D Question 30, 31, 32	Descriptive statistics and ANOVA
Objective 3: To identify possible market opportunities for alternative bread options: To explore urban South African consumers' willingness to purchase non-traditional/ innovative bread alternatives that could be deemed more sustainable.						Descriptive statistics

3.7 QUALITY OF DATA

To ensure that the findings derived from this study could be used in future literature, it is important to refer to the quality of the study. Quality of data determines the success of the research as well as the publishing ability. It is important to address the quality of the research design and methodology as well as the validity and reliability of the measuring instrument**.** Validity can be defined as the extent to which a concept is accurately measured in a study says Heale and Twycross (2015). Additionally, validity is the extent to which a measure truthfully represents a concept of a research project that is described as unique (Zikmund, Babin, Carr & Griffin, 2010). In this research project validity needs to be established. Reliability indicates a measures internal consistency and dependability to which the research can be repeated and still obtain the same results (Zikmund *et al.*, 2010).

The following measures were taken to limit errors that might obstruct the validity and reliability of the data.

3.7.1 Measuring validity

Validity when referring to a research study refers to the accuracy, meaningfulness and the credibility of the study as a whole. Research is only valid when conclusions from the data are justifiable and meaningful. There are three major types of validity according to Heale and Twycross (2015).

3.7.1.1 Content validity

Bollen (1989) defines content validity as a qualitative form of validity that evaluates whether or not expressions in the measuring instrument represent the phenomenon that was intended to be measured. Content validity looks at whether an instrument sufficiently covers all of the relevant content that it should with respect to the variable being measured (Heale & Twycross, 2015).

In this study, content validity was performed by theoretically defining all the relevant concepts and the dimensions of the study. This type of validity thus refers to the means of measurement, and represents all possible questions needed to investigate the problem

at hand, in order to find a suitable solution. The Market Quick Scan, as well as the consumer survey represented all the relevant questions that need to be answered in order to investigate the problem at hand. Additionally, content validity was achieved in this study by receiving ethical clearance of the research problem as well as the methodology through the panel of experts from the Faculty of Agriculture and Natural Sciences at the University of Pretoria.

3.7.1.2 Face validity

Face validity is a subset of content validity (Heale & Twycross, 2015). It implies that a test (in a practical situation) should appear as practical, additionally to being valid in itself (Nevo, 1985). The study at hand achieved face validity as the measuring instrument displayed clear wording, the layout and style was appropriate and in addition, the measuring instrument was displayed in a way that it was likely that the target audience would be able to answer the questions. The concepts and instrument were structured in a way that not only to measure the relevant attributes accurately, but also to appear as a relevant measure of the problem at hand.

3.7.1.3 Construct validity

Construct validity refers to whether or not the researcher is able to draw inferences from the results that are related to the concept being studied (Heale & Twycross, 2015). This type of validity is concerned with the degree to which the instrument measures the relevant concept, idea or quality that it proposes to measure (Sürücü & Maslakçi, 2020). In this study, construct validity was achieved by an extensive review of the relevant literature and scale items which were adapted from published studies that presented similar characteristics.

3.7.2 Measuring reliability

Reliability relates to the consistency of measure where any research tool used in a study should provide the same information if used by different people or at different times (Roberts & Priest, 2006). Reliability in other words is the extent to which research is truthful, honest and reasonable. This research was reliable as each item measured one concept individually. A pilot test was conducted on a smaller set of respondents prior to

distributing the final consumer questionnaire. The purpose of this was to identify any problems or discrepancies which may have been unclear to the respondents. By doing this, the feasibility as well as the duration of the study was tested to ensure that the final data collection was completed reliably.

3.7.3 Ethics

Ethics in research may be referred to as doing what is morally and legally correct in a research study (Parveen & Showkat, 2017). It is essential that researchers take care of various ethical issues at different levels of their research project. This research study took various measures to ensure that ethical behaviour was carried throughout the study. Numerous steps were taken to ensure an ethical approach towards the study. The cover letter was attached to the beginning of the questionnaire which stated the aim of the study and assured participants of their confidentiality. Confidentiality was further preserved as no personal information or personal details of the respondents were required. The highest possible technical standards were maintained by the researcher during the study. The results of the data were not changed. Participants received consent forms prior to completing the online consumer survey, therefore they did so voluntarily. Since the research involves numerous human respondents, ethical considerations needed to be addressed. Ethical consideration was taken into account by ensuring that participants were not mislead in any way when completing the questionnaire. Consent and confidentiality need to be addressed before the questionnaire was completed by the respondents. These aspects were present in the online survey and the consent form was approved by the Ethics Committee of the Natural and Agricultural Faculty of the University of Pretoria. The study was cleared through the University of Pretoria's Ethics Committee with the reference number: (NAS108/2020) (Addendum C).

Chapter 4

RESULTS AND DISCUSSION

This chapter presents the results and discussion according to the objectives formulated for this study. The chapter will commence by not only describing the sample in terms of demographic characteristics but also highlighting key aspects pertaining to the current South African bread market (i.e., availability and trends (Objective 1)). Results following on this will include an explication of the samples' purchasing and preferences pertaining to bread products (Objective 2). In conclusion possible market opportunities for alternative bread options will be discussed (Objective 3).

4.1 THE DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

The selected demographic characteristics that were considered which were deemed relevant to the investigation at hand were included in Section A of the questionnaire. The gender, age, population group, level of education, area of residence, home language, household income, marital status, household size and the composition of the household were collected as seen in Table 4.1. to provide a profile of the data sample.

TABLE 4.1: DEMOGRAPHICS - DEMOGRAPHIC CHARACTORISTICS OF THE SAMPLE (N=447)

Dimension	Frequency	Percentage
Gender		
Male	176	39,4%
Female	270	60,4%
Other	1	0,2%
Age		
18-24 (GEN-Z)	190	42,5%
25-40 (MILLENIALS)	155	34,7%
41-56 (GEN-X)	79	17,7%
57-75 (BOOMERS)	23	5,1%
Population group		
Black African	215	48,1%
Indian/ Asian	15	3,4%
Coloured	6	1,3%
White	211	47,2%
Highest level of education		
Lower than Grade 12	20	4,5%
Grade 12 completed	226	50,6%
University completed	120	26,8%
Postgraduate completed	81	18,1%
Home language		
English	160	35,8%

Dimension	Frequency	Percentage
isiZulu	44	9,8%
Afrikaans	107	23,9%
Sepedi	44	9,8%
Sesotho	15	3,4%
Setswana	24	5,4%
siSwati	10	2,2%
Tshivenda	7	1,6%
Xitsonga	14	3,1%
isiNdebele	4	0,9%
isiXosa	18	4,0%
Monthly household income		
<= 6000.00	111	24,8%
6001.00 – 10000.00	26	5,8%
10001.00 – 20000.00	54	12,1%
20001.00 – 30000.00	48	10,7%
30001.00 – 50000.00	90	20,1%
50001.00 – 70833.33	40	8,9%
Missing values	78	17,4%
Marital status		
Single/unmarried	306	68,5%
Married/ living with a partner	122	27,3%
Divorced/ widowed	16	3,6%
Missing values	3	0,7%
Household size		
1	54	12,3%
2	88	19,7%
3	83	18,9%
4	82	18,3%
5	61	13,6%
6 and more	71	15,9%
Missing values	8	1,8%
Number of children		
0	105	23,5%
1	76	17%
2	87	19,5%
3	51	11,4%
4	20	4,5%
More than 5	9	5,8%
Missing values	82	18,3%

4.1.1 Gender

Gender was included in the study as diverse gender groups may display differences when selecting and consuming food products (Godwin & Chambers IV, 2009). Respondents were asked to indicate their gender in a multiple-choice question where they could select male, female or other. Results indicated that majority of the sample was female (60,4%; n=270) compared to 39,4% male (n=176). This split was favourable in terms of representativeness and is a positive outcome as it is noted that in South Africa, females are still typically the primary grocery shoppers of their respective households and are

often responsible for food decisions which include the purchasing and preparation of food (Odunitan-Wayas, Okop, Dover, Alaba, Micklesfield, Puoane, Uys, Tsolekile, Levitt & Battersby, 2018). With this being said, women are therefore deemed as more influential when it comes to their family's bread preferences and consumption behaviour and hence their insight are valuable.

4.1.2 Age

Amongst various demographic variables, age may have an influence on food choice behaviour i.e., willingness to try and accept new food products (Ares & Gámbaro, 2007). The respondents were asked to indicate their current age by answering a sliding scale question where the minimum age indicated was 21 and the maximum age was 65. The inclusion of these respondents formed part of the selection criteria as these consumers were viewed as more likely to be frequent consumers of this product due to their age and current life cycle. These consumers are likely to be involved in regular food purchasing and consumption decisions through interaction with products and situations which influence their buying behaviour (Slama & Tashchian, 1985).

The respondent's age was divided into four generational cohorts: Generation-Z; Millennials; Generation-X and Baby Boomers. This cohort theory was introduced by Karl Mannheim (Mannheim, 1952), this theory explains that people who live through shared experiences share common preferences and behaviours through life (Koksal, 2019). Results indicated that Generation-X (age 18-24) was mostly represented in the sample (42,5%; n=190). Closely followed by Millennials (age 25-40) (34,7%; n=155). The remainder of the sample included Generation-Y (age 41-56) 17,7% (n=79) and Baby Boomers (age 57-above) representing 5,1% (n=23). This age distribution is a similar representation of the South African population (Statista, 2021a). Different generational cohorts can influence many factors with regard to preferences and consumption (Eger, Komárková, Egerová & Mičík, 2021). In a study done by Lădaru, Siminică, Diaconeasa, Ilie, Dobrotă and Motofeanu (2021), significant differences in bread preferences were identified amongst age categories. In this study it was identified that older categories consumed more bread than the younger groups (Lădaru *et al.*, 2021).

4.1.3 Population group

Emami and Sobhani (2020) noted that ethnicity (i.e., population group) has an influence on consumers' consumption and preferences of food products. Respondents were asked to indicate the population group that they belong to in a multiple-choice question that was based on the guidelines presented in the Employment Equity Act No.55 of 1998. The results indicated that almost half of the sample was African (48,1% n=215), with the remainder split between - white (47,2% n=211), Indian/ Asian (3,4% n=15) and coloured (1,3% n=6). Although this split is not completely representative of the South African Population (Statista, 2021b) the inclusion of 48,1% African respondents can still aid in an accurate representation of South Africa since a large majority of the population group are African.

4.1.4 Level of education

Moreira and Padrão (2004), noted that education is useful to explain food behaviour and choices pertaining to aspects such as nutrition. In this study, respondents were asked to provide their highest level of education in a multiple-choice question. Table 4.1 presents that half of the respondents' completed Grade 12 (50,6% n=226), followed by (26,8% n=120) who have completed tertiary education and (18,1% n=81) have completed a postgraduate degree. Only 4,5% of the sample (n=20) indicated that they did not complete school. Compared to the South African population, this sample presented a more formal/ higher level of education (Statista, 2020a).

4.1.5 Home language

Language influences many aspects including how consumers process and access information on labels which many impact food choice (Swahn, Mossberg, Öström & Gustafsson, 2012). Respondents were asked to indicate their home language in the questionnaire from a multiple-choice question. As seen in Table 4.1, most of the respondents' home language was English (35,8% n=160). 23% of respondents selected Afrikaans as their home language (n=107), 9,8% of respondents speak isiZulu and Sepedi (n=44), 5,4% speak Setswana (n=24), 4% speak isiXosa (N=18), 3,4% speak Sesotho (n=15) and 3,1% speak Xitsonga (n=134). The remaining respondents selected

siSwati as their home language which made up 2,2% (n=10), Tshivenda 1,6% (n=7) and iaiNdebele 0,9% (n=4).

4.1.6 Average monthly household income

Gül, Isik, Bal and Ozer (2003) notes that as income fluctuates, so does the consumption of bread. Additionally, Gül *et al.* (2003) mentions that income has the ability to influence food preferences and food habits. Respondents were asked to specify their approximate total monthly household income. This question was presented as a sliding scale question rounded up to the nearest R1000. Due to the sensitive nature of the question, consumers were not forced to respond. As seen in Table 4.1. 24,8% of respondents fell into the lowest income group in South Africa where n=111. 5,8% of the sample fell within the second lowest group and 12,1% fell within the emerging middle classification. In terms of the realised middle and emerging affluent income groups figures respectively included 10,7% and 20,1% with 8,9% of the respondents falling within the highest income group.

4.1.7 Marital status

Marital status has an impact on food consumption (Deshmukh-Taskar, Nicklas, Yang & Berenson, 2007). Marriage and family dynamics has been thought to contribute to living conditions and food consumption due to sharing of household goods and income (Deshmukh-Taskar *et al.*, 2007). Respondents were asked to indicate their marital status through a multiple-choice question. As seen in table 4.1, more than half of the respondents indicated that they are single/ unmarried (68,9% n=306). The remaining respondents are married/ living with a partner (27,5% n=122) and only 3,6% (n=16) were divorced or widowed.

4.1.8 Household size

Smallwood and Blaylock (1981) noted that household expenditure on bread increases slightly with income but are more responsive to the changes in a household's size. Respondents were asked to indicate the number of people living in their respective household by answering a sliding scale question. Table 4.1 presents the results and indicated that the household size most prevalent amongst this sample was two-persons household 20% (n=88). This was followed by 18,9% (n=83) of respondents living in a

household of three people (n=18,9) or four people (18,7% n=82). The remainder of the sample were split amongst larger household size i.e., households that include 5 people (13,9% n=61) and more people (16,2% n=71), and single person households (12,3% n=54). Compared to online data, this sample seemed to be in line as in South Africa, the current distribution of households mostly consisted of 2-3 people (37,3%), 4-5 people (25,1%), 1 person (23.4%) and 6 or more people (14,2%) (Statista, 2020b).

4.1.9 Household composition

Family structure including the presence of children in the household have the ability to influence food decisions and food preferences (Dammann & Smith, 2009; Smallwood & Blaylock, 1981). For this reason, respondents were asked to indicate the number of dependent children currently living in the household. A sliding scale question was implemented to answer this question. As seen in Table 4.1, 28,8% of respondents did not have any children (n=105). Results pertaining to those that did have children presented that 20,8% (n=76) had one child and 23,8% (n=87) of respondents had two children, 14% (n=51) had three children and 12,6% (n=46) had 4 or more children.

4.2 RESULTS

The following discussion is guided by the objectives formulated for the study. Section 4.2.1 starts by providing an overview of the results pertaining to Objective 1 (phase 1: the Market Quick Scan - MQS) that aimed at exploring the current South African bread market in terms of availability and visible trends. This is followed by section 4.2.2 presenting findings pertaining to Objective 2 (phase 2: consumer survey) consumers' current purchasing practices and preferences regarding bread products. This section also includes the identification of product attributes (intrinsic and extrinsic) that is prioritised by the respondents. It is hoped that the latter which also include ANOVA's will allow for better product development, assortment planning, consumer segmentation and ultimate consumer satisfaction. Results are concluded in section 4.2.3 which presents findings pertaining to possible market opportunities for alternative bread options and consumers' willingness to adopt these alternatives.

It should be noted that the data for this study was collected during July 2020 to October of 2020, which fell within the South African COVID-19 nationwide lock-down under levels 4 and 5. During this time consumer movement and ultimately spending was restricted which could have had an influence on not only the data collection but also the respective results.

4.2.1 The current South African bread market (objective 1)

The trading of bread is not a new phenomenon and literature indicates that this commodity might have been one of the first products to be sold (Bobrow-Strain, 2012). Furthermore it is important to note that wheat is not the only grain/ ingredient used to produce bread as the development of bread has taken different directions in various parts of the world, resulting in various trends (Cauvain, 2015). In order to investigate the current situation pertaining to bread in South Africa, this product category was explored during phase 1, the MQS. Focus was particularly aimed at product availability in terms of assortment, brands and underlying trends.

The MQS included both in-store and online observations. Five retail stores were included (Checkers Loftus Park, Woolworths Hilcrest Boulevard, Dischem Hilcrest Boulevard, Kwikspar Groenkloof and Pick n Pay Hilcrest Boulevard). These stores were selected as most of them tend to stock bread as one of their primary product categories and is hence often frequented by consumers for the purpose of buying items from this category i.e., some sort of bread product.

Data analysis included descriptive statistics which allowed for the presentation of the results in terms of frequency tables and where relevant graphs. Table 4.2. presents not only the assortment of bread products available across prominent retailers (Objective 1.1) but also highlights the category captains and consumers trends visible (Objective 1.2).

TABLE 4.2: BREAD AVAILABILITY AND TRENDS - BREAD AVAILABILITY AND TRENDS PRESENTED BY PROMINENT SOUTH AFRICAN RETAILERS

			Retailers				
Consumer trends	**Category captains**	**Assortment**	**Checkers**	**WW**	**Spar**	**PnP**	**Dischem**
Convenience	Regular Wheat (White and Brown) & Convenience	Sliced	✓	✓	✓	✓	×
		Unsliced	✓	✓	✓	✓	×
		Rolls & Buns	✓	✓	✓	✓	×
		Freshly baked	✓	×	✓	✓	×
		Heat & eat	✓	✓	✓	✓	×
Pleasure	Artisan	Ciabatta	✓	✓	✓	✓	×
		Sourdough	✓	✓	✓	✓	×
		Seeded	✓	✓	✓	✓	✓
		Rye	✓	✓	✓	✓	✓
Health and wellness	Multigrain	Sliced	✓	✓	✓	✓	✓
		Unsliced	✓	✓	✓	✓	×
		Rolls & Buns	✓	✓	✓	✓	×
	Health & Wellness	Gluten Free	✓	✓	✓	✓	✓
		Flat breads (Wraps, Naan Bread & Pita)	✓	✓	✓	✓	×
		High fiber	✓	✓	✓	✓	✓
		Low GI	✓	✓	✓	✓	✓
		High Protein	✓	✓	✓	✓	✓

From the results presented in Table 4.2 it is evident that most of the retailers are well stocked in terms of assortment (Objective 1.1). The only retailer lacking in this aspect was Dischem which tends to fit the retail characterization of a pharmacy better, whereas the rest of the stores tend to be characterized and well known as general food retailers. Dischem did however present a wide array of health and wellness bread products and flours. For this reason, they should be considered when placing new alternative and innovative bread products. A noticeable factor that might be contributing to the inclusion of a broader bread assortment in the more popular food retailers might have been the fact that these retailers have an in-house bakery (Pick n Pay, Checkers and Kwikspar). It is noticed that an in-store bakery not only allows customers to benefit from freshness and aroma of freshly baked bread but it often allows retailers to be more adventurous with this product category (Mbindo, 2016).

In a study done by Singleton, Li, Duran, Zenk, Odoms-Young and Powell (2017), it was noted that with regard to bread availability, stores offered a large variety of white bread and little to no health bread options. Compared to Singleton *et al*, (2017) this study

presented that although there were a variety of white bread options available, there were also numerous health and wellness and multigrain options available in the major stores. Results are presented in Table 4.2. The high prevalence of more health and wellness options could also be attributed to the fact that consumers are becoming more concerned about their health and wellness. This is particularly true during the pandemic (He & Harris, 2020).

In a study done by Martínez-Monzó, García-Segovia and Albors-Garrigos (2013), it was mentioned that basic trends in bread are related to convenience, pleasure and health. In terms of visible trends amongst the selected South African retailers this study's results (Objective 1.2) confirmed the presence of the three main trends as identified by Martínez-Monzó's study. Recent studies noted that trends are valuable in terms of launching new products and that packaging and promotional material should be harnessed to attract consumer interest (Nair & Abraham, 2017).

4.2.2 Consumers' purchasing patterns and preferences pertaining to bread products (objective 2)

In South Africa, bread is one of the most commonly consumed staple foods (Steyn, Wolmarans, Nel & Bourne, 2008). This is due to bread being ready-to-eat, easily accessible and convenient for customers (Joynt, 2019). Consumers' need for primary staples such as bread have created a highly competitive but stable market environment (Jayne, Mason, Myers, Ferris, Mather, Sitko, Beaver, Lenski, Chapoto & Boughton, 2010). For new products longing to enter this market, it is essential to understand how the current target market purchases and consumes current product options (Ratneshwar, Shocker, Cotte & Srivastava, 1999). This section presents detail pertaining to consumers' purchasing, consumption (Objective 2.1) and preferences (Objective 2.2) pertaining to available bread options.

It should be noted that the data for this study was collected during July 2020 to October of 2020, which fell within the South African COVID-19 nationwide lock-down under levels 4 and 5. During this time consumer movement and ultimately spending was restricted.

4.2.2.1 Consumers' purchasing and general consumption of bread products (objective 2.1)

To investigate current purchasing and consumption practices of bread, respondents were first and foremost asked to indicate their purchase frequency as well as the primary shopper responsible for buying bread in their households. To deepen the understanding of their behaviour, respondents were then prompted to indicate specific details pertaining to their consumption and purchasing patterns by means of 5 matrix questions in Section C. Each matrix question was formulated to reflect selected dimensions presented by, but also relevant to industry namely purchasing of category captains, assortment (line extensions), brands, retailer and serving sizes. Respondents were asked to rate each of the scale items pertaining to the dimensions on a 5 point Likert-type scale where 1=never and 5=always.

Data analysis included basic descriptive statistics and results are presented in terms of percentages and means.

Respondents' purchase frequency of bread products

TABLE 4.3: PURCHASE FREQUENCY RESPONDENTS' PURCHASE FREQENCY OF BREAD PER MONTH (N=447)

Purchase frequency	N	%
0 times	1	0%
1-5 times	187	42%
6-10 times	115	26%
11+ times	142	32%
Missing	2	0%

In many households, bread may be used as a convenient and versatile filler where it is often consumed for breakfast, lunch and supper (Moula, 2006). With this statement in mind it is important to note that bread purchases are mostly habitual and planned which is characterised by low involvement and little to no risk associated with these products (de Wijk, Maaskant, Polet, Holthuysen, van Kleef & Vingerhoeds, 2016). In order to investigate the sample's bread purchase frequency, respondents were asked to specify how many times per moth they purchase bread products on a sliding scale question.

As seen in Table 4.3 the results revealed that almost half, 42% of respondents tend to buy bread products at least once a week (1-5 times a month). 26% of respondents purchase bread products 6-10 times a month (equating to twice a week) and 32% of respondents purchase bread more frequently per month.

Primary shopper

To investigate the primary target market of bread products for South African retailers, respondents were asked to indicate the primary individual (household member) responsible for buying bread. As seen in Table 4.4. 59% of respondents indicated that they, themselves were responsible for buying grocery items such as bread (n=263).

TABLE 4.4: PRIMARY SHOPPER - PRIMARY SHOPPER (N=447)

Possible shopper	N	Frequency
Myself	263	59%
Spouse/partner	33	7%
Sibling/ roommate	20	4%
Missing	63	14%

Trends demonstrate that more females complete the grocery shopping in South African households (Dlamini & Barnard, 2020). It was decided to analyse the data further in particularly the “myself” responses (n=263) see Table 4.2. This analysis indicated that 66% of the sample which responded myself were female (n=174), confirming that many South African households still conform to traditional household roles. Only 34% of the total respondents responsible for their own shopping were male (n=89).

Bread categories purchased

Product categories are collections or groups of products which meet similar or the same consumer needs (Murphy & Enis, 1986). Consumers purchase bread products according to various category captains. To investigate the most popular bread categories purchased by the sample, respondents were asked to indicate which bread categories/ category captains they currently buy.

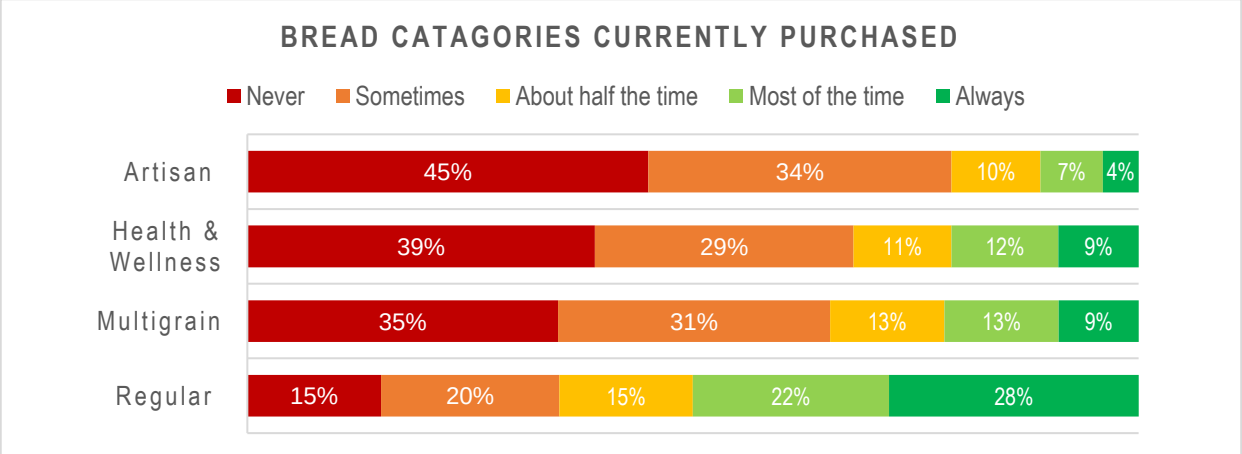

FIGURE 4.1: BREAD CATEGORIES CURRENTLY PURCHASED

Figure 4.1. presents that the bread category mostly purchased by the sample is the regular wheat bread options (50%) i.e., traditional white and/ brown bread. Alternative bread categories (which are also deemed as "healthier" options) seemed to be purchased less by the sample. Results pertaining to these categories indicated that bread products from the Multigrain and Health & Wellness categories present similar purchasing patterns (i.e., 22%-21%), whereas products from the artisanal range are bought the least (only 11%). Possible reasons for these purchasing trends could be attributed to the fact that products such as artisanal breads are not widely available or expensive in all stores.

Bread assortments purchased

Retailers offer a variety of products to consumers in order to meet consumer needs and wants which additionally increases the retailers chances of better sales and the ultimate competitive advantage (Arslain, Gustafson & Rose, 2021). To investigate which bread assortments are currently purchased by South African consumers, respondents were asked to indicate which assortments (lines and types) they currently buy. The product assortment in this study can also be viewed as the product depth per category captain.

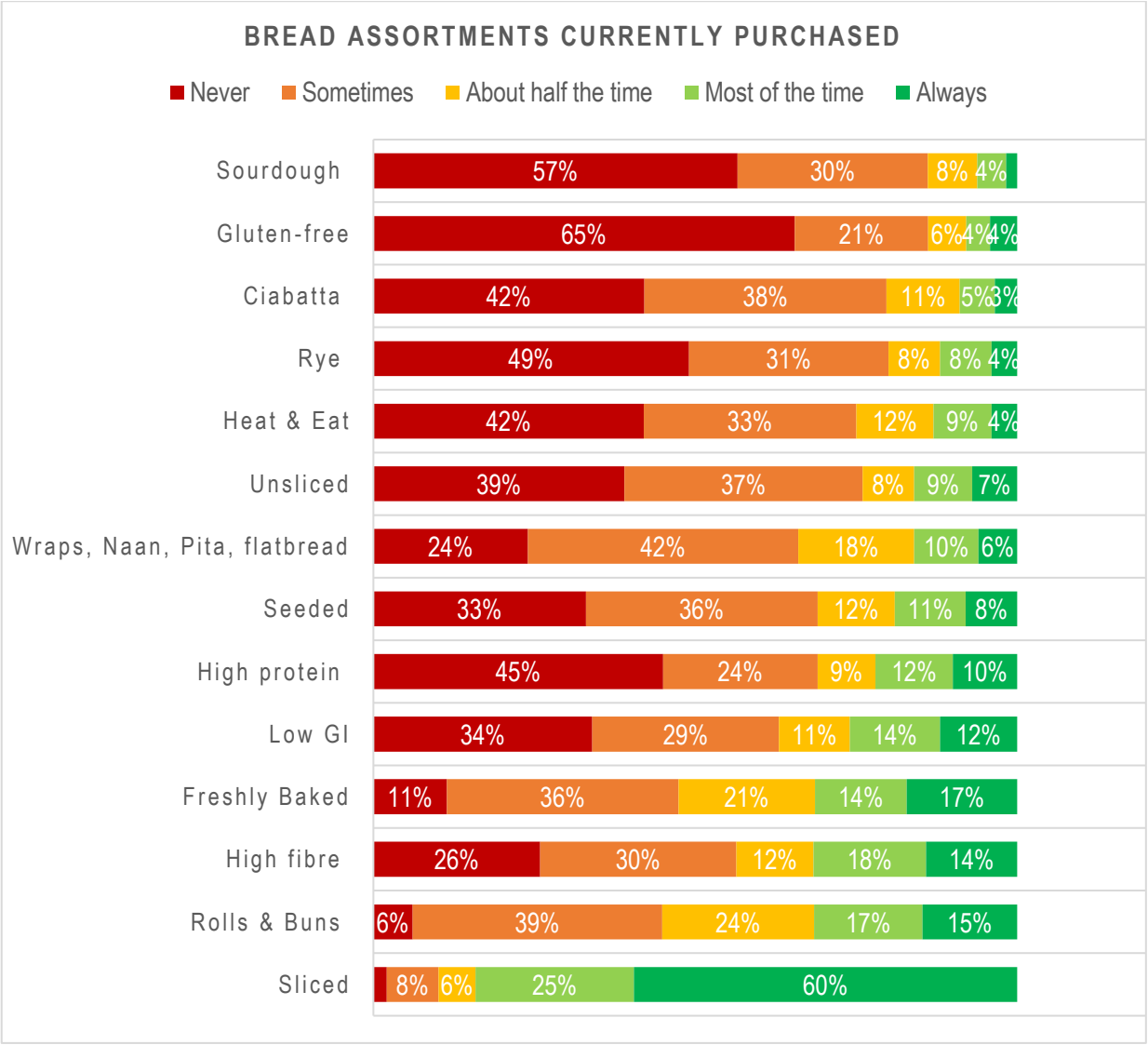

FIGURE 4.2: BREAD ASSORTMENTS CURRENTLY PURCHASED

Results in Figure 4.2 presents that 85% of the sample almost always purchase sliced bread. This may be due to convenience playing a large role in consumer purchasing behaviour (Nelson, 2019). In terms of the other options available it is interesting to note that 65% of the respondents never buy gluten free products. This may be due to numerous reasons such as unfamiliarity, affordability, availability, accessibility and choice (Mansour, John, Liamputtong & Arora, 2021).

Bread brands purchased

It is said that brands not only differentiate products from one another but also carries various non-product related attributes such as personality and emotional benefits (Jarret-Kerr, 2018). In terms of routine purchases such as bread consumers often become loyal

to brands that they have grown to trust. For this reason, market penetration into this product category is often difficult.

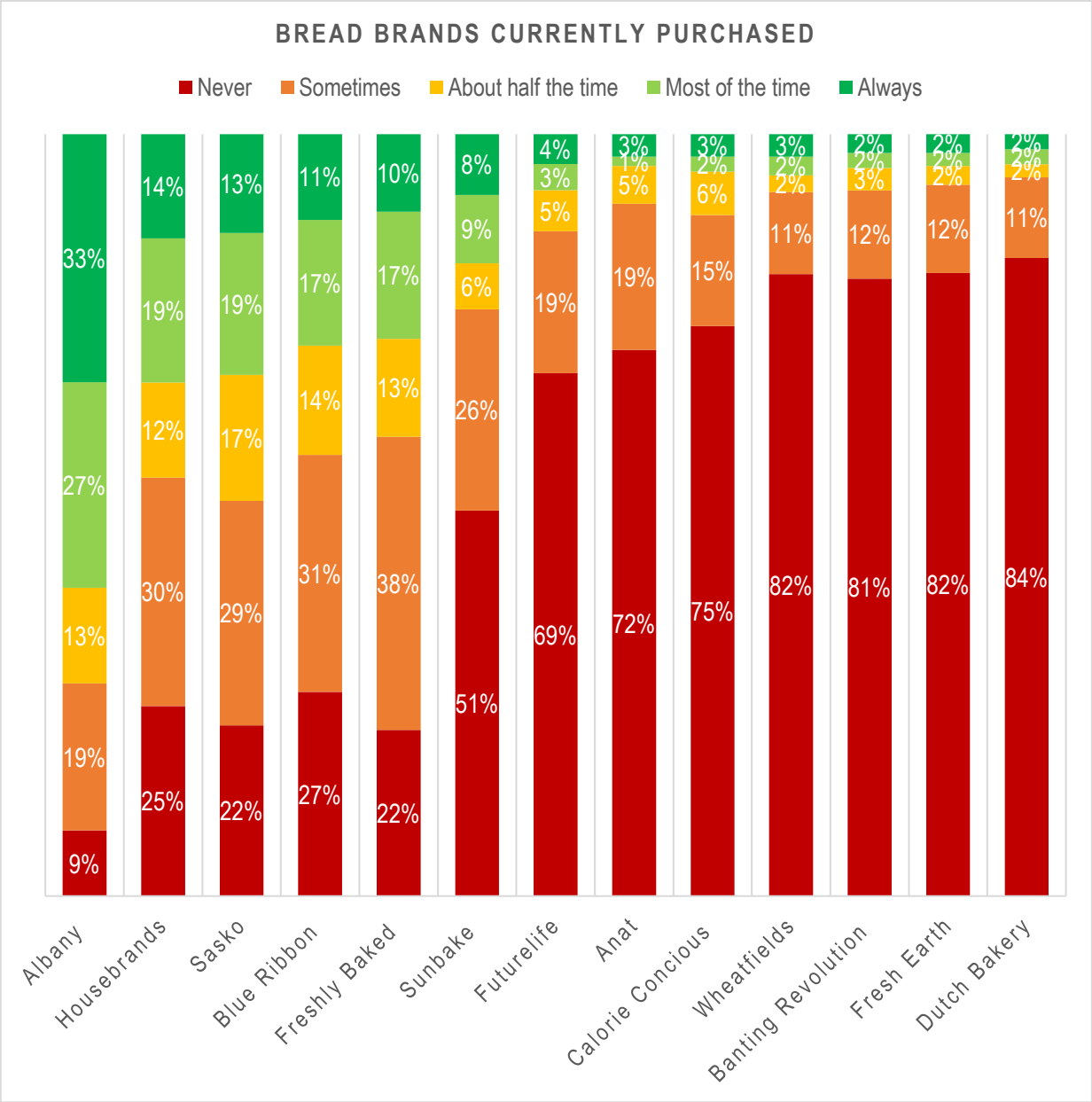

FIGURE 4.3: BREAD BRANDS CURRENTLY PURCHASED

Results pertaining to the bread brands mostly purchased by the sample are displayed in Figure 4.3. The results revealed that Albany appears to be the most popular bread brand compared to the other options. Overall, the majority (60%) of the sample indicated that they almost always purchase Albany. It was noted that a significant amount (more than 50%) of the sample never purchase brands such as Sunbake (51%), Futurelife (69%), Anat (72%), Calorie Conscious (75%), Wheatfields (82%), Banting Revolution (81%), Fresh Earth (82%) and Dutch Bakery (84%).

Large brands such as Albany are popular in countries such as South Africa for a number of reasons. This may be due to their availability, affordability and acceptability (Igumbor, Sanders, Puoane, Tsolekile, Schwarz, Purdy, Swart, Durão & Hawkes, 2012). Larger companies such as these also often launch "health and wellness" initiatives or products which appeal to the public such as wraps due to its trendiness amongst consumers.

Patronage of retailers when purchasing bread

For retailers to achieve or maintain success, a positive store image and high-quality merchandise is key. By focusing on promotions, quality and overall store image, retailers can achieve a competitive advantage over competitors and build a relationship with consumers (Grewal, Krishnan, Baker & Borin, 1998). As bread is a routine purchase which is readily available in almost every retailer or grocery store, this product could be considered as a difficult product to rely on for differentiation from competitors. In order to investigate patronage of retailers, respondents were asked to indicate where they currently purchase bread products.

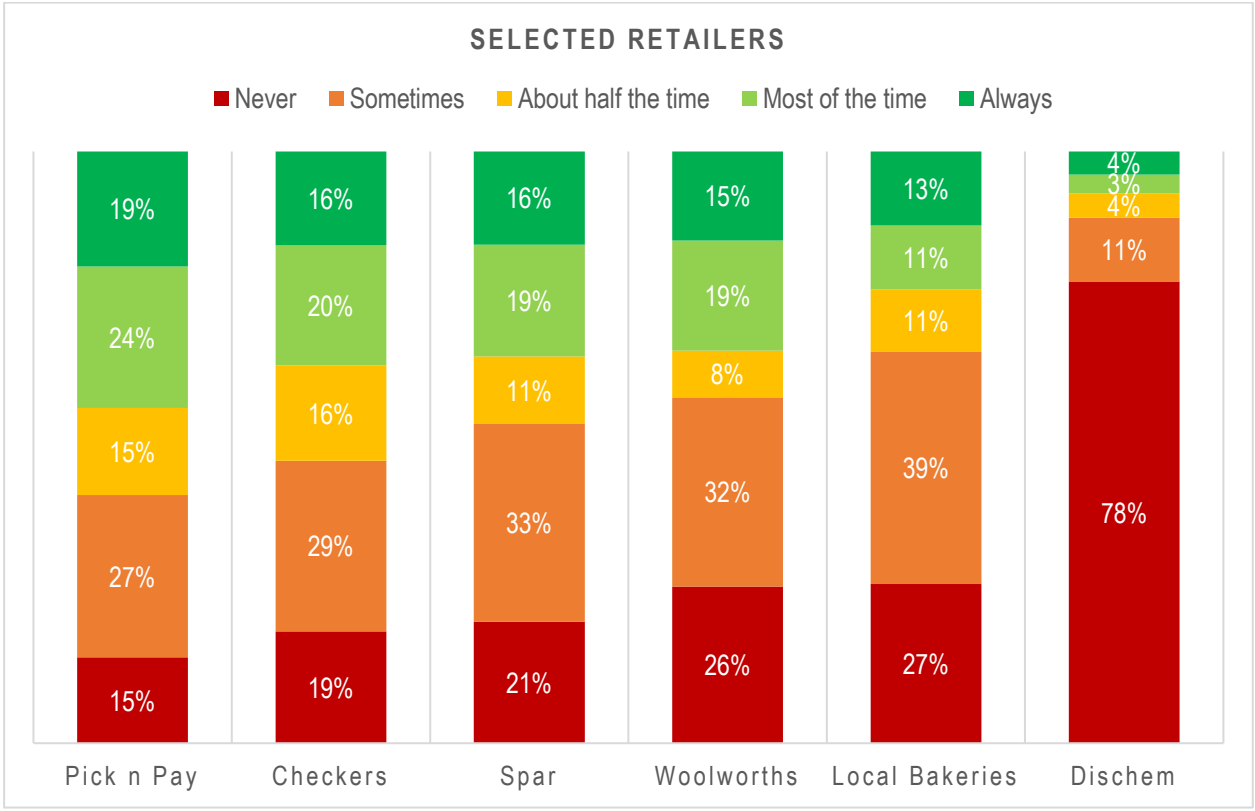

FIGURE 4.4: RESPONDENTS' PATRONAGE OF RETAILERS WHEN PURCHASING BREAD PRODUCTS

Figure 4.2 displays selected retailers which respondents currently purchased bread products from. Findings indicate that respondents mostly purchase bread products from Pick n Pay (43%) followed by Checkers (36%), Spar (35%), Woolworths (34%) and Local Bakeries (24%). Interestingly 78% of sample indicated that they never purchase their bread products from Dischem. The reason for this could be attributed to the fact that retailers such as Pick n Pay are often popular stores where consumers buy general groceries. Key retailers such as Pick n Pay are also known to offer a variety of products and popular brands, therefore it is convenient for customers to purchase bread whilst shopping for other grocery products. Dischem is known to focus on pharmaceuticals and other health products instead of groceries and might therefore not be frequented for routine purchases like bread.

Daily consumption of bread (frequency/ servings per day)

According to Russell, Rasmussen and Lichtenstein (1999), grain foods form the base of a balanced diet as recommended by The Food Guide Pyramid. This pyramid recommends consuming six to eleven servings of grain foods each day (Fernandes, Garrine, Ferrão, Bell & Varzakas, 2021). A slice of bread according to Service (1992) is one serving. Below is a table that represents the sample's consumption of bread servings per day. A 5-point Likert scale was used where 1= never, 2=sometimes, 3=about half of the time, 4=most of the time and 5=always.

TABLE 4.5: SERVINGS PER DAY - SERVINGS CONSUMED PER DAY

	N	Mean	Median	Mode
One serving a day	554	3.47	4.00	4
Two servings a day	534	2.73	2.00	2
Three servings a day	514	1.85	1.00	1
Four or more servings a day	526	1.60	1.00	1

Data in Table 4.5 revealed that respondents mostly consume bread mostly one to– two servings per day (this could be consumed as a sandwich in some instances), with respective means scoring M=3.47 & M=2.73. Three or more servings a day was less popular as these options scored the lowest means (M=1.8 & M= 1.60). This behaviour may be due to a rise in and awareness about non-communicable diseases such as type 2 Diabetes which is currently reviewed as a serious concern is South Africa (Pheiffer, Pillay-van Wyk, Turawa, Levitt, Kengne & Bradshaw, 2021). Recent media campaigns

portraying bread as a “less healthy” option, may have also gave consumers the perception that bread needs to be limited in the diet (Kim, Choi & Wakslak, 2019).

4.2.2.2 Consumers’ preferences pertaining to bread products (objective 2.2)

Launching new products in the current highly competitive and somewhat saturated bread market is a challenging task (Cooper & Slagmulder, 1999). For this reason, it is not only important to understand what consumers buy but also what they ***prefer*** to buy. This will allow new product developers to act proactively and ultimately target consumers more successfully. This section presents respondents’ ***preferences*** in terms of bread products (objective 2.2). To investigate consumers’ preference pertaining to bread products, respondents were prompted to indicate specific details pertaining to their preferences by means of 5 matrix questions in Section B. Just like the actual consumption and purchasing practices that was discussed in the previous section, each of the “preference” matrix question was formulated to reflect selected dimensions presented by but also relevant to industry i.e., purchasing of category captains, assortment (line extensions), brands, retailer and serving sizes. This was also done to allow for drawing possible comparisons between actual practices and preferred practices. Respondents were asked to rate each of the scale items pertaining to the dimensions on a 5-point Likert-type scale where 1=prefer and 5=do not prefer. Data analysis included basic descriptive statistics and results are presented in terms of percentages and means.

Preferred categories when purchasing bread

When consumers are purchasing a product such as bread, consumers choose products which they believe are most likely to satisfy their preferences – these decisions are often made on the basis of the type of information presented by retailers (Poole, Martı & Giménez, 2007). Words such as “healthy” may appear on promotional material and packaging in order to sway a consumer’s decision to purchase one bread product over another. In order to investigate South African consumers preferences of bread categories/ category captains, respondents were asked which bread categories they prefer to purchase. Figure 4.5 presents the following results:

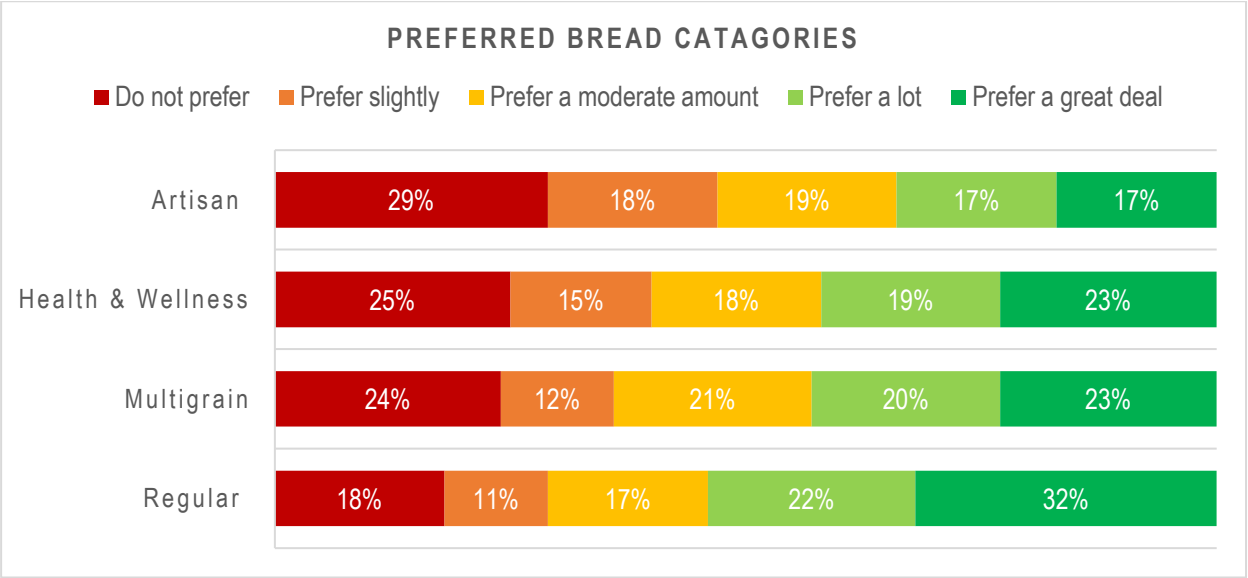

FIGURE 4.5: PREFERRED BREAD CATEGORIES

Results in Figure 4.5 (respondents preferred bread categories) presented a compiling scenario. Findings revealed that although most respondents still prefer to buy regular bread options (which is similar when compared to actual purchasing in Figure 4.1), a greater percentage of respondents indicated preferences for bread products from the multigrain (43%), health & wellness (42%) and artisan (34%) categories. This is noteworthy as all three categories presented on average a difference of 21% when compared to the results in Figure 4.1 (see Table 4.6). This could be interpreted that an appetite for alternative bread offerings exists, but current offerings might not match consumer needs and hence need to be revised.

TABLE 4.6: COMPARISON OF CURRENT/ ACTUAL PURCHASING AND PREFERRED BREAD CATEGORIES

Category	Current / actual purchasing	Preferred purchasing	Difference
Artisan	11%	34%	23%
H&W	21%	42%	21%
Multi grain	22%	43%	21%
Regular	50%	54%	4%

Preferred bread assortment when purchasing bread

Research, suggest that product assortment play a key role not only in satisfying current consumer needs but also in influencing future consumer preferences (Simonson, 1999). Respondents were asked to indicate which assortments (line and types) they prefer or

buy. This was done in order to explore possible differences compared to actual purchasing practices which could pinpoint possible future opportunities.

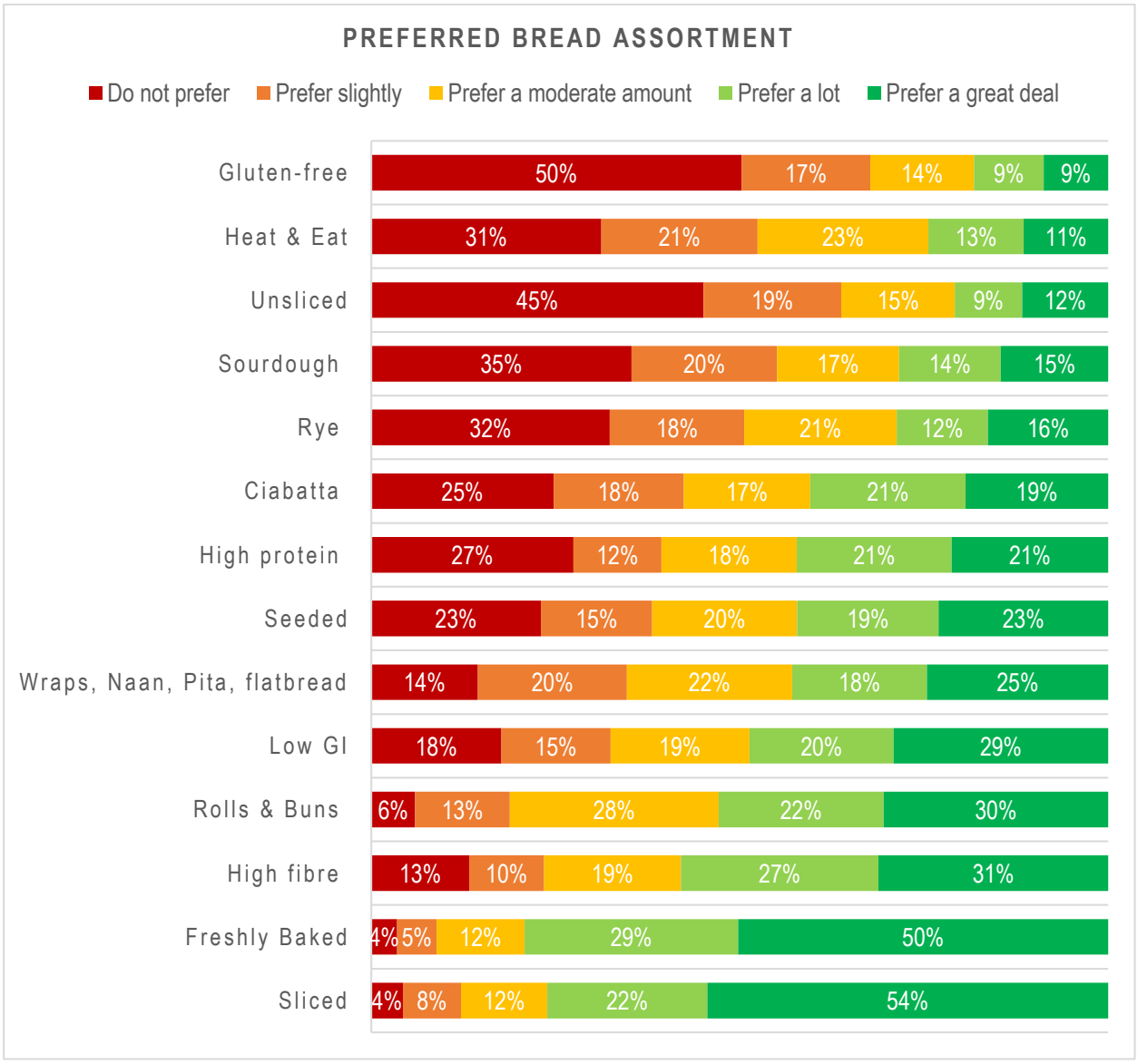

FIGURE 4.6: PREFERRED BREAD ASSORTMENTS

Figure 4.6 displays the bread assortments **preferred** by the sample. Results revealed that respondents' preferences pertaining to bread assortments, when compared to actual buying (Figure 4.2) differed. Noteworthy differences were identified where a large percentage of the sample (79%) indicated that they prefer freshly baked bread products, even though only 31% actually purchased these products (see Table 4.7), indicating a difference of 47%.

In terms of the other assortments especially those that could be labelled as more sustainable and or health conscious, most assortments e.g. seeded, sourdoughs, low GI,

high protein and high fibre presented differences greater than 20% when compared to actual buying. Interestingly, gluten free seemed to show only a slight difference.

Results in Table 4.7 show that overall, respondents' preferences differ greatly in comparison to their actual purchasing practices with most assortments presenting a difference greater than 20%. For this reason, it could be argued that based on consumer preferences there might be a large scope for introducing/ launching new innovative products into the bread market within these assortments.

TABLE 4.7: COMPARISON OF CURRENT/ ACTUAL PURCHASING AND PREFERRED BREAD ASSORTMENTS

Assortment	Current / actual purchasing	Preferred purchasing	Difference
Seeded	19%	42%	23%
Sourdough	6%	29%	23%
Ciabatta	8%	40%	34%
Rye	12%	28%	16%
High protein	22%	42%	20%
High fibre	32%	58%	26%
Low GI	26%	49%	23%
Gluten free	8%	18%	10%
Flat breads	16%	43%	27%
Heat and eat	13%	24%	11%
Freshly baked	31%	79%	48%
Rolls & buns	32%	52%	20%
Unsliced	16%	21%	5%
Sliced	85%	76%	9%

Preferred bread brands when purchasing bread

Chernev, Hamilton and Gal (2011), noted that brand experiences can change the perception consumers have of themselves and often consumer associated a specific brand with a specific attribute that they ascribe to themselves. Premium branding is also often viewed by consumers as a status symbol whereas house branding tends to be less favoured (Han, Nunes & Drèze, 2010)

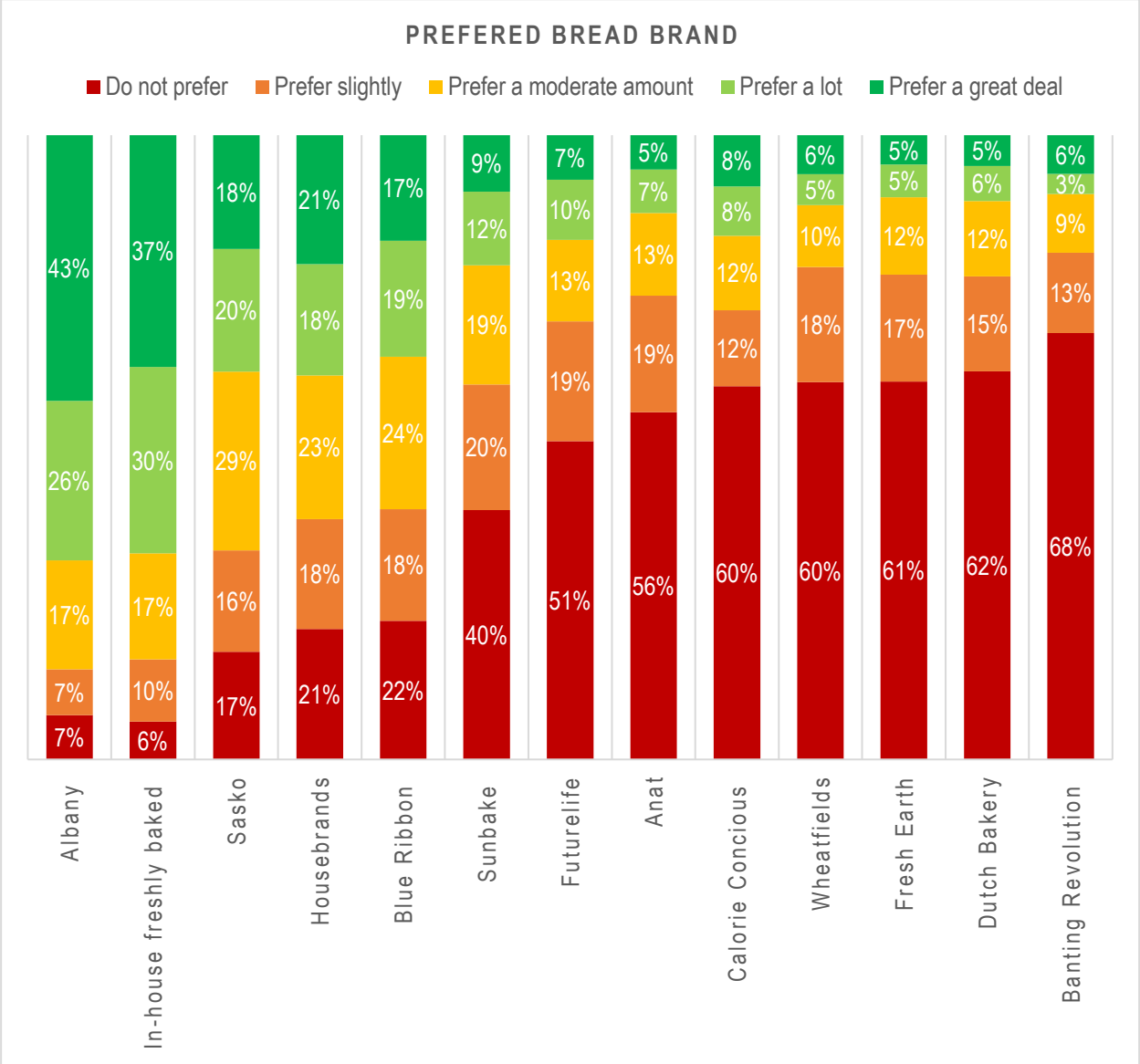

FIGURE 4.7: PREFERRED BREAD BRAND

Results in Figure 4.7 and Table 4.8, revealed no noteworthy differences between brand preferences and actual purchasing. Albany, just as seen in actual purchasing, is also the preferred bread brand amongst the sample. A possible reason for this might be that this brand is widely available in South Africa (Moula, 2006). Even though literature states that house brands (under which freshly baked could be categorised) tend to be less favoured. Results from this study showed a significant higher preference (40%) compared to actual buying. It is interesting to note that those brands that were least preferred by the sample all presented health and wellness attributes.

TABLE 4.8: COMPARISON OF CURRENT/ ACTUAL PURCHASING AND PREFERRED BREAD BRANDS

Brand	Current / actual purchasing	Preferred purchasing	Difference
Albany	60%	69%	9%
In-house freshly baked	27%	67%	40%
Sasko	32%	38%	6%
Housebrands	33%	39%	6%
Blue ribbon	28%	36%	8%
Sunbake	17%	21%	4%
Futurelife	7%	17%	10%
Anat	4%	12%	8%
Calorie conscious	5%	16%	11%
Wheatfields	5%	11%	6%
Fresh earth	4%	10%	6%
Dutch bakery	4%	11%	7%
Banting revolution	4%	9%	5%

Preferred retailer when purchasing bread

The results pertaining to respondents preferred retailers when buying bread can be seen in Figure 4.9. Attributes such as store image, in-store service, accessibility, reputation and facilities impact a consumer's preference of a retailer (Thang & Tan, 2003). Respondents were asked to indicate which retail stores they preferred when purchasing bread products in order to investigate South African consumers' preferred retailers.

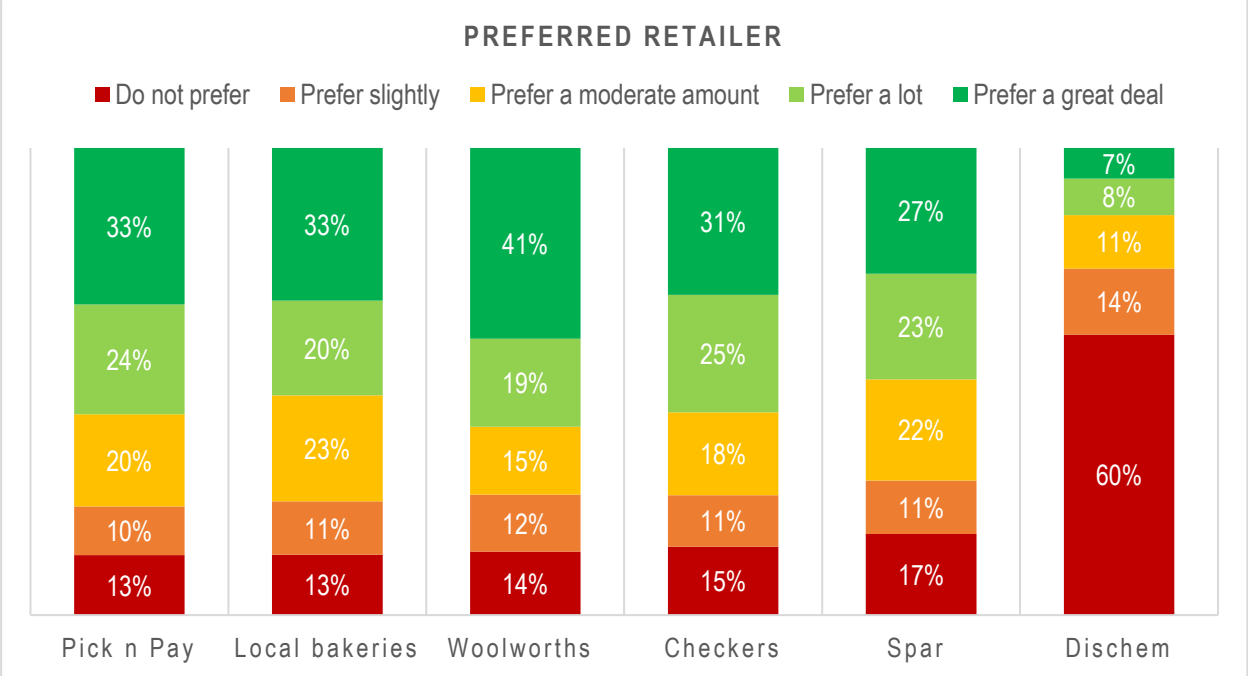

FIGURE 4.8: PREFERRED RETAILER

Analysis of the results pertaining to the respondents preferred retailer when buying bread (Figure 4.8), indicated that respondents in this study would prefer to purchase bread from Woolworths (41%). This is closely followed by Pick n Pay (33%), Local Bakeries (33%), Checkers (31%). Spar and Dischem where less preferred. Once again, a possible reason for Dischem being less favoured could be due to offering pharmaceutical products over grocery products.

Woolworths may be the preferred retailer as high product quality and positive store image are portrayed by media and other sources (King & Thobela, 2014). This differs from actual purchasing since many consumers may choose to actually purchase bread products from Pick n Pay due to affordability and accessibility (location near to stores). It was interesting to note that respondents were also more eager to buy from local bakeries, a possible reason for this may be due to the niche's and organic nature of local bakeries as well as the growing consumer trend to support local SME's.

TABLE 4.9: COMPARISON OF CURRENT/ ACTUAL PURCHASING AND PREFERRED RETAILERS

Category	Current / actual	Preferred purchasing	Difference
Pick n Pay	43%	57%	14%
Checkers	36%	56%	20%
Spar	35%	50%	15%
Woolworths	34%	60%	26%
Local Bakeries	24%	53%	29%
Dischem	7%	15%	8%

Preferred daily consumption of bread

Consumers may prefer to consume less or more than they usually do. This could be due to a number of reasons including availability, affordability and accessibility (Viljoen & Gericke, 2001). Another reason for this may be due to time constraints and various other factors such as an individual's diet or dietary constraints. Below is a table that represents the sample's preferred servings per day. A 5-point Likert scale was used where 1= never, 2=sometimes, 3=about half of the time, 4=most of the time and 5=always.

TABLE 4.10: PREFERRED SERVINGS PER DAY - PREFERRED SERVINGS PER DAY

	N	Mean	Median	Mode
One serving a day	554	3,47	4,00	4
Two servings a day	534	2,73	2,00	2
Three servings a day	514	1,85	1,00	1
Four or more servings a day	526	1,60	1,00	1

Findings in Table 4.10 emulated results presented in Table 4.5. No differences between respondents actual and preferred servings per day could be identified.

A possible reason for respondents not preferring a different serving per day might be attributed to the rise in non-communicable diseases and media portraying bread as a less healthy grain, i.e., consumers may have the perception that bread needs to be limited in the diet.

4.2.2.3 Consumers' prioritisation of selected intrinsic and extrinsic product attributes (objective 2.3) when procuring bread products

To investigate consumer prioritization of product attributes in terms of intrinsic and extrinsic attributes, respondents were presented with a matrix of 61 statements in Section D of the questionnaire. The respondents were asked to rate each statement on a Likert-type scale based on level of importance, where 1 = not at all important and 5 = absolutely essential. The included scale items represented 13 prominent food product attributes (as identified from literature) of which 8 was intrinsic (taste, visual appearance, texture, aroma, food safety, nutritional value, processing technique and ingredients) and 5 extrinsic (store image, price, brand, packaging and label). This was done to identify possible attributes that needed revision on the bread market to allow for a better adoption of future bread alternatives.

Data analysis commenced by calculating Cronbach Alpha's which allowed for the exclusion of scale items that were a poor fit for the data set (<0,5). Cronbach Alphas were all >0,7 hence resulting in retaining all of the scale items for further analysis. Once this step was completed data analysis continued with the calculation of means, standard deviation and variance explained for the combined group of respective product attributes (i.e., intrinsic and extrinsic) but also per specific attribute dimensions (i.e., *intrinsic dimensions* = visual appearance, taste, texture, aroma, food safety, ingredients, processing technique

and nutritional value / *extrinsic dimensions* = store image, price, brand, packaging and label). The means were interpreted as follows: M ≥ 5: absolutely essential, M4<5: very important, M3<4: moderately important, M2<3: of little importance, M<2 = not at all important. The highest means for each product attribute has been highlighted in red. Intrinsic and extrinsic attributes influence a consumers decision to purchase a product (Szybillo & Jacoby, 1974).

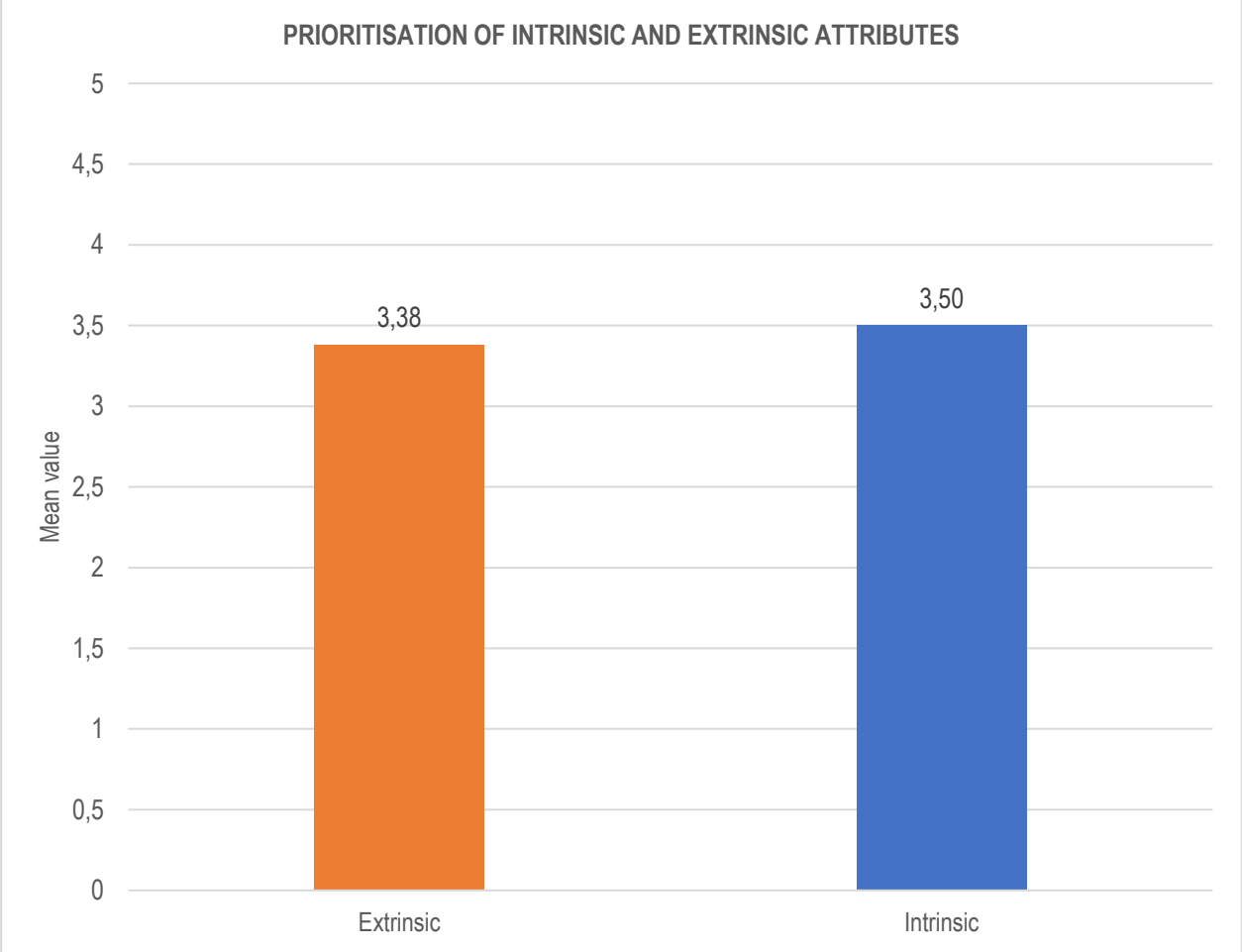

FIGURE 4.9: CONSUMERS PRIORITISATION OF INTRINSIC VERSUS EXTRINSIC PRODUCT ATTRIBUTES IN THE BREAD PRODUCT CATEGORY

The results presented in Figure 4.9 present that overall respondents from this study tend to prioritise intrinsic (M=3,50) product attributes above extrinsic attributes (M=3,38) when selecting bread products. These findings are interesting as a study done by Veale and Quester (2009) found that overall intrinsic cues are usually given more credence by consumers when purchasing food products compared to other grocery items. It can be assumed that when selecting products such as bread, where sensory perception plays a

large role, consumers tend to focus more on intrinsic product attributes over extrinsic ones.

Results in terms of the specific dimensions within each group of attributes (i.e., intrinsic and extrinsic), as well as possible differences per demographic group will be discussed in the following sections.

4.2.2.3.a Consumers' prioritisation of selected intrinsic product attributes with regard to bread products

Intrinsic attributes are linked to consumer senses and it is said that when procuring bread products, senses such as aroma, texture, smell, taste and visual appearance may play an influential role but might be prioritised differently (Drewnowski, 1997).

Results pertaining to the samples prioritisation of intrinsic attributes are presented in Figure 4.10.

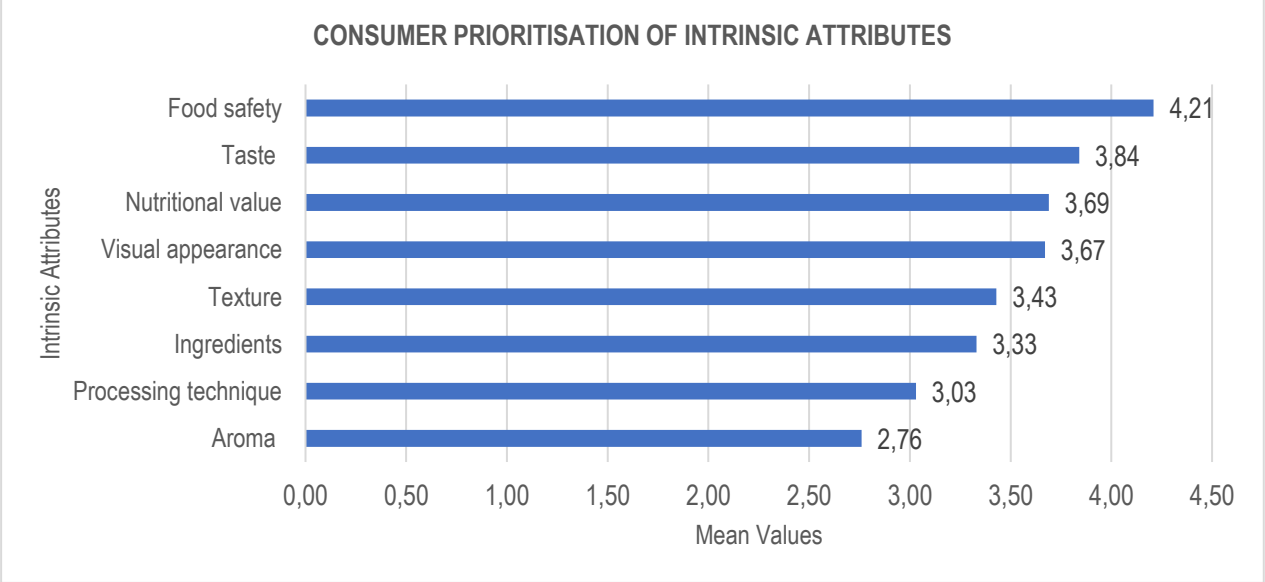

FIGURE 4.10: CONSUMERS' PRIORITISATION OF SELECTED INTRINSIC PRODUCT ATTRIBUTES WITH REGARD TO BREAD PRODUCTS

Findings indicated that in terms of the specific intrinsic attributes respondents rated food safety as the most important (M=4,21). Attributes such as taste (M=3,84), visual appearance (M=3,67), nutritional value (M=3,69), texture (M=3,43), ingredients (M=3,33) and processing technique (M=3,03) were all rated as moderately important. In a study

done by Kuhar, Korošec, Bolha, Pravst and Hristov (2020), it was highlighted that the most important sensory attribute when purchasing bread is taste. Taste and pleasure are closely linked when selecting food products such as bread. It was interesting to note that aroma (M=2.76) was indicated as an attribute that is of little importance when selecting bread products. This is somewhat concerning as aroma is known and listed in literature as a significant factor that has the ability to entice customers to purchase bread products (Spence, 2015). Aroma is often linked to advertising and media when considering bread products, therefore it is fascinating that this attribute was scored so low in this study. One possible reason for the prioritisation of food safety above "traditional" attributes such as taste and aroma might be consumers heightened sense of food safety and hygiene during the on-going pandemic.

Findings which relate to individual scale items (Addendum E) reveal that in terms of **food safety**, respondents rated items concerning consumption and quality as more important compared to safe storage and safe product sourcing. According to Feng and Archila-Godinez (2021), consumers perceive bread related products to pose less of a food safety risk compared to other food products on the retail market. It is therefore interesting to note that respondents in this study scored these factors as highly as they did. This finding may be a result of the ongoing COVID-19 pandemic, as consumers are more aware of food safety during this time (Eger *et al.*, 2021).

With regard to **taste**, which is considered as a crucial component when evaluating bread products (Sajdakowska, Gębski, Żakowska-Biemans & Jeżewska-Zychowicz, 2019), respondents seemed to prioritise fresh taste (M=4.33) and appealing taste (M= 4.11) by rating them as extremely important when evaluating bread products on the market. This may be due to the perception of these foods posing a healthy image, which may appeal to consumers (Zhang, 2016).

In terms of **visual appearance**, respondents indicated that a **fresh appearance** (M=4.22) was considered very important. Other factors pertaining to visual appearance such as colour and size was rated as moderately important by the sample. Appearance plays a large role in purchasing decisions of food products including aspects such as colour and size (Vermeir & Roose, 2020), therefore it is interesting that only fresh appearance was rated as very important by the sample.

Items relating to **texture** (M=3.43) was rated as moderately important. It is said that texture in bread products is seen as one of the most pleasurable elements when consuming bread as it aids in mouth feel (Damat, Setyobudi, Soni, Tain, Handjani & Chasanah, 2020).

In terms of **ingredients**, items relating to health ((healthy ingredients (M=3.80) and natural ingredients (M=3.55)) was rated as more important compared to items relating to product quality such as colourants (M=3.27) and preservatives (M=3.27). These results confirm findings by Bitzios, Fraser and Haddock-Fraser (2011), that state that our choice of food products have the potential to decrease the risk of diseases depending on the ingredients in the food products. These results could also be attributed to respondents heightened sense of health and safety during the COVID-19 pandemic.

Findings pertaining to **processing techniques and/ or production** demonstrate that respondents tend to prioritise items relating to locally, natural and uncomplicated production techniques, whereas, innovative processing techniques (M=2.75) were rated of little importance by the sample.

Regarding **aroma,** results showed that the sample prioritised a toasted aroma (M=2.92) over sweet aroma (M=2.75), wheat aroma (M=2.73) and yeast aroma (M=2.60). This may be caused by the fact that consumers were unable to smell bread products due to the on-going pandemic (Desai & Oppenheimer, 2021).

4.2.2.3.b Differences in consumers' prioritisation of specific intrinsic product attributes with regard to bread products

One-way ANOVA and t-tests were used to seek significant differences pertaining to the 8 intrinsic attributes across selected demographic characteristics. Gender, age and income are all listed as important demographic characteristics often used within the food retail environment and was therefore included in this study (Lee, Cho, Xu & Fairhurst, 2010). These findings are presented in Table 4.11. Where evidence of significant differences occurred, Bonferroni post-hoc tests were done to specify the nature of the differences amongst the sample. The significant differences across selected demographic characteristics will be presented and discussed per attribute.

TABLE 4.11: INTRINSIC PRODUCT ATTRIBUTES

Sociodemographic attributes	Intrinsic product attributes																							
	Food Safety			**Taste**			**Nutritional Value**			**Visual Appearance**			**Texture**			**Ingredients**			**Processing Technique**			**Aroma**		
	(M=4.21)			**(M=3.84)**			**(M=3.69)**			**(M=3.67)**			**(M=3.43)**			**(M=3.33)**			**(M=3.03)**			**(M=2.76)**		
Gender	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**
Male	172	4,10	0,05	170	3,77	,056	169	3,68	0,07	169	3,64	0,07	164	3,60	,088	172	3,37	0,07	170	3,18	0,07	171	2,93	0,07
Female	266	4,29	0,04	265	3,88	,042	265	3,71	0,06	266	3,68	0,05	265	3,32	,075	266	3,30	0,05	264	2,93	0,05	265	2,65	0,05
Total	438	4,20	0,05	435	3,83	,049	434	3,69	0,07	435	3,66	0,06	429	3,46	,082	438	3,34	0,06	434	3,06	0,06	436	2,79	0,06
P-value	0,68			0,43			0,84			0,50			0,07			0,98			0,55			0,12		
Age	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**
18-24 Gen Z	188	4,29	0,04	186	3,88	,052	187	3,74	0,07	186	3,80	0,06	184	3,53	0,09	188	3,28	,067	186	3,00	0,06	187	2,73	0,06
25-40 Millennials	153	4,18	0,05	153	3,79	,060	152	3,71	0,08	152	3,59	0,07	151	3,34	0,10	153	3,36	,074	153	3,01	0,08	153	2,83	0,08
41-56 Gen X	76	4,18	0,07	76	3,85	,071	75	3,59	0,10	76	3,56	0,09	75	3,47	0,13	76	3,38	,098	75	3,19	0,09	77	2,77	0,10
57-75 Boomers	22	3,93	0,20	21	3,85	,104	21	3,52	0,20	22	3,47	0,19	20	3,00	0,18	22	3,35	,162	21	2,91	0,16	20	2,38	0,14
Total	439	4,21	0,03	436	3,84	,033	435	3,69	0,05	436	3,67	0,04	430	3,43	0,06	439	3,33	,043	435	3,03	0,04	437	2,76	0,04
P-value	0,06			0,72			0,55			0,03			0,20			0,81			0,38			0,20		
Income	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**
<= 6000,00	108	4,26	0,07	107	3,95	0,07	107	3,90	0,09	107	3,78	0,08	107	3,77	0,10	107	3,47	0,08	107	3,27	0,09	109	3,03	0,09
6001,00 - 10000,00	25	4,21	0,13	25	3,86	0,16	25	3,77	0,19	25	3,81	0,14	25	3,76	0,23	25	3,59	0,17	25	3,28	0,18	25	2,91	0,20
10001,00 - 20000,00	52	4,33	0,07	52	3,79	0,10	51	3,72	0,13	52	3,70	0,12	51	3,51	0,18	52	3,39	0,13	52	2,99	0,13	52	2,77	0,14
20001,00 - 30000,00	48	4,25	0,08	48	3,73	0,12	47	3,63	0,15	47	3,46	0,12	44	3,36	0,20	48	3,21	0,13	47	2,99	0,14	47	2,77	0,15
30001,00 - 50000,00	90	4,28	0,06	90	3,88	0,07	90	3,58	0,10	90	3,71	0,08	90	3,19	0,13	90	3,23	0,09	90	2,83	0,09	90	2,55	0,08
50001,00 - 70833,33	40	4,04	0,12	39	3,75	0,10	39	3,54	0,14	40	3,60	0,13	39	3,23	0,20	40	3,22	0,14	39	2,93	0,13	39	2,62	0,12
Total	363	4,25	0,03	361	3,85	0,04	359	3,71	0,05	361	3,69	0,04	356	3,47	0,06	362	3,34	0,05	360	3,05	0,05	362	2,79	0,05
P-value	0,37			0,41			0,16			0,30			0,01			0,18			0,01			0,01		

M*=Mean maximum of 5; SEM= Standard error of the mean; p-values indicate significant differences (p≤0.05)

Intrinsic attribute 1: Food safety

Gender, age and income

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in neither of the demographic categories mentioned above. Thus, one can conclude that neither gender, age nor income can be used to predict consumers prioritisation of the intrinsic attribute “food safety” when procuring bread.

Intrinsic attribute 2: Taste

Gender, age and income

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in neither of the demographic categories mentioned above. Thus, one can conclude that neither gender, age nor income can be used to predict consumers prioritisation of the intrinsic attribute “taste” when procuring bread.

Intrinsic attribute 3: Nutritional value

Gender, age and income

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in neither of the demographic categories mentioned above. Thus, one can conclude that neither gender, age nor income can be used to predict consumers prioritisation of the intrinsic attribute “nutritional value” when procuring bread.

Intrinsic attribute 4: Visual appearance

Gender and income

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in either of the demographic categories mentioned above. Thus, one can conclude that neither gender nor income can be used to predict consumers prioritisation of the intrinsic attribute “visual appearance” when procuring bread.

AGE

TABLE 4.12: CONSUMER PRIORITISATION OF INTRINSIC ATTRIBUTES IN TERMS OF VISUAL APPEARANCE IN RELATION TO AGE

Visual Appearance (M=3,67)	Age	Age groups	Mean	Mean Difference	SEM	P-value
	18-24 Gen Z (M=3,80)	25-40 Millennials	3,59	0,21097	0,08760	0,029
		41-56 Gen X	3,56	0,23783	0,10907	0,179
		57-75 Boomers	3,47*	0,32356	0,18063	0,444
	25-40 Millennials (M=3,59)	18-24 Gen Z	3,80	-0,21097	0,08760	0,099
		41-56 Gen X	3,56	0,02686	0,11255	1,000
		57-75 Boomers	3,47	0,11259	0,18275	1,000
	41-56 Gen X (M=3,56)	18-24 Gen Z	3,80	-0,23783	0,10907	0,179
		25-40 Millennials	3,59	-0,02686	0,11255	1,000
		57-75 Boomers	3,47	0,08573	0,19396	1,000
	57-75 Boomers (M=3,47)	18-24 Gen Z	3,80*	-0,32356	0,18063	-0,029
		25-40 Millennials	3,59	-0,11259	0,18275	1,000
		41-56 Gen X	3,56	-0,08573	0,19396	1,000

Findings presented in Table 4.11 reflect on various age cohorts in terms of visual appearance. ANOVA revealed the presence of a significant difference amongst the different age cohorts (p-value =0,03). Findings revealed that prioritisation of visual appearance by the age cohort gen Z (M=3,80) is significantly higher compared to the age cohort baby boomers (M=3,47). This could be because the baby boomers might be less concerned with visual appearance when buying bread and more concerned with more imperative attributes such as sustainability (Tait, Saunders, Dalziel, Rutherford, Driver & Guenther, 2020).

Intrinsic attribute 5: Texture

Gender and age

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in either of the demographic categories mentioned above. Thus, one can conclude that neither gender nor age can be used to predict consumers prioritisation of the intrinsic attribute “texture” when procuring bread.

INCOME

TABLE 4.13: CONSUMER PRIORITISATION OF INTRINSIC ATTRIBUTES IN TERMS OF TEXTURE IN RELATION TO INCOME

Texture (M=3,43)	Income	Income groups	Mean	Mean Difference	SEM	P-value
	<= 6000,00 (M=3,77)	6001,00 - 10000,00	3,76	0,00636	0,26267	1,000
		10001,00 - 20000,00	3,51	0,25655	0,20120	1,000
		20001,00 - 30000,00	3,36	0,40272	0,21176	0,870
		30001,00 - 50000,00	3,19	0,57747*	0,16912	0,011
		50001,00 - 70833,33	3,23	0,53559	0,22117	0,239
	6001,00 - 10000,00 (M=3,76)	<= 6000,00	3,77	-0,00636	0,26267	1,000
		10001,00 - 20000,00	3,51	0,25020	0,28869	1,000
		20001,00 - 30000,00	3,36	0,39636	0,29615	1,000
		30001,00 - 50000,00	3,19	0,57111	0,26732	0,500
		50001,00 - 70833,33	3,23	0,52923	0,30295	1,000
	10001,00 - 20000,00 (M=3,51)	<= 6000,00	3,77	-0,25655	0,20120	1,000
		6001,00 - 10000,00	3,76	-0,25020	0,28869	1,000
		20001,00 - 30000,00	3,36	0,14617	0,24329	1,000
		30001,00 - 50000,00	3,19	0,32092	0,20724	1,000
		50001,00 - 70833,33	3,23	0,27903	0,25153	1,000
	20001,00 - 30000,00 (M=3,36)	<= 6000,00	3,77	-0,40272	0,21176	,870
		6001,00 - 10000,00	3,76	-0,39636	0,29615	1,000
		10001,00 - 20000,00	3,51	-0,14617	0,24329	1,000
		30001,00 - 50000,00	3,19	0,17475	0,21751	1,000
		50001,00 - 70833,33	3,23	0,13287	0,26005	1,000
	30001,00 - 50000,00 (M=3,19)	<= 6000,00	3,77	-0,57747*	0,16912	0,011
		6001,00 - 10000,00	3,76	-0,57111	0,26732	0,500
		10001,00 - 20000,00	3,51	-0,32092	0,20724	1,000
		20001,00 - 30000,00	3,36	-0,17475	0,21751	1,000
		50001,00 - 70833,33	3,23	-0,04188	0,22668	1,000
	50001,00 - 70833,33 (M=3,23)	<= 6000,00	3,77	-0,53559	0,22117	0,239
		6001,00 - 10000,00	3,76	-0,52923	0,30295	1,000
		10001,00 - 20000,00	3,51	-0,27903	0,25153	1,000
		20001,00 - 30000,00	3,36	-0,13287	0,26005	1,000
		30001,00 - 50000,00	3,19	0,04188	0,22668	1,000

As illustrated in Table 4.11, significant differences amongst the six income groups (p=0,01) were identified through ANOVA. The subsequent post-hoc Bonferroni test (Table 4,13) revealed that the lowest income group (earning below R6000) tend to prioritise attributes such as texture significantly more (M=3,77) than middle to high income groups (earning between R30001 and R50000) (M=3,19). The reason for this may be that lower income groups may consume bread with almost every meal (Mansoor, Ali, Arif, Moin & Hasnain, 2019), as bread is a staple in these homes, which may make texture an important attribute.

Intrinsic attribute 6: Ingredients

Gender, age and income

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in either of the demographic categories mentioned above. Thus, one can conclude that neither gender, age nor income can be used to predict consumers prioritisation of the intrinsic attribute “ingredients” when procuring bread.

Intrinsic attribute 7: Processing technique

Gender and age

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in either of the demographic categories mentioned above. Thus, one can conclude that neither gender nor age can be used to predict consumers prioritisation of the intrinsic attribute “processing technique” when procuring bread.

INCOME

TABLE 4.14: CONSUMER PRIORITISATION OF INTRINSIC ATTRIBUTES IN TERMS OF PROCESSING TECHNIQUE IN RELATION TO INCOME

Processing Technique (M=3,03)	Income	Income groups	Mean	Mean Difference	SEM	P-value
	<= 6000,00 (M=3,27)	6001,00 - 10000,00	3,28	-0,0132	0,1962	1,000
		10001,00 - 20000,00	2,99	0,2850	0,1493	0,857
		20001,00 - 30000,00	2,99	0,2795	0,1546	1,000
		30001,00 - 50000,00	2,83	0,44581*	0,1263	0,007
		50001,00 - 70833,33	2,93	0,3412	0,1652	0,594
	6001,00 - 10000,00 (M=3,28)	<= 6000,00	3,27	0,0132	0,1962	1,000
		10001,00 - 20000,00	2,99	0,2981	0,2150	1,000
		20001,00 - 30000,00	2,99	0,2926	0,2186	1,000
		30001,00 - 50000,00	2,83	0,4590	0,1997	0,332
		50001,00 - 70833,33	2,93	0,3544	0,2263	1,000
	10001,00 - 20000,00 (M=2,99)	<= 6000,00	3,27	-0,2850	0,1493	0,857
		6001,00 - 10000,00	3,28	-0,2981	0,2150	1,000
		20001,00 - 30000,00	2,99	-0,0055	0,1778	1,000
		30001,00 - 50000,00	2,83	0,1608	0,1539	1,000
		50001,00 - 70833,33	2,93	0,0562	0,1871	1,000
	20001,00 - 30000,00 (M=2,99)	<= 6000,00	3,27	-0,2795	0,1546	1,000
		6001,00 - 10000,00	3,28	-0,2926	0,2186	1,000
		10001,00 - 20000,00	2,99	0,0055	0,1778	1,000
		30001,00 - 50000,00	2,83	0,1664	0,1590	1,000
		50001,00 - 70833,33	2,93	0,0617	0,1913	1,000
	30001,00 - 50000,00 (M=2,83)	<= 6000,00	3,27	-0,44581*	0,1263	0,007
		6001,00 - 10000,00	3,28	-0,4590	0,1997	0,332
		10001,00 - 20000,00	2,99	-0,1608	0,1539	1,000
		20001,00 - 30000,00	2,99	-0,1664	0,1590	1,000
		50001,00 - 70833,33	2,93	-0,1046	0,1693	1,000
	50001,00 - 70833,33 (M=2,93)	<= 6000,00	3,27	-0,3412	0,1652	0,594
		6001,00 - 10000,00	3,28	-0,3544	0,2263	1,000
		10001,00 - 20000,00	2,99	-0,0562	0,1871	1,000
		20001,00 - 30000,00	2,99	-0,0617	0,1913	1,000
		30001,00 - 50000,00	2,83	0,1046	0,1693	1,000

Results derived from the ANOVA in Table 4.11, showed the presence of significant differences amongst the six income groups (p=0,01) The subsequent Post-hoc Bonferroni test revealed that the lowest income group (earning below R6000) tend to prioritise the attribute processing technique significantly more (M=3,27) than middle to higher income groups (earning between R30001 and R50000) (M=2,83).

Intrinsic attribute 8: Aroma

Gender and age

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in either of the demographic categories mentioned above. Thus, one can conclude that

neither gender nor age can be used to predict consumers prioritisation of the intrinsic attribute “aroma” when procuring bread.

INCOME

TABLE 4.15: CONSUMER PRIORITISATION OF INTRINSIC ATTRIBUTES IN TERMS OF AROMA IN RELATION TO INCOME

Aroma (M=2,76)	Income	Income groups	Mean	Mean Difference	SEM	P-value
	<= 6000,00 (M=3,03)	6001,00 - 10000,00	2,91	0,11676	0,19890	1,000
		10001,00 - 20000,00	2,77	0,26073	0,15117	1,000
		20001,00 - 30000,00	2,77	0,26080	0,15652	1,000
		30001,00 - 50000,00	2,55	0,47676*	0,12775	0,003
		50001,00 - 70833,33	2,62	0,40496	0,16736	0,241
	6001,00 - 10000,00 (M=2,91)	<= 6000,00	3,03	-0,11676	0,19890	1,000
		10001,00 - 20000,00	2,77	0,14397	0,21830	1,000
		20001,00 - 30000,00	2,77	0,14404	0,22204	1,000
		30001,00 - 50000,00	2,55	0,36000	0,20278	1,000
		50001,00 - 70833,33	2,62	0,28821	0,22981	1,000
	10001,00 - 20000,00 (M=2,77)	<= 6000,00	3,03	-0,26073	0,15117	1,000
		6001,00 - 10000,00	2,91	-0,14397	0,21830	1,000
		20001,00 - 30000,00	2,77	0,00007	0,18053	1,000
		30001,00 - 50000,00	2,55	0,21603	0,15624	1,000
		50001,00 - 70833,33	2,62	0,14423	0,19000	1,000
	20001,00 - 30000,00 (M=2,77)	<= 6000,00	3,03	-0,26080	0,15652	1,000
		6001,00 - 10000,00	2,91	-0,14404	0,22204	1,000
		10001,00 - 20000,00	2,77	-0,00007	0,18053	1,000
		30001,00 - 50000,00	2,55	0,21596	0,16142	1,000
		50001,00 - 70833,33	2,62	0,14416	0,19429	1,000
	30001,00 - 50000,00 (M=2,55)	<= 6000,00	3,03	-0,47676*	0,12775	0,003
		6001,00 - 10000,00	2,91	-0,36000	0,20278	1,000
		10001,00 - 20000,00	2,77	-0,21603	0,15624	1,000
		20001,00 - 30000,00	2,77	-0,21596	0,16142	1,000
		50001,00 - 70833,33	2,62	-0,07179	0,17196	1,000
	50001,00 - 70833,33 (M=2,62)	<= 6000,00	3,03	-0,40496	0,16736	0,241
		6001,00 - 10000,00	2,91	-0,28821	0,22981	1,000
		10001,00 - 20000,00	2,77	-0,14423	0,19000	1,000
		20001,00 - 30000,00	2,77	-0,14416	0,19429	1,000
		30001,00 - 50000,00	2,55	0,07179	0,17196	1,000

Results derived from the ANOVA in Table 4.11 showed the presence of significant differences amongst the six income groups (p=0,01). The subsequent Post-hoc Bonferroni test revealed that the lowest income group (earning below R6000) tend to prioritise the attribute aroma significantly more (M=3,03) than middle to higher income groups (earning between R30001 and R50000) (M=2,55). This is interesting as during the COVID-19 pandemic in higher end retail stores, bread needed to be packaged according to regulations. Whereas, in kiosks and spaza shops (that is often frequented

by lower income customers') this may not have been regulated as strictly to package baked products (government loaf).

4.2.2.3.c Consumers' prioritisation of selected extrinsic product attributes when selecting bread products

Outside influences also known as, extrinsic attributes, play a large role in purchasing decisions pertaining to food products such as bread (Bolha, Blaznik & Korošec, 2020). Hence understanding consumer's prioritisation of these attributes could assist in revising current products (i.e., more sustainable options) in order to position them better on the market.

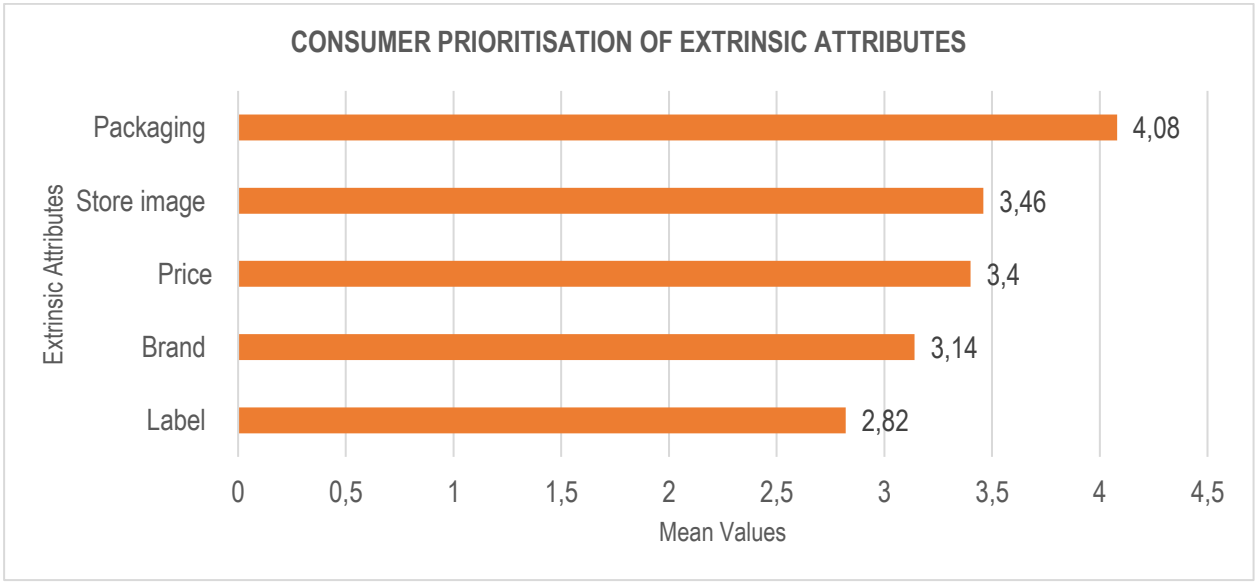

FIGURE 4.11: CONSUMERS' PRIORITISATION OF SELECTED INTRINSIC PRODUCT ATTRIBUTES WITH REGARD TO BREAD PRODUCTS

It is interesting to note that in terms of specific extrinsic product attributes, respondents placed great emphasis on product packaging (M=4,08). Compared to other studies these findings are reasonably unique as similar studies revealed that price is usually prioritised by consumers when selecting and ultimately buying food products such as bread (Kuhar *et al.*, 2020).

Literature notes that food packaging plays a crucial role in terms of ensuring food safety and product integrity (Coles, McDowell & Kirwan, 2003). The findings pertaining to the extrinsic attributes as presented in this study although unique also supports the findings

revealed amongst the intrinsic attributes i.e., emphasis placed on food safety. A possible explanation for these findings is that the on-going pandemic heightened consumers awareness of food safety and hence also the importance of product packaging. Attributes such as price, which was prioritised prior to the COVID-19 pandemic, might be less of a concern during the pandemic (Kitz, Walker, Charlebois & Music, 2021). Considering the current COVID-19 pandemic these results thus make sense as most consumers have adopted a heightened concern for health and safety (Chae, 2021).

In terms of specific extrinsic scale items (Addendum E), results present that when considering **packaging**, respondents prioritise items related to hygiene (M=4,19) and safety (M=3,98). One of the main reasons for this might be the ongoing pandemic which highlighted health and safety (packaging) as of great importance (Kitz *et al.*, 2021).

In terms of **store image**, respondents prioritised items relating to quality (M=3,86) and availability (M=3,78) whereas items relating to the stores' attractiveness (M=2,97) and merchandising (M=3,18) were considered as less important. This may be due to respondents being hesitant to shop and leave their homes during the COVID-19 pandemic (Truong & Truong, 2022). According to literature consumers' prioritisation of store image do play a big role in their attitude towards the product assortment carried in the store as well as ultimate purchasing (Alic, Agic & Cinjarevic, 2017).

Price is often a crucial dimension when evaluating a food product such as bread (Grewal *et al.*, 1998). Respondents in this study rated all but one of the scale items pertaining to price as moderately important. Interestingly higher pricing (M=2,45) was rated as an attribute of least importance.

In terms of **branding**, findings presented that respondents from this study had little to no concern when buying bread as most of the items were rated below M=3,5. One possible reason for this might be that bread is a routine purchase behaviour that is often bought without any consideration or serious thought. Previous results in this study also indicated that the majority of this sample seemed to be brand loyal. For example, Albany was not only the most purchased brand but also the most preferred brand.

Results pertaining to **labelling**, presented that respondents rated all but one (informative label M=3,50) of the items relating to labelling to be of little importance. This is an

interesting finding, as labels are often linked to trust in food safety of the product (Rupprecht *et al.*, 2020). Consumers are becoming increasingly concerned with food safety and in some cases, a healthy di*et al*though consumer interest in the use of food labels during purchase remains significantly low (Tse, W.K, 2006). This may be due to consumers not fully understanding and not fully utilising these labels.

4.2.2.3.d Differences in consumers' prioritisation of specific extrinsic product attributes with regard to bread products

One-way ANOVA and t-tests were used to seek significant differences pertaining to the 5 extrinsic attributes across selected demographic characteristics. Gender, age and income are all listed as important demographic characteristics often used within the food retail environment and was therefore included in this study (Lee *et al.*, 2010). These findings are presented in Table 4.16. Where evidence of significant differences occurred, Bonferroni post-hoc tests were done to specify the nature of the differences amongst the sample.

The significant differences across selected demographic characteristics will be presented and discussed per attribute.

TABLE 4.16: EXTRINSIC PRODUCT ATTRIBUTES

Sociodemographic attributes	Extrinsic product attributes														
	Packaging (M=4.08)			Store Image (M=3.46)			Price (M=3.40)			Brand (M=3.14)			Label (M=2.82)		
Gender	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**
Male	168	3,86	0,07	170	3,59	0,07	170	3,51	0,06	173	3,34	0,07	168	3,05	0,07
Female	265	4,22	0,05	265	3,37	0,05	265	3,33	0,05	266	3,01	0,05	264	2,67	0,05
Total	433	4,04	0,06	435	3,48	0,06	435	3,42	0,06	439	3,17	0,06	432	2,86	0,06
P-value	0,17			0,02			0,86			0,12			0,04		
Age	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**
18-24 Gen Z	186	4,20	0,07	187	3,44	0,06	187	3,45	0,06	188	3,21	0,06	186	2,89	0,07
25-40 Millennials	153	3,94	0,08	152	3,46	0,07	153	3,40	0,07	154	3,16	0,07	153	2,83	0,08
41-56 Gen X	74	4,09	0,08	76	3,52	0,09	75	3,35	0,09	76	3,05	0,10	73	2,71	0,11
57-75 Boomers	21	3,98	0,17	21	3,31	0,17	21	3,12	0,18	22	2,72	0,16	21	2,47	0,20
Total	434	4,08	0,04	436	3,46	0,04	436	3,40	0,04	440	3,14	0,04	433	2,82	0,04
P-value	0,06			0,75			0,32			0,06			0,14		
Income	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**	**N**	**M**	**SEM**
<= 6000,00	106	4,12	0,09	108	3,75	0,07	107	3,62	0,07	109	3,41	0,08	107	3,15	0,08
6001,00 - 10000,00	25	3,90	0,21	25	3,54	0,15	25	3,55	0,17	25	3,39	0,19	25	3,16	0,15
10001,00 - 20000,00	51	4,16	0,12	52	3,45	0,12	51	3,64	0,09	52	3,18	0,11	50	2,79	0,14
20001,00 - 30000,00	48	4,00	0,11	47	3,26	0,11	48	3,39	0,12	48	3,03	0,14	48	2,67	0,15
30001,00 - 50000,00	90	4,17	0,10	89	3,31	0,08	90	3,20	0,09	90	2,99	0,09	90	2,65	0,10
50001,00 - 70833,33	39	4,00	0,14	39	3,26	0,12	39	3,22	0,10	40	3,01	0,11	39	2,75	0,10
Total	359	4,09	0,05	360	3,47	0,04	360	3,44	0,04	364	3,18	0,04	359	2,87	0,05
P-value	0,69			0,00			0,00			0,00			0,00		

M*=Mean maximum of 5; SEM= Standard error of the mean; p-values indicate significant differences (p≤0,05)

Extrinsic attribute 1: Packaging

Gender, age and income

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in neither of the demographic categories mentioned above. Thus, one can conclude that neither gender, age nor income can be used to predict consumers prioritisation of the extrinsic attribute "packaging" when procuring bread.

Extrinsic attribute 2: Store image

Age

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in neither of the demographic categories mentioned above. Thus, one can conclude that age cannot be used to predict consumers prioritisation of the extrinsic attribute "store image" when procuring bread.

GENDER

TABLE 4.17: CONSUMER PRIORITISATION OF EXTRINSIC ATTRIBUTES IN TERMS OF STORE IMAGE IN RELATION TO GENDER

Store image (M=3,46)	Gender	N	Mean	SEM
	Male	170	3,59	0,06608
	Female	265	3,37	0,04517
	Total	435		
	P-value		0,02	

As illustrated in Table 4.16, ANOVA revealed the presence of significant differences between male and female (p=0,02) pertaining to prioritisation of store image. A T-test (Table 4.17) revealed that male respondents (M=3,59) tend to prioritise store image significantly more compared to female respondents (M=3,37). This is an interesting finding as women were known to be more interested in aesthetics than men in the retail market (Janse van Noordwyk, Du Preez & Visser, 2006).

INCOME

Results derived from the ANOVA in Table 4.16 showed the presence of significant differences amongst the six income groups (p=0,00). The subsequent Post-hoc Bonferroni test (Table 4.18) revealed that the lowest income group (earning below R6000)

tend to prioritise store image significantly more (M=3,75) compared to all of the other income groups who's means ranged between 3,26-3,31 (see table 4.18).

TABLE 4.18: CONSUMER PRIORITISATION OF EXTRINSIC ATTRIBUTES IN TERMS OF STORE IMAGE IN RELATION TO INCOME

Store Image (M=3,64)	Income	Income groups	Mean	Mean Difference	SEM	P-value
	<= 6000,00 (M=3,75)	6001,00 - 10000,00	3,54	0,21	0,17	1,000
		10001,00 - 20000,00	3,45	0,30	0,13	0,290
		20001,00 - 30000,00	3,26	0,49045*	0,13	0,004
		30001,00 - 50000,00	3,31	0,44283*	0,11	0,001
		50001,00 - 70833,33	3,26	0,49822*	0,14	0,009
	6001,00 - 10000,00 (M=3,54)	<= 6000,00	3,75	-0,21	0,17	1,000
		10001,00 - 20000,00	3,45	0,09	0,19	1,000
		20001,00 - 30000,00	3,26	0,28	0,19	1,000
		30001,00 - 50000,00	3,31	0,23	0,17	1,000
		50001,00 - 70833,33	3,26	0,29	0,20	1,000
	10001,00 - 20000,00 (M=3,45)	<= 6000,00	3,75	-0,30	0,13	0,290
		6001,00 - 10000,00	3,54	-0,09	0,19	1,000
		20001,00 - 30000,00	3,26	0,19	0,15	1,000
		30001,00 - 50000,00	3,31	0,14	0,13	1,000
		50001,00 - 70833,33	3,26	0,19	0,16	1,000
	20001,00 - 30000,00 (M=3,26)	<= 6000,00	3,75	-0,49045*	0,13	0,004
		6001,00 - 10000,00	3,54	-0,28	0,19	1,000
		10001,00 - 20000,00	3,45	-0,19	0,15	1,000
		30001,00 - 50000,00	3,31	-0,05	0,14	1,000
		50001,00 - 70833,33	3,26	0,01	0,17	1,000
	30001,00 - 50000,00 (M=3,31)	<= 6000,00	3,75	-0,44283*	0,11	0,001
		6001,00 - 10000,00	3,54	-0,23	0,17	1,000
		10001,00 - 20000,00	3,45	-0,14	0,13	1,000
		20001,00 - 30000,00	3,26	0,05	0,14	1,000
		50001,00 - 70833,33	3,26	0,06	0,15	1,000
	50001,00 - 70833,33 (M=3,26)	<= 6000,00	3,75	-0,49822*	0,14	0,009
		6001,00 - 10000,00	3,54	-0,29	0,20	1,000
		10001,00 - 20000,00	3,45	-0,19	0,16	1,000
		20001,00 - 30000,00	3,26	-0,01	0,17	1,000
		30001,00 - 50000,00	3,31	-0,06	0,15	1,000

This is interesting to note as literature presents that higher income consumers tend to be more aware of store image compared to lower income consumers due to a possible link between higher priced products and store atmosphere (Jere, Aderele & Jere, 2014). A possible reason for these contrasting results in this study might be due to the product investigated (i.e., bread) but also the time of the data collection, which was done during the pandemic. It might be that lower income consumers became more aware of store image during the pandemic due to safety reasons. A study done by Pacheco and Rahman (2015) shows that a positive store image can be linked to consumers having a positive perception towards the products carried in that store.

Extrinsic attribute 3: Price

Gender and age

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in neither of the demographic categories mentioned above. Thus, one can conclude that neither gender nor age can be used to predict consumers prioritisation of the extrinsic attribute “price” when procuring bread.

INCOME

Results derived from the ANOVA in Table 4.16 showed the presence of significant differences amongst the six income groups (p=0,00). The subsequent Post-hoc Bonferroni test (Table 4.19) revealed that the lowest income group (earning below R6000) as well as the middle income group (R10 000-R20 000), tend to prioritise price significantly more (M=3,62 & M=3,64) compared to the higher income and groups who presented means ranging between (M=3,20-M=3,22).

TABLE 4.19: CONSUMER PRIORITISATION OF EXTRINSIC ATTRIBUTES IN TERMS OF PRICE IN RELATION TO INCOME

Price (M=3,40)	Income	Income groups	Mean	Mean Difference	SEM	P-value
	<= 6000,00 (M=3,62)	6001,00 - 10000,00	3,55	0,0704	0,17	1,000
		10001,00 - 20000,00	3,64	-0,0207	0,13	1,000
		20001,00 - 30000,00	3,39	0,2308	0,13	1,000
		30001,00 - 50000,00	3,20	0,42465*	0,11	0,002
		50001,00 - 70833,33	3,22	0,3994	0,14	0,082
	6001,00 - 10000,00 (M=3,55)	<= 6000,00	3,62	-0,0704	0,17	1,000
		10001,00 - 20000,00	3,64	-0,0911	0,19	1,000
		20001,00 - 30000,00	3,39	0,1603	0,19	1,000
		30001,00 - 50000,00	3,20	0,3542	0,17	0,615
		50001,00 - 70833,33	3,22	0,3289	0,20	1,000
	10001,00 - 20000,00 (M=3,64)	<= 6000,00	3,62	0,0207	0,13	1,000
		6001,00 - 10000,00	3,55	0,0911	0,19	1,000
		20001,00 - 30000,00	3,39	0,2515	0,15	1,000
		30001,00 - 50000,00	3,20	0,44536*	0,13	0,015
		50001,00 - 70833,33	3,22	0,4201	0,16	0,152
	20001,00 - 30000,00 (M=3,39)	<= 6000,00	3,62	-0,2308	0,13	1,000
		6001,00 - 10000,00	3,55	-0,1603	0,19	1,000
		10001,00 - 20000,00	3,64	-0,2515	0,15	1,000
		30001,00 - 50000,00	3,20	0,1939	0,14	1,000
		50001,00 - 70833,33	3,22	0,1686	0,16	1,000
	30001,00 - 50000,00 (M=3,20)	<= 6000,00	3,62	-0,42465*	0,11	0,002
		6001,00 - 10000,00	3,55	-0,3542	0,17	0,615
		10001,00 - 20000,00	3,64	-0,44536*	0,13	0,015
		20001,00 - 30000,00	3,39	-0,1939	0,14	1,000
		50001,00 - 70833,33	3,22	-0,0253	0,15	1,000
	50001,00 - 70833,33 (M=3,22)	<= 6000,00	3,62	-0,3994	0,14	0,082
		6001,00 - 10000,00	3,55	-0,3289	0,20	1,000
		10001,00 - 20000,00	3,64	-0,4201	0,16	0,152
		20001,00 - 30000,00	3,39	-0,1686	0,16	1,000
		30001,00 - 50000,00	3,20	0,0253	0,15	1,000

This makes relative sense as low income households are often more risk averse, and therefore, select more economical foods (i.e., no name/ generic items, larger package sizes and lower quality items) in an effort to save money (Ailawadi, Neslin & Gedenk, 2001).

Extrinsic attribute 4: Brand

Gender and age

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in neither of the demographic categories mentioned above. Thus, one can conclude that neither gender nor age can be used to predict consumers prioritisation of the extrinsic attribute “brand” when procuring bread.

INCOME

Results derived from ANOVA in Table 4.16 showed the presence of significant differences amongst the six income groups (p=0,00). The subsequent Post-hoc Bonferroni test (Table 4.20) revealed that the lowest income group (earning below R6000) (M=3,41) prioritises brand significantly more (M=3,40) compared to the higher income group (R30 000-R50 000) (M=2,99).

TABLE 4.20: CONSUMER PRIORITISATION OF EXTRINSIC ATTRIBUTES IN TERMS OF BRAND IN RELATION TO INCOME

Brand (M=3,14)	Income	Income groups	Mean	Mean Difference	SEM	P-value
	<= 6000,00 (M=3,41)	6001,00 - 10000,00	3,39	0,01895	0,18372	1,000
		10001,00 - 20000,00	3,18	0,22647	0,13963	1,000
		20001,00 - 30000,00	3,03	0,37921	0,14352	0,129
		30001,00 - 50000,00	2,99	0,41541*	0,11800	0,007
		50001,00 - 70833,33	3,01	0,40252	0,15316	0,134
	6001,00 - 10000,00 (M=3,39)	<= 6000,00	3,41	-0,01895	0,18372	1,000
		10001,00 - 20000,00	3,18	0,20752	0,20163	1,000
		20001,00 - 30000,00	3,03	0,36026	0,20434	1,000
		30001,00 - 50000,00	2,99	0,39646	0,18730	0,525
		50001,00 - 70833,33	3,01	0,38357	0,21122	1,000
	10001,00 - 20000,00 (M=3,18)	<= 6000,00	3,41	-0,22647	0,13963	1,000
		6001,00 - 10000,00	3,39	-0,20752	0,20163	1,000
		20001,00 - 30000,00	3,03	0,15274	0,16583	1,000
		30001,00 - 50000,00	2,99	0,18894	0,14431	1,000
		50001,00 - 70833,33	3,01	0,17605	0,17424	1,000
	20001,00 - 30000,00 (M=3,03)	<= 6000,00	3,41	-0,37921	0,14352	0,129
		6001,00 - 10000,00	3,39	-0,36026	0,20434	1,000
		10001,00 - 20000,00	3,18	-0,15274	0,16583	1,000
		30001,00 - 50000,00	2,99	0,03620	0,14807	1,000
		50001,00 - 70833,33	3,01	0,02331	0,17737	1,000
	30001,00 - 50000,00 (M=2,99)	<= 6000,00	3,41	-0,41541*	0,11800	0,007
		6001,00 - 10000,00	3,39	-0,39646	0,18730	0,525
		10001,00 - 20000,00	3,18	-0,18894	0,14431	1,000
		20001,00 - 30000,00	3,03	-0,03620	0,14807	1,000
		50001,00 - 70833,33	3,01	-0,01288	0,15744	1,000
	50001,00 - 70833,33 (3,01)	<= 6000,00	3,41	-0,40252	0,15316	0,134
		6001,00 - 10000,00	3,39	-0,38357	0,21122	1,000
		10001,00 - 20000,00	3,18	-0,17605	0,17424	1,000
		20001,00 - 30000,00	3,03	-0,02331	0,17737	1,000
		30001,00 - 50000,00	2,99	0,01288	0,15744	1,000

These results might be due to the notion that lower income consumers are prone to pay more for branded products as they often view these products as superior (Sethuraman & Cole, 1999). Since these customers are aware that they have less to spend, they may want to ensure that the product that they purchase meets their needs and expectations.

Extrinsic attribute 5: Label

GENDER

As illustrated in Table 4.16, ANOVA revealed the presence of significant differences between male and female (p=0,04) pertaining to prioritisation of product labels.

TABLE 4.21: CONSUMER PRIORITISATION OF EXTRINSIC ATTRIBUTES IN TERMS OF LABEL IN RELATION TO GENDER

Label (M=2,82)	Gender	N	Mean	SEM
	Male	168	3,0525	0,07319
	Female	264	2,6745	0,05297
	Total	435		
	P-value		0,04	

A T-test (Table 4.21) revealed that male respondents (M=3,05) tend to prioritise product labels significantly more compared to female respondents (M=2,67). This is interesting as literature reviled that women tend to utilise food labels more than men (Stran & Knol, 2013). The results shown in Table 4.21 may be due to the shift in household shoppers during the pandemic as well as an increase in health concerns amongst the sample.

AGE

No significant difference could be confirmed (p>0,05) amongst the subsets of the data in the demographic category mentioned above. Thus, one can conclude that age cannot be used to predict consumers prioritisation of the extrinsic attribute “label” when procuring bread.

INCOME

Results derived from the ANOVA in Table 4.16 showed the presence of significant differences amongst the six income groups (p=0,00). The subsequent Post-hoc Bonferroni test (Table 4.22) revealed that the lowest income group (earning below R6000) tend to prioritise product labelling significantly more (M=3,15) compared to the middle income groups who presented respective means of (M=2,64 & M=2,66).

TABLE 4.22: CONSUMER PRIORITISATION OF EXTRINSIC ATTRIBUTES IN TERMS OF LABEL IN RELATION TO INCOME

Label (M=2,28)	Income	Income groups	Mean	Mean Difference	SEM	P-value
	<= 6000,00 (M=3,15)	6001,00 - 10000,00	3,16	-0,00907	0,19700	1,000
		10001,00 - 20000,00	2,79	0,35793	0,15192	0,285
		20001,00 - 30000,00	2,67	0,48114*	0,15406	0,029
		30001,00 - 50000,00	2,65	0,50260*	0,12684	0,001
		50001,00 - 70833,33	2,75	0,40222	0,16588	0,237
	6001,00 - 10000,00 (M=3,16)	<= 6000,00	3,15	0,00907	0,19700	1,000
		10001,00 - 20000,00	2,79	0,36700	0,21723	1,000
		20001,00 - 30000,00	2,67	0,49021	0,21874	0,385
		30001,00 - 50000,00	2,65	0,51167	0,20050	0,167
		50001,00 - 70833,33	2,75	0,41128	0,22721	1,000
	10001,00 - 20000,00 (M=2,79)	<= 6000,00	3,15	-0,35793	0,15192	0,285
		6001,00 - 10000,00	3,16	-0,36700	0,21723	1,000
		20001,00 - 30000,00	2,67	0,12321	0,17921	1,000
		30001,00 - 50000,00	2,65	0,14467	0,15643	1,000
		50001,00 - 70833,33	2,75	0,04428	0,18946	1,000
	20001,00 - 30000,00 (M=2,67)	<= 6000,00	3,15	-0,48114*	0,15406	0,029
		6001,00 - 10000,00	3,16	-0,49021	0,21874	,385
		10001,00 - 20000,00	2,79	-0,12321	0,17921	1,000
		30001,00 - 50000,00	2,65	0,02146	0,15851	1,000
		50001,00 - 70833,33	2,75	-0,07893	0,19119	1,000
	30001,00 - 50000,00 (M=2,65)	<= 6000,00	3,15	-0,50260*	0,12684	0,001
		6001,00 - 10000,00	3,16	-0,51167	0,20050	0,167
		10001,00 - 20000,00	2,79	-0,14467	0,15643	1,000
		20001,00 - 30000,00	2,67	-0,02146	0,15851	1,000
		50001,00 - 70833,33	2,75	-0,10038	0,17002	1,000
	50001,00 - 70833,33 (M=2,75)	<= 6000,00	3,15	-0,40222	0,16588	0,237
		6001,00 - 10000,00	3,16	-0,41128	0,22721	1,000
		10001,00 - 20000,00	2,79	-0,04428	0,18946	1,000
		20001,00 - 30000,00	2,67	0,07893	0,19119	1,000
		30001,00 - 50000,00	2,64	0,10038	0,17002	1,000

This is interesting as consumers with a higher education and specifically income are often more interested in food labels (Wolla & Sullivan, 2017). Therefore low income groups, whom are at a greater risk of poor health outcomes, are less likely to use food labels (Pérez-Escamilla & Haldeman, 2002).

4.2.3 Identified market opportunities based on information pertaining to consumers' likelihood to adopt alternative bread options (objective 3)

Consumers have various motives for purchasing and consuming food products (Tobler, Visschers & Siegrist, 2011). To identify consumers likelihood to adopt alternative bread options, respondents were asked to indicate the likelihood of them purchasing a selection of alternative bread products (Section D in questionnaire). A 5-point Likert-type likelihood

scale was used, with 1= extremely likely and 5 = extremely unlikely. This was done in order to identify possible marketing opportunities within the targeted product category.

Means were interpreted as follows M ≥ 5: extremely unlikely, M4<5: somewhat unlikely, M3<4: neither likely nor unlikely, M2<3: somewhat likely, M<2 = extremely likely. Means lower than 3,5 were considered as areas that could possibly indicate market opportunities (these products are highlighted in red).

TABLE 4.23: LIKELINESS TO PURCHASE AND CONSUME BREAD ALTERNATIVES - CONSUMERS' LIKELINESS TO PURCHASE AND CONSUME ALTERNATIVE BREAD PRODUCTS ON A REGULAR BASIS

	N	Mean	Median	Rank	Mode	% of respondents who reported that they were extremely likely to buy and consume the following products
Wraps	450	2,16	2,00	1	1	36,4
Roti	448	2,63	2,00	2	2	26,1
Organic bread products	450	2,82	3,00	3	2	18,7
Pan bread	450	2,92	3,00	4	2	18,9
Plant-based bread products	450	3,04	3,00	5	2	16,4
Wheat-free bread products	458	3,07	3,00	6	5	20,1
Sorghum-based bread products	471	3,51	4,00	7	5	9,3
Rice-based bread products	452	3,53	4,00	8	5	9,5
Bread products suitable for banting	456	3,54	4,00	9	5	11,2
Cassava-based bread products	450	3,74	4,00	10	5	6,0

According to Table 4.23 areas which may be considered for market opportunities within the bread product category are as follows: wraps (M=2,16); roti (M=2,63); organic bread products (M=2,82); pan bread (M=2,92); plant-based bread products (M=3,04) and wheat free bread products (M=3,07). The reason that the rest (e.g. Cassava-based bread products M=3,74) scored poorer might be contributed to the fact that these products might be viewed as "unfamiliar" but also less available to respondents. Therefore, many South African consumers might be under the impression that "healthier" food products are less tasty and less filling (Manohar, Rehman & Sivakumaran, 2021).

In support of the findings presented above respondents where then also asked to provide possible reasons why previously they might have been reluctant to buy alternative bread options. This question could be answered in text. Figure 4.12 presents a word cloud illustrating the most prominent answers.

FIGURE 4.12: CONSUMERS REASON FOR NOT PURCHASING AND CONSUMING ALTERNATIVE BREAD PRODUCTS

According to the word cloud above, it is apparent that the sample's main concerns for purchasing and consuming possible alternative bread products are firstly choice, followed by availability and affordability. Deeper investigation of verbatim data revealed that respondents stated, "They are not my preferred choice", "They are not readily available in my area" and "They tend to be more expensive". Some of the respondents mentioned that they are unfamiliar with these products, and they would prefer to consume and purchase regular wheat bread options. Overall it could be summarized that the main reason for non-adoption of the alternative bread options mainly relates to accessibility, mentioning that these alternative bread products are not necessarily available in stores.

4.3 CONCLUSION

The results were gathered by implementing quantitative data collection techniques. The results for this study were presented according to the objectives. Research focused on consumers' prioritisation of important product attributes and willingness to adopt more sustainable bread options.

The study had a sample of 447 respondents in total. For this study, most respondents were female (60,4%, n=270). This was an expected outcome as women are known for being more open to trying new foods (Ozgen, 2014) and women are known as the primary shoppers in South Africa (Kempen & Tobias-Mamina, 2022). Results revealed that almost half (42%) of respondents tend to buy bread products at least once a week.

It is evident that most of the selected retailers for this study are well stocked in terms of bread assortment. It is known that bread products on the shelves demonstrate attributes relating to pleasure and convenience, it is also noted that bread products containing attributes relating to health and wellness are becoming increasingly prominent on shelves in the retail market. These “healthier” options seem to be purchased less by the sample although the preference to purchase these products are shown to be relatively high, which could suggest that an appetite for these alternatives may exist but the current store offerings might not match the needs and wants of the consumers.

In terms of prioritisation of intrinsic and extrinsic product attributes it was clear that intrinsic attributes were prioritised by the sample. These attributes seemed to be impacted greatly by the pandemic as core attributes pertaining to bread such as taste and aroma were indicated as significantly less important than food safety due to the heightened concern of hygiene during this time.

Chapter 5

CONCLUSION AND RECOMMENDATIONS

This chapter begins with a summary of the key findings pertaining to the main objectives. It is envisaged that the conclusions drawn could guide the revision of current bread category management practices within a retail-based environment and possibly support the future introduction of more sustainable bread options on the South African bread market. The chapter concludes with a discussion regarding the limitations of the study along with recommendations for any further investigation.

5.1 INTRODUCTION

It is said that customer preferences is a major driver in terms of product development and that meeting these preferences is essential in terms of the success of food industries such as the modern bread market (Zhou, Semumu & Gamero, 2021).

Consumer preferences have a wide reach that impacts various value chain members from farm to fork, (often resulting in competitive markets). For this reason, it is essential for supply chain stakeholders in South Africa to understand consumer preferences as well as consumer's willingness to purchase alternative bread products. It is essential for these industry stakeholders to understand the consumer decision making processes and keep track of which attributes are prioritised within this product category (Torelli & Shavitt, 2022). This understanding and consequential development could aid in differentiating and achieving a competitive advantage. The knowledge and results presented in this study may thus aid respective industries in identifying market opportunities and hence could increase sales within this product category. In essence it is envisaged that conclusions drawn from this study may aid in identifying various product related attributes which may assist in the development and introduction of alternative, possibly more sustainable bread options (i.e., made from climate smart crops) to the market.

5.2 CONCLUSIONS REACHED PER OBJECTIVE

5.2.1 The current South African bread market (objective 1)

Modern-day diets consist of refined wheat-based bread products which often feature as the number one convenient staple (Misra, Singhal, Sivakumar, Bhagat, Jaiswal & Khurana, 2011). The South African market offers a variety of bread products on the market. The bread market is constantly growing with a variety of alternatives in order to keep up with consumer trends as well as consumer needs and wants. Consumers seem to want to be concerned with sustainability (in terms of health as well as the sustainability of the environment) (Polimeni, Iorgulescu & Mihnea, 2018), although outside influences such as affordability, availability, accessibility and familiarity seem to influence the decisions ultimately made by them.

Consumption of refined wheat-based bread products does very little in terms of proper nutrition, health and one's wellbeing (De Punder & Pruimboom, 2013). Wheat-based bread products might also be a concern due to wheat's heavy reliance on water which is greatly threatened by climatic change (Akram, 2011). Due to consumers becoming more aware of concerns as raised above as well as the impact thereof on their own health and wellbeing, industries such as those supplying food products need to pay attention. Acknowledging these concerns and consequential consumer trends will not only satisfy consumer needs but could potentially result in attaining positive market growth.

Objective one in this study aimed at investigating the South African bread market in terms of current popular trends and product offerings. Results pertaining to **visible trends** revealed that the respective retailers included in this study presented three popular trends i.e. convenience; pleasure; and health and wellness. Within the retail market it is crucial that consumer trends are visible on the shelves, in order to attract consumer attention and satisfy underlying needs and wants that they might have in terms of products (Van Gijssel, 2005). Products displayed numerous marketing strategies in order to persuade consumers to purchase the various products. For example bread products portraying convenience would display terms such as "pre-sliced" and "heat & eat". It was interesting to note that although the convenience and pleasure trends was well represented in stores, the health and wellness trend was not as visible, which might be due to the specific product category.

In terms of **product assortment**, results revealed that the respective retail stores are well stocked and carry a wide range of bread products that includes four main categories i.e. regular wheat options, artisanal, multigrain and health and wellness.

Results did however highlight that the health and wellness category is currently an area that could benefit from further investigation as this category is still limited in terms of the options available (i.e. a wider variety or alternative grain bread products could thus be considered and introduced). As a result of this, it is understandable that some studies conclude that consumers often struggle to maintain health and wellbeing through food products such as bread due to limited availability (Mayosi, Flisher, Lalloo, Sitas, Tollman & Bradshaw, 2009). Regarding the sustainability aspect of wheat's heavy reliance on water, introducing innovative, more sustainable bread options is a matter of importance.

5.2.2 Consumers' current purchasing behaviour and preferences pertaining to bread products (objective 2)

Many households in South Africa use bread as a convenient and versatile food item as it may be consumed for any meal and is a relatively budget friendly alternative (Moula, 2006). Objective 2 aimed at exploring and describing consumers' current purchasing behaviour and preferences pertaining to bread products. This allowed first and foremost for the identification of possible discrepancies between actual buying and preferred purchasing practices that highlight new market opportunities. Previous literature has noted that consumers often purchase one product even though they might favour or prefer another (Dolšak, Hrovatin & Zorić, 2020). Identification of these patterns not only allows for better product alignment and consumer targeting but could also reveal possible market opportunities. Secondly it also allowed for the identification of intrinsic and extrinsic product attributes that could be instrumental in terms of altering current product offerings as well as the introduction of new bread products with the aim to better satisfy consumer needs.

A comparison between the results pertaining to respondents' actual versus preferred purchasing practices revealed discrepancies in terms of product categories and assortment. Findings showed that even though respondents currently resort to purchasing traditional regular wheat (white and brown) bread options, their preferences, not only in terms of product category but also assortment, direct towards bread options

that present attributes that could be considered as more wholesome and possibly sustainable (i.e., there is a greater preference for freshly baked, multigrain that include climate smart crops, sourdough etc). With regard to actual purchasing versus preferences there was definite preference for bread which is outside regular/ traditional wheat options. The study showed that respondents preferences differ greatly in comparison to their purchasing practices with 9 out of the 14 products presenting a difference greater than 20%. For this reason, it could be argued that based on consumer preferences there is in fact a scope for introducing alternative and more sustainable products into the bread market that fit characteristics of assortments such as multi grain, ancient grains, seeded, sourdough, low GI, high protein and high fibre. These products presented differences greater than 20% when compared to actual buying. Interestingly gluten free bread products show only a slight difference.

In terms of respondents' prioritisation pertaining to selected intrinsic and extrinsic product attributes findings revealed that when purchasing bread respondents tend to prioritise intrinsic over extrinsic product attributes with food safety, taste and nutritional value highlighted as the top three intrinsic attributes. It is therefore the opinion of this study that these attributes should be carefully considered during the development, launching or placement of new/ future bread alternatives. Noteworthy findings from ANOVA done in this study also call attention to careful consideration of specific demographic characteristics when planning to introduce new bread offerings. Findings indicated that in terms of prioritisation of product specific attributes age, gender and income played a significant role. In terms of age, product developers and or retailers should consider that although both younger and older respondents favour healthier options, results indicate that younger respondents might be more adventurous opting for offerings that include more sustainable options made from climate smart crops, flatbreads and artisanal options.

In terms of gender, retail stores and product developers should focus on both males and females when marketing or positioning new bread products. As research revealed that male respondents tend to prioritise store image (which is an interesting finding as previous research reveals that women are known to be more interested in aesthetics than men (Janse van Noordwyk *et al.*, 2006). Product developers should ensure that food labels are not only targeted towards women but to men too.

With regard to income, findings indicated that consumers with a lower income tend to prioritise attributes such as texture, processing technique, aroma, price and labelling. Product developers and retailers should consider placing more importance on lower income groups when introducing innovative and possibly more sustainable products (possible replacement of the well-known traditional wheat-based “government loaf”) as lower income consumers consume core staples such as bread almost every day. These consumers may therefore be drastically impacted with changes in the above-mentioned attributes.

5.2.3 Possible market opportunities for alternative bread options (objective 3)

It is essential that innovative, sustainable and “healthier” alternatives are introduced into the market (more affordable, available and acceptable healthier bread options) in order to promote or shift the change for healthier lifestyles in South Africa (Spires, Delobelle, Sanders, Puoane, Hoelzel & Swart, 2016). Due to the rise in non-communicable diseases as well as concerns about climate changes, finding innovative ways to nudge consumers towards more sustainable behaviour is non-negotiable. Understanding consumer engagement with this specific product category could reveal possible market opportunities for various value chain members and hence contribute towards a more sustainable food system. By investigating consumer preferences, actual consumption and willingness to adopt alternative bread options, this study anticipated to enable product developers to amend current product offerings which could be beneficial in terms of the health and wellbeing of future generations.

Overall results from this study revealed that there is definite appetite (albeit niche) for alternative bread options, such as those produced from climate smart crops. It was however inferred that launching these products into the current bread market needs careful planning as these products have to be reasonably priced, easily accessible / available and should carry some familiar characteristics (e.g. be in formats such as Roti and Wraps that are more familiar). Results did present proof that consumers often have a higher risk perception when it comes to new, alternative products. They will also refrain from buying these products if the products present too many attributes that are out of the norm. Results from ANOVAS did reveal that younger, female, middle to higher income consumers could be targeted as these consumers seem to be more adventurous and could be viewed as first adopters.

5.3 RESEARCH IN RETROSPECT

It is essential for the researcher to evaluate the research objectively once the investigation has been completed. This is done to ensure that all of the objectives set for the study have been met accordingly. When considering refined wheat products, it is essential that the health of consumers as well as the sustainability is maintained. The increase in non-communicable diseases and drought in South Africa contributes to the unsustainability of refined-wheat bread products in the country. Turning a blind eye to this two-fold problem is no longer an option and hence product developers and retailers need to consider reviewing and amending current bread offerings in order to provide offerings that could be considered as more sustainable.

Limited research has been done on this topic in the past. The research on hand focuses on consumer preferences and actual consumption along with prioritisation of important product attributes of bread products in South Africa. The research aimed to determine consumers' willingness to adopt more sustainable alternatives. With this in mind, the problem statement, objectives and conceptual framework for this study were formulated.

In terms of methodology (which was presented in Chapter 3), measurements were taken in order to ensure the reliability and validity of the study. The RMA was used to aid/ guide the study and provide a snapshot of the market status for bread products. Since the study followed a quantitative approach, primary data was collected in two phases making use of a MQS, along with a structured questionnaire which was distributed via a Qualtrics link. Primary data was collected through store observation and making use of online sources. In terms of the questionnaire the respondents could complete the questionnaire in their own time which allowed the respondents to take their time in answering the questions accurately and responsibly. The questionnaire contained a cover letter addressed to the respondents which took part in the study. The cover letter contained elements which highlighted the aim of the study as well as the researcher's association with the University of Pretoria. It was highlighted that all information collected during the duration of the study was confidential. The respondents were recruited through convenience sampling and all participated voluntarily which aided in the reliability of the study. Convenience sampling, a non-probability sampling technique, is often used due to time and financial limitations (Etikan, 2016), which made this technique suitable for the study on hand.

5.3.1 Achievement of the objectives set out for this research

The objectives for the study on hand were attended to satisfactorily. The drawn conclusions were relevant to the study and reflected the main objectives which were formulated for the study. No unexpected complications were identified regarding the study as a whole (observations, data collection or the questionnaire). One slight issue identified, was the ongoing COVID-19 pandemic which interrupted in-store observations for the first phase of the study which resulted in supplementing the in-store with online observations. It is believed that the results obtained from this study presents relevant literature about consumers' current consumption, preferences and prioritisation of product specific attributes as well as their willingness to adopt alternative bread options in South Africa. It is further believed that the findings could aid product developers and retailers to not only review current product offerings in order to amend but also introduce new innovative offerings with greater success by targeting specific consumer groups.

5.4 LIMITATIONS OF THE STUDY

In order to obtain data which is ethical, accurate and reliable, it was vital for the researcher to follow thorough research methods. The study was restricted by certain inevitable limitations which, when evaluated, could serve as guidance for future research:

1. Due to financial and time constrains, data collection for the study was restricted to making use of convenience sampling, therefore only voluntary respondents were obtained. Additional funding could ensure the inclusions of other provinces in South Africa which may represent a more accurate sample.
2. For this study, the respondents needed to be 21 years or older. This restricted the audience to the primary member responsible for food preparation and therefore excluded awareness and participation of members who were not directly involved in household practices such as food preparation and shopping.
3. Five main retailers were selected for observation through the Market Quick Scan. This limited research of smaller (i.e., independent retailers) as well as the restaurant industry.
4. In-store observations as well as online sources were used to complete a Market Quick Scan. The COVID-19 pandemic prevented a complete analysis of the selected retail stores.

5.5 RECOMMENDATIONS FOR FUTURE RESEARCH

This study aimed at providing empirical evidence regarding consumers' prioritisation of selected product attributes when purchasing bread as well as the implication in terms of their ultimate willingness to adopt alternative (possibly more sustainable) bread options. Even though the topic of consumer preferences and prioritisation of intrinsic and extrinsic attributes are not a new one and have been investigated extensively in other countries the issue has to date received limited attention within the context of the South African bread market.

The study identified following recommendations for future research:

- Future studies can be done with focus on the availability of alternative bread products on the market. This could give future researchers a more in-depth snapshot of the "wheat-free" market.
- Researchers can focus on sensory experiences (intrinsic and extrinsic product attributes) of alternative/ more sustainable bread products.
- Due to the large impact made on consumer prioritisation during the pandemic, qualitative studies may be done (i.e. focus groups) to understand certain attributes which in this study presented significant different results when compared to previous pre-COVID studies, i.e. aroma, food safety and packaging.
- This study may be repeated in 5 years' time to identify if the pandemic in fact played a role in the prioritisations of the product attributes.

5.6 FINAL CONCLUSION

Results from this study confirmed that despite the South African bread market presenting a wide assortment of bread options, current consumer behaviour still sway towards regular, more familiar wheat alternatives, which is not necessarily deemed as sustainable. It should however, be emphasised that not all hope is lost, as results from consumers' preferences significantly differed from their actual consumption and showed that there is definitely an appetite for more sustainable bread options (especially when consumers' needs are acknowledged during the developing process). Introducing or launching of these alternative products should, therefore, be done with caution. Results emphasised that to launch these new / alternative products successfully, bread products should echo

characteristics and trends that are somewhat familiar, e.g. sourdough, low GI, high protein, rich in fibre and presents formats such as wraps and roti's. Launching these options as possible line extensions of well-established trusted brands and or retailers is also a good idea. Targeting younger, females falling into the middle to higher income groups should also be considered as they are most likely the consumer group that will respond more favourably to these alternative bread options. Not only because they make up a large portion of the current grocery shoppers in South Africa, but also since they are the nurturers of tomorrows consumer, which is comforting to recognise in terms of sustainability.

In conclusion, it is essential that current bread product offerings are reviewed as the bread industry can no longer ignore the issues related with these current offerings. It is time to acknowledge the role played by the bread industry in order to foster a food system which nudges, encourages and supports consumers to adopt climate smart alternatives which are sustainable not only in terms of the natural environment but also society in general.

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Addendum A

INFORMED CONSENT

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

SOUTH AFRICAN CONSUMERS' PREFERENCES FOR SUSTAINABLE BREAD ALTERNATIVES

Informed consent form

Dear respondent

The purpose of this study is to gain insight into consumer's preferences for sustainable bread alternatives. This study is interested in your current consumption and preferences with regards to bread products. Additionally, the study aims to determine your willingness to purchase sustainable bread alternatives as an additional option. We would like to use the information gained to provide information to *Nutrifoods* and South African retailers in order to find out if sustainable bread alternatives are needed on the market. Thank you for taking the time to share your perspective regarding this study.

As a participant taking part in this study, you will be asked to complete several questions about yourself. Additionally, you will be asked to complete several questions pertaining to your preferences of bread products which aims to understand more about your **preference** when buying and consuming bread. Consumers preferences are often different from their actual buying patterns. Lastly, you will be asked to answer questions pertaining to your current bread consumption which aims at understanding more about your current/ **actual** buying and consumption behavior pertaining to bread. Your answers will be kept confidential and will only be used for the purpose of this study. Your identity will be kept anonymous. The survey will take approximately 10 minutes to complete. You are welcome to refrain from answering any of the questions that cause discomfort or infringement on your privacy. Additionally, you may stop the survey at any time without penalty. Please note that your participation in this research is completely voluntary and does not release the researchers or institution from their legal and professional responsibilities.

Your decision to respond to the questions will be interpreted as confirmation that you have agreed to participate in this study.

Kind regards
Principle researcher: Taryn Kotze
Supervisor: Nadene Marx-Pienaar
Co-supervisor: Gerrie Du Rand

Addendum B

QUESTIONNAIRE

Please tick one of the following boxes as an agreement of your participation

yes ○ no ○

Demographics

What is your gender?

- ○ Male
- ○ Female
- ○ Other

How old are you?

21 25 30 34 39 43 47 52 56 61 65

Age

In terms of the Employment Equity Act, which population group do you belong to?

- ○ Black African
- ○ Indian/ Asian
- ○ Coloured
- ○ White

What is your highest level of education

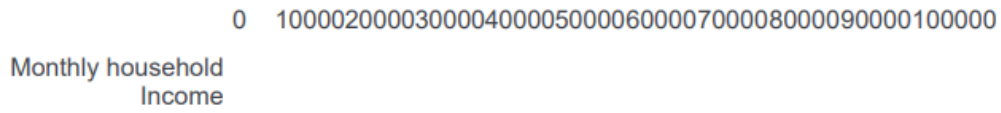
- ○ Lower than Grade 12
- ○ Grade 12 completed
- ○ University completed
- ○ Postgraduate completed

Please indicate your area of residence within Gauteng (e.g. Pretoria, Hatfield)

What is your home language

- English
- isiZulu
- Afrikaans
- Sepedi
- Sesotho
- Setswana
- siSwati
- Tshivenda
- Xitsonga
- isiNdebele
- isiXosa

What is your approximate total monthly household income rounded up to the nearest R1000



What is your marital status?

- Single/unmarried
- Married/ living with a partner
- Divorced/ widowed

How many people currently live in your household?

1 3 5 7 9 11 12 14 16 18 20

1 3 5 7 9 11 12 14 16 18 20

Number of people

How many dependent children are currently living in your household

0 1 2 3 4 5 6 7 8 9 10

Number of children

Who is responsible for the grocery shopping in the household?

- ○ Myself
- ○ Spouse/partner
- ○ Sibling/ roommate
- ○ _____ Other

How many times per month do you purchase bread products?

0 5 10 15 20 25 30 35 40 45 50

purchases

Consumer Preferences

The following section aims at understanding more about your **preference** when buying and consuming bread. **Consumer preferences are often different from their actual buying patterns**. It is therefore important for us as researchers to identify the existence of differences in order to amend current retail offerings and hence optimize future consumer satisfaction.

Please indicate which of the following bread categories you would **prefer** to buy:

	Prefer a great deal	Prefer a lot	Prefer a moderate amount	Prefer slightly	Do not prefer
Unsliced bread loaves	○	○	○	○	○
Sliced bread loaves	○	○	○	○	○
Rolls & Buns	○	○	○	○	○
Specialty bread	○	○	○	○	○
Heat & Eat bread	○	○	○	○	○
Wraps, Naan, Pita & Flatbread	○	○	○	○	○
Freshly baked bread	○	○	○	○	○
Other	○	○	○	○	○

Please indicate which of the following bread brands you would **prefer** to buy

	Prefer a great deal	Prefer a lot	Prefer a moderate amount	Prefer slightly	Do not prefer
Albany	○	○	○	○	○
Sasko	○	○	○	○	○
Blue Ribbon	○	○	○	○	○
Futurelife	○	○	○	○	○
Anat	○	○	○	○	○
Sunbake	○	○	○	○	○
Blue Shirt Bakery	○	○	○	○	○
Fresh Earth	○	○	○	○	○
House brands (eg. Pick n' Pay No Name, Spar Freshline or Woolworths)	○	○	○	○	○
Freshly baked directly from bakeries	○	○	○	○	○
Nizza Foods	○	○	○	○	○
Wheatfields	○	○	○	○	○
Banting Revolution	○	○	○	○	○
Calorie Conscious	○	○	○	○	○
Dutch Bakery	○	○	○	○	○
Other	○	○	○	○	○

Please indicate which of the following bread lines you would **prefer** to buy:

	Prefer a great deal	Prefer a lot	Prefer a moderate amount	Prefer slightly	Do not prefer
White bread	○	○	○	○	○
Brown bread	○	○	○	○	○
Best of both	○	○	○	○	○
Gluten free	○	○	○	○	○
Multigrain	○	○	○	○	○
Other	○	○	○	○	○

Please indicate which of the following bread types you would **prefer** to buy

	Prefer a great deal	Prefer a lot	Prefer a moderate amount	Prefer slightly	Do not prefer
Rye	○	○	○	○	○
Low GI	○	○	○	○	○
High fibre	○	○	○	○	○
High protein	○	○	○	○	○
Ciabatta	○	○	○	○	○
Sweet breads (eg. Banana Bread & Brioche)	○	○	○	○	○
Sour dough	○	○	○	○	○
Seeded bread	○	○	○	○	○
Other	○	○	○	○	○

Please indicate which of the following characteristics you would **prefer** when buying bread:

	Prefer a great deal	Prefer a lot	Prefer a moderate amount	Prefer slightly	Do not prefer
Gluten free	○	○	○	○	○
Kj controlled	○	○	○	○	○
Flavoured bread	○	○	○	○	○

	Prefer a great deal	Prefer a lot	Prefer a moderate amount	Prefer slightly	Do not prefer
low fat, low sugar, low carbohydrate, low calories, low cholesterol	○	○	○	○	○
Bread free from artificial preservatives, colourants, GMO's and trans fats	○	○	○	○	○
Convenience bread	○	○	○	○	○
Bread suitable for diabetics	○	○	○	○	○
Banting	○	○	○	○	○
Plant based bread products	○	○	○	○	○
Long lasting bread products	○	○	○	○	○
Heat and eat bread products	○	○	○	○	○
Taste of white but nutrition of brown bread	○	○	○	○	○
Smoothness of white but nutritional value of wholegrain bread	○	○	○	○	○
Other	○	○	○	○	○

Please indicate where you would **prefer** to buy bread:

	Prefer a great deal	Prefer a lot	Prefer a moderate amount	Prefer slightly	Do not prefer
Local bakeries	○	○	○	○	○
Spar	○	○	○	○	○
Checkers	○	○	○	○	○
Pick n' Pay	○	○	○	○	○
Dischem	○	○	○	○	○
Woolworths	○	○	○	○	○
Other	○	○	○	○	○

Please indicate how many servings of bread would you **prefer** to consume per day:

	Prefer a great deal	Prefer a lot	Prefer a moderate amount	Prefer slightly	Do not prefer
One serving a day	○	○	○	○	○
Two servings a day	○	○	○	○	○
Three servings a day	○	○	○	○	○
Four or more servings a day	○	○	○	○	○

Current Consumption

Compared to the previous section which investigated preferences, the following section aims at understanding more about your current / **actual** buying and consumption behavior pertaining to bread.

Please indicate which of the following bread categories you currently buy:

	Always	Most of the time	About half the time	Sometimes	Never
Unsliced bread loaves	○	○	○	○	○
Sliced bread loaves	○	○	○	○	○
Rolls & Buns	○	○	○	○	○
Specialty bread	○	○	○	○	○
Heat & Eat bread	○	○	○	○	○
Wraps, Naan, Pita & Flatbread	○	○	○	○	○
Freshly baked bread	○	○	○	○	○
Other	○	○	○	○	○

Please indicate which of the following bread brands you currently buy

	Always	Most of the time	About half the time	Sometimes	Never
Albany	○	○	○	○	○
Sasko	○	○	○	○	○
Blue Ribbon	○	○	○	○	○
Futurelife	○	○	○	○	○

	Always	Most of the time	About half the time	Sometimes	Never
Anat	○	○	○	○	○
Sunbake	○	○	○	○	○
Mastermacher	○	○	○	○	○
Fresh Earth	○	○	○	○	○
House brands (eg. Pick n' Pay No Name, Spar Freshline or Woolworths)	○	○	○	○	○
Freshly baked directly from bakeries	○	○	○	○	○
Nizza Foods	○	○	○	○	○
Wheatfields	○	○	○	○	○
Banting Revolution	○	○	○	○	○
Calorie Conscious	○	○	○	○	○
Dutch Bakery	○	○	○	○	○
Other	○	○	○	○	○

Please indicate which of the following bread lines you currently buy:

	Always	Most of the time	About half the time	Sometimes	Never
White bread	○	○	○	○	○
Brown bread	○	○	○	○	○
Best of both	○	○	○	○	○
Gluten free	○	○	○	○	○
Multigrain	○	○	○	○	○
Other	○	○	○	○	○

Please indicate which of the following bread types you most currently buy:

	Always	Most of the time	About half the time	Sometimes	Never
Rye	○	○	○	○	○
Low GI	○	○	○	○	○
High fibre	○	○	○	○	○
High protein	○	○	○	○	○

	Always	Most of the time	About half the time	Sometimes	Never
Ciabatta	O	O	O	O	O
Sweet breads (eg. Banana Bread & Brioche)	O	O	O	O	O
Sour dough	O	O	O	O	O
Seeded bread	O	O	O	O	O
Other	O	O	O	O	O

Please indicate which of the following characteristics you currently consider when buying bread:

	Always	Most of the time	About half the time	Sometimes	Never
Gluten free	O	O	O	O	O
Kj controlled	O	O	O	O	O
Flavoured bread	O	O	O	O	O
low fat, low sugar, low carbohydrate, low calories, low cholesterol	O	O	O	O	O
Bread free from artificial preservatives, colourants, GMO's and trans fats	O	O	O	O	O
Convenience bread	O	O	O	O	O
Bread suitable for diabetics	O	O	O	O	O
Banting	O	O	O	O	O
Plant based bread products	O	O	O	O	O
Long lasting bread products	O	O	O	O	O
Heat and eat bread products	O	O	O	O	O
Taste of white but nutrition of brown bread	O	O	O	O	O
Smoothness of white but nutritional value of wholegrain bread	O	O	O	O	O

Please indicate the retailer where you currently buy bread:

	Always	Most of the time	About half the time	Sometimes	Never
Local bakeries	○	○	○	○	○
Spar	○	○	○	○	○
Checkers	○	○	○	○	○
Pick n'Pay	○	○	○	○	○
Dischem	○	○	○	○	○
Woolworths	○	○	○	○	○
Other	○	○	○	○	○

Please indicate how many servings of bread you currently consume per day

	Always	Most of the time	About half the time	Sometimes	Never
One serving a day	○	○	○	○	○
Two servings a day	○	○	○	○	○
Three servings a day	○	○	○	○	○
Four or more servings a day	○	○	○	○	○

Product Related Attributes Consumer Prioritisation

Please indicate the level of importance for each of the following product attributes when evaluating bread products.

	Not at all important	Of little importance	Moderately important	Very important	Absolutely essential
High quality products in store	○	○	○	○	○
Exclusivity of Brand	○	○	○	○	○
Familiar processing technique	○	○	○	○	○
Appealing taste	○	○	○	○	○
Uncomplicated processing technique	○	○	○	○	○

	Not at all important	Of little importance	Moderately important	Very important	Absolutely essential
High nutritional value	○	○	○	○	○
Brand reliability	○	○	○	○	○
Informative label	○	○	○	○	○
Flavoursome taste	○	○	○	○	○
Best before date	○	○	○	○	○
Natural ingredients	○	○	○	○	○
Good-value pricing	○	○	○	○	○
Nutritional value	○	○	○	○	○
Low price	○	○	○	○	○
Stock avalibility in store	○	○	○	○	○
Trendy Brand	○	○	○	○	○
Safe quality	○	○	○	○	○
Discounted price	○	○	○	○	○
Wheat Aroma	○	○	○	○	○
Fresh appearance	○	○	○	○	○
Reasonable price	○	○	○	○	○
Creative label	○	○	○	○	○
Brand Distinctiveness	○	○	○	○	○
Fresh taste	○	○	○	○	○
Toasted Aroma	○	○	○	○	○
Familiar Brands	○	○	○	○	○
Attractiveness of Brand	○	○	○	○	○
No added preservatives	○	○	○	○	○
Simple label	○	○	○	○	○
Sweet Aroma	○	○	○	○	○
Brand Quality	○	○	○	○	○
Safe source	○	○	○	○	○
Safe packaging	○	○	○	○	○
Healthy ingredients	○	○	○	○	○
Sell buy date	○	○	○	○	○
Striking label	○	○	○	○	○
Natural processing technique	○	○	○	○	○

	Not at all important	Of little importance	Moderately important	Very important	Absolutely essential
Organic processing technique	○	○	○	○	○
Unique label	○	○	○	○	○
Contain the average nutrient recommended dietary allowance	○	○	○	○	○
Hygienic packaging	○	○	○	○	○
Expiry date	○	○	○	○	○
Smooth texture	○	○	○	○	○
Nutritional taste	○	○	○	○	○
Minimal human handeling during production	○	○	○	○	○
Store image	○	○	○	○	○
No added colourants	○	○	○	○	○
Appealing size	○	○	○	○	○
Higher price	○	○	○	○	○
Refreshing taste	○	○	○	○	○
Appealing colour	○	○	○	○	○
Locally produced	○	○	○	○	○
Safe to consume	○	○	○	○	○
Innovative processing technique	○	○	○	○	○
Storage condition	○	○	○	○	○
Positive visual appearance	○	○	○	○	○
Yeast Aroma	○	○	○	○	○
Added-preservatives	○	○	○	○	○
Fresh quality	○	○	○	○	○
Natural taste	○	○	○	○	○
Attractively in-store merchandising	○	○	○	○	○

Please rank the following product attributes in terms of importance when evaluating bread products. Number them in order of importance, where 1 indicates the most important attribute, and 8 indicates the least important of the attributes listed. Please rank each attribute by dragging and dropping the attribute in the order that suits you.

Taste

Visual appearance

Processing / production technique

Aroma

Label

Price

Food safety

Nutritional Value

Ingredients

Store Image

Branding

Packaging

Texture

Willingness to purchase

Please indicate how likely you are to purchase and consume the following bread products on a regular basis:

	Extremely likely	Somewhat likely	Neither likely nor unlikely	Somewhat unlikely	Extremely unlikely
Sorghum based bread products	○	○	○	○	○
Cassava based bread products	○	○	○	○	○
Rice based bread products	○	○	○	○	○
Wheat free bread products	○	○	○	○	○
Wraps	○	○	○	○	○
Roti	○	○	○	○	○
Pan bread	○	○	○	○	○
Organic bread products	○	○	○	○	○

	Extremely likely	Somewhat likely	Neither likely nor unlikely	Somewhat unlikely	Extremely unlikely
Plant based bread products	○	○	○	○	○
Bread products suitable for banting	○	○	○	○	○

Please briefly state why you have not recently purchased any of the above-mentioned bread products:

Addendum C

LETTER FROM ETHICS COMMITTEE FOR RESEARCH

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Natural and Agricultural Sciences
Ethics Committee

E-mail: ethics.nas@up.ac.za

04 June 2020

ETHICS SUBMISSION: LETTER OF APPROVAL

Miss TC Kotzé
Department of Consumer and Food Sciences
Faculty of Natural and Agricultural Science
University of Pretoria

Reference number: NAS108/2020
Project title: South African Consumers Preferences for Sustainable Bread Alternatives

Dear Miss TC Kotzé,

We are pleased to inform you that your submission conforms to the requirements of the Faculty of Natural and Agricultural Sciences Research Ethics committee.

Please note the following about your ethics approval:

- Please use your reference number (NAS108/2020) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, monitor the conduct of your research, or suspend or withdraw ethics approval.
- Please note that ethical approval is granted for the duration of the research (e.g. Honours studies: 1 year, Masters studies: two years, and PhD studies: three years) and should be extended when the approval period lapses.
- The digital archiving of data is a requirement of the University of Pretoria. The data should be accessible in the event of an enquiry or further analysis of the data.

Ethics approval is subject to the following:

- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.
- **Applications using Animals:** NAS ethics recommendation does not imply that AEC approval is granted. The application has been pre-screened and recommended for review by the AEC. Research may not proceed until AEC approval is granted.

Post approval submissions including application for ethics extension and amendments to the approved application should be submitted online via the Ethics work centre.

We wish you the best with your research.

Yours sincerely,

Chairperson: NAS Ethics Committee

Addendum D

MARKET QUICK SCAN OBSERVATION SHEET AND ONLINE COLLECTION

Retail store name: Date:

Data collector's name:

Categories	Product line	Depth of assortment	Price (R)	Mass per unit (g/ml)	Packaging	Trendy characteristics	Promotion / special	Current performance	Other notes

Woolworths								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNITS)	TRENDY CHARACTERISTICS	PRICE (R)
Bread Loaves	Oat and honey flavoured white bread	Woolworths	White bread	Sliced loaf	Wheat	700g	Flavoured topped with oats	19,99
	Multiseed rye bread	Woolworths	Rye with gluten	Sliced loaf	Rye	400g	Wheat free	35,99
	Gluten free spiced cranberry bread	Woolworths	Spiced bread	Loaf	Rice and tapioca flour	320g	Gluten free	59,99
	High fibre whole-wheat brown bread	Woolworths	Whole-wheat heat	Sliced loaf	Wheat	700g	High fibre	18,99
	Cape seed bread	Woolworths	Brown bread	Sliced loaf	Wheat	500g	Blend of seeds & crushed wheat	24,99
	Tante Anna Whole-wheat brown bread	Woolworths	Whole-wheat brown bread	Sliced loaf	Wheat	700g	Source of fibre	19,99
	Thick sliced brown bread	Woolworths	Fortified wheat flour	Sliced loaf	Wheat	700g	Soft fine texture	14,99
	Multiseed bread	Woolworths	Wheat flour and seeds	Sliced loaf round	Wheat	480g	Blend of seeds & crushed wheat	44,99
	Gluten free seeded bread	Woolworths	Linseed flour, potato starch legume flour, millet flour	Sliced loaf	Various (linseed, potato starch, legume flour)	350g	Wheat free and gluten free	49,99
	Gluten free white bread	Woolworths	Rice flour, various (linseed, potato starch, legume flour)	Sliced loaf	Rice flour, various (linseed, potato starch, legume flour)	375g	Gluten free	49,99
	Ancient grain brown bread	Woolworths	Brown bread wheat flour	Sliced loaf	Blend of buckwheat, barley, amaranth, millet & red quinoa	400g	Low in saturated fat, source of fibre	24,99
	100% Rye	Woolworths	100% rye	Slices	Rye flour and sourdough	400g	Wheat free	35,99
	Digest plus brown bread	Woolworths	Wheat flour	Sliced loaf	Wheat flour	700g	Vegan, low fat, source of fibre, probiotics	16,99

Woolworths								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNITS)	TRENDY CHARACTERISTICS	PRICE (R)
	Digest plus whole wheat bread	Woolworths		Sliced loaf	Wheat flour whole wheat, bran	700g	Vegan, low fat, source of fibre, probiotics	16,99
	Seeded wholewheat brown bread	Woolworths	Wheat flour and seeds	Sliced loaf	Wheat flour and seeds	800g	Low is saturated fat, high in fibre	19,99
	Thick sliced brown bread	Woolworths	Fortified wheat flour	Sliced loaf	Wheat flour	700g	Soft and fine texture	14,99
	Thick sliced white bread	Woolworths	Fortified wheat flour	Sliced loaf	Wheat flour	700g	Soft and fine texture	15,99
	Raisin bread	Woolworths	Stone ground wheat flour	Sliced loaf	Wheat flour	500g	Slow fermented, ready to eat, best toasted	32,99
	Seeded oat and quinoa stoneground bread	Woolworths	Stone ground wheat flour	Sliced round loaf	Wheat flour, quinoa and seeds	440g	Vegetarian high in fibre	36,99
	White bread	Woolworths	Wheat flour and seeds	Sliced loaf	Wheat flour	700g	Soft and fine textured	15,99
	Soft rye bread	Woolworths	Rye and wheat flour	Sliced loaf	Rye and wheat flour	400g	Low fat, source of fibre	29,99
	Brioche loaf	Woolworths	Wheat	Sliced loaf	Wheat	400g	Ready to eat, toasted	39,99
	Crushed wheat sourdough bread	Woolworths	Wheat	Sliced loaf	Wheat	400g	Low in saturated fat	39.99
	White sandwich thins	Woolworths	Wheat flour	Sliced and ready	Wheat flour	8 slices	Lunch boxes high fibre, low fat free from cholesterol, easy	10,99
	Brown sandwich thins	Woolworths	Wheat flour	Sliced and ready	Wheat flour	8 slices	Lunch boxes high fibre, low fat free from cholesterol, easy	10,99
Rolls & Buns	Gluten free hamburger rolls	Woolworths	Wheat free	Rolls	Gluten free flour	4 units	Gluten free, free range eggs	34,99
	Burger buns	Woolworths	White wheat bread	Rolls	Wheat flour	4x80g	Firm texture and enriched	22,99
	White cheese rolls	Woolworths	White wheat bread	Rolls	Wheat flour	4 units	Topped with cheese	22,99
	Hotdog buns	Woolworths	Wheat flour and seeds	Rolls	Wheat flour	4x70g	Firm texture and enriched	22,99

Woolworths								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNITS)	TRENDY CHARACTERISTICS	PRICE (R)
	Gluten free seeded bread rolls	Woolworths	White bread with seeds	Rolls	Linseed flour, gluten free flour (flaxseed, vegetable flour), rice flour, potato starch	2 units	Gluten free	29,99
Heat & Eat/ Speciality	Mini garlic butter baguettes	Woolworths	White bread	Heat and eat	Wheat	4 pack	Perfect for a braai	46.99
	Olive ciabatta bread	Woolworths	White bread	Heat and eat	Wheat	400g	Slow fermented	42,99
	Ciabatta bread	Woolworths	Ciabatta	Heat and eat	Wheat	400g	Slow fermentation	37,99
	Garlic butter filled baguette	Woolworths	White bread	Heat and eat	Wheat	280g	Perfect for a braai	44.99
Wraps, Roti, Naan	Indian Kalonji Seed naan bread	Woolworths	Wheat flour and seeds	Naan bread heat and eat	Wheat flour	200g	Oxygen absorber for long shelf life	32,99
	White pita bread	Woolworths	Wheat	Pita heat and eat	Wheat flour	6 units	Traditional Mediterranean	34,99
	Wholewheat pita bread	Woolworths	Wheat	Pita heat and eat	Wheat flour	6 units	Traditional Mediterranean	34,99
	Heat and eat naan bread	Woolworths	Wheat	Naan bread heat and eat	Wheat flour	2 units	Heat and eat	34.99

Dischem								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNITS)	TRENDY CHARACTORISTICS	PRICE (R)
Bread Loaves	Schar Pan Blanco Bread	Schar Pan/ gluten free range	White bread	Sliced bread	Gluten free flour	200g	Pre-packaged and sliced	33,95
	Fresh Earth Brown Bread	Fresh Earth/ gluten free range	Brown bread	Sliced bread	Gluten free flour Tapioca Starch, Sorghum Flour, Rice Flour, Psyllium, Potato Starch	320g	Pre-packaged and sliced	55,95
	Fresh Earth White Bread	Fresh Earth/ gluten free range	White bread	Sliced bread	Gluten free flour Tapioca Starch, Sorghum Flour, Rice Flour, Psyllium, Potato Starch	320g	Pre-packaged and sliced	55,95

Pick n Pay								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNITS)	TRENDY CHARACTORISTICS	PRICE (R)
Bread	Premium brown sliced bread	Sasko	Brown bread	Sliced loaf	Wheat	700g	Source of dietary fibre. Bigger slices. Fortified for better health.	12,99
	Premium white sliced bread	Sasko	White bread	Sliced loaf	Wheat	700g	Source of dietary fibre. Bigger slices. Fortified for better health.	13,99
	White low GI bread	Sasko	White bread	Sliced loaf	Wheat	700g	Low GI all in one white bread, high in fibre, cholesterol free, slow energy release	15,99
	Dumpy honey and oats bread	Sasko	Low Gi white bread	Sliced loaf	Wheat	700g	Vegan, slow release	17,99
	Low Gi whole wheat brown bread	Sasko	Wheat	Sliced loaf	Wheat	800g	Low GI all slow energy release	15,99
	Low GI Dumpy Seeded brown bread	Sasko	Wheat	Sliced loaf	Wheat	800g		17,99
	Low GI Dumpy Whole wheat brown bread	Sasko	Wheat	Sliced loaf	Wheat	800g	Low GI	17,99
	Blue ribbon duo bread	Blue ribbon	White bread	Sliced loaf	Wheat	700g	High fibre	14,99
	Classic brown bread	Blue ribbon	Brown bread	Sliced loaf	Wheat	700g	Classic taste	13,99
	Classic white bread	Blue ribbon	White bread	Sliced loaf	Wheat	700g	Classic taste	14,99
	Wholewheat brown bread	Blue ribbon	Wholewheat	Sliced loaf	Wheat	800g	Wholewheat	14,99
	Gluten free seeded bread	Livewell/Pick n Pay	Gluten free, sunflower seeds, linseed and sesame seeds	Loaf unsliced	Gluten free	400g	High in fibre	49,99
	Superior sliced brown bread	Albany	Brown bread	Sliced loaf	Wheat	700g	Fresher for longer	13,99
	Superior sliced white bread	Albany	White bread	Sliced loaf	Wheat	700g	Fresher for longer	14,99

Pick n Pay								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNITS)	TRENDY CHARACTORISTICS	PRICE (R)
	Ultima brown bread multigrain	Albany	Multigrain	Sliced loaf	Wheat	700g	High in fibre	17,99
	Ultima Rooibos & rye brown bread	Albany	Brown and rye bread	Sliced loaf	Rye and wheat	700g	Flavoured	17,99
	Ultima brown KJ controlled bread	Albany	Brown wheat	Sliced loaf	Wheat	500g	KJ controlled	15,99
	Superior thick sliced brown bread	Albany	Wheat	Sliced loaf	Wheat	700g	Thick sliced	13,99
	Superior best of both white bread	Albany	Wheat	Sliced loaf	Wheat	700g	Appearance of white and taste of white but nutritious as brown	15,99
	Superior low GI sliced brown seeded bread	Albany	Wheat	Sliced loaf	Wheat	700g	Low GI	14,99
	High protein brown bread	Futurelife	White bread	Sliced loaf	Wheat	700g	High in protein	17,99
	High protein ancient grain brown bread	Futurelife	Wheat	Sliced loaf	Wheat and ancient grains	800g	Low GI, High Fibre, nutrient-dense goodness from a carefully selected blend of 3 ancient grains, 2 seeds and rolled oats all in a delicious, High Protein, NON-GMO and vegan-friendly brown bread.	19,99
Speciality	Ciabatta	Pick n Pay	Ciabatta	Loaf	Wheat	400g	Selected starter culture and slow fermenting	24,99
	Garlic and parsley bread	Pick n Pay	White bread	Heat and eat loaf	Wheat	240g	Crisp crust soft interior garlic and parsley butter	26,99
Wraps	White pita bread	Pick n Pay	Pita bread	Pita	Wheat	4 units	Hollow interior for filling	32,99
	Brown pita bread	Pick n Pay	Pita bread	Pita	Wheat	4 units	Hollow interior for filling	32.99

Checkers								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNIT)	TRENDY CHARACTORISTICS	PRICE (R)
Bread	Crushed wheat bread	Sunbake	White bread	Sliced loaf	Wheat	700g	Source of vitamin D & calcium	13,99
	Everyday brown bread	Sunbake	Brown bread	Sliced loaf	Wheat	700g	Source of vitamin d and calcium	11,49
	Everyday white bread	Sunbake	White bread	Sliced loaf	Wheat	700g	Source of vitamin d and calcium, high energy	12,99
	Everyday white farmstyle bread	Sunbake	White bread	Sliced loaf	Wheat	700g	Source of vitamin D and calcium	12.99
	Everyday brown farmstyle bread	Sunbake	Brown bread	Sliced loaf	Wheat	700g	Source of vitamin D and calcium	11,49
	Vita-Life Low GI brown bread	Sunbake	Brown bread	Sliced loaf	Wheat	700g	Low gi	13,99
	Vita-Life Low GI white bread	Sunbake	White bread	Sliced loaf	Wheat	700g	Low gi	15,49
	Superior sliced brown bread	Albany	Brown bread	Sliced loaf	Wheat	700g	Fresher for longer	13,99
	Superior sliced white bread	Albany	White bread	Sliced loaf	Wheat	700g	Fresher for longer	14,99
	Ultima Rooibos & rye brown bread	Albany	Brown and rye bread	Sliced loaf	Rye and wheat	700g	Flavoured	19,99
	Ultima brown KJ controlled bread	Albany	Brown wheat	Sliced loaf	Wheat	500g	KJ controlled	16,99
	Best of both white bread	Albany	White bread	Sliced loaf	Wheat	700g	Texture and taste of white bread some	15,99

Checkers								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNIT)	TRENDY CHARACTORISTICS	PRICE (R)
							characteristics of brown bread	
	Superior low GI sliced brown seeded bread	Albany	Wheat	Sliced loaf	Wheat	700g	Low GI	17,99
	Superior 100% smooth wholegrain brown bread	Albany	Brown and wholegrain bread	Sliced loaf	Wheat	700g	Smooth and source of fibre, goodness of wholegrain but smoothness of white bread, heart and stroke foundation	16,99
	Best of both genious speciality bread	Albany	White bread	Sliced loaf	Wheat	700g		16,99
	Superior low GI sliced brown seeded bread	Albany	Wheat	Sliced loaf	Wheat	700g	Low GI	16,99
	Superior low GI Wholewheat brown bread	Albany	Wheat	Sliced loaf	Wheat	800g	Low Gi	16,99
	Superior thick sliced brown bread	Albany	Wheat	Sliced loaf	Wheat	700g	Thick sliced	13,99
	Smart sliced brown bread	Futurelife	Brown bread	Sliced loaf	Wheat	700g	Omega 3 high in fibre	15,99
	High protein ancient grain brown bread	Futurelife	Wheat	Sliced loaf	Wheat and ancient grains	800g	Low GI, High Fibre, nutrient-dense goodness from a carefully selected	19,99

Checkers								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNIT)	TRENDY CHARACTORISTICS	PRICE (R)
							blend of 3 ancient grains, 2 seeds and rolled oats all in a delicious, High Protein, NON-GMO and vegan-friendly brown bread.	
	Oats and honey flavoured brown bread	Futurelife	Brown bread	Sliced loaf	Wheat	700g	High protein	19,99
	Primium brown sliced bread	Sasko	Brown bread	Sliced loaf	Wheat	700g	Source of dietary fibre. Bigger slices. Fortified for better health.	12,99
	Primium white sliced bread	Sasko	White bread	Sliced loaf	Wheat	700g	Source of dietary fibre. Bigger slices. Fortified for better health.	13,49
	Low GI wholewheat brown bread	Sasko	Wholewheat	Sliced loaf	Wheat	800g	Low GI	14.99
	Low GI Dumpy Cranberry Brown Bread	Sasko	Brown bread	Sliced loaf	Wheat	800g	Low GI and flavoured	16,99
	Low GI all in one	Sasko	White bread	Sliced loaf	Wheat	700g		14,99
	Low GI Dumpy Soy and Linseed White Bread	Sasko	White bread	Sliced loaf	Wheat	800g	Flavoured low gi	16,99

Checkers								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNIT)	TRENDY CHARACTORISTICS	PRICE (R)
	Dumpy honey and oats bread	Sasko	Low Gi white bread	Sliced loaf	Wheat	700g	Vegan, slow release	16,99
	Low GI Dumpy seeded wholewheat brown bread	Sasko	Low gi brown bread	Sliced loaf	Wheat	800g	Seeded	16,99
	Classic white bread	Blue ribbon	White bread	Sliced loaf	Wheat	700g	Classic taste	13,99
	Classic brown bread	Blue ribbon	Brown bread	Sliced loaf	Wheat	700g	Classic taste	12,99
	Wholewheat brown bread	Blue ribbon	Wholewheat	Sliced loaf	Wheat	800g	Wholewheat	15,99
	Blue ribbon duo bread	Blue ribbon	White bread	Sliced loaf	Wheat	700g	High fibre	15,99
	Sorghum mini loaf	Calorie Conscious	Sorghum bread	Sliced mini oaf	Sorghum flour	230g	Calorie conscious and gluten free	19,99
	Gluten free buckwheat bread	Calorie Conscious	Maize buckwheat, rice tapioca flour, potato flour, sorghum flour, millet flour	Sliced loaf	Maize buckwheat, rice tapioca flour, potato flour, sorghum flour, millet flour	250g	Calorie conscious and gluten free	36,99
Rolls & Buns	White rolls	Sasko	White bread	Rolls	Wheat	4 units	Easy to wrap and eat	13,99
	Best of both white rolls	Albany	White bread	Rolls	Wheat	6 units		18,99
	Best of both white buns	Albany	White bread	Buns	Wheat	6 units		18,99
	Superior white buns	Albany	White bread	Buns	Wheat	6 units		16,99

Checkers								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNIT)	TRENDY CHARACTORISTICS	PRICE (R)
	Superior brown rolls	Albany	Brown bread	Rolls	Wheat	6 units		17,99
	Superior brown buns	Albany	Brown bread	Buns	Wheat	6 units		17,99
	Roostie (Bacon & feta, Bacon & cheese, Biltong & feta)	Nizza Foods	White bread	Rolls	Wheat	4 units	Filled to put onto braai	32,99
	Everyday white hotdog rolls	Sunbake	White bread	Rolls	Wheat	6 units		13,99
	Everyday hamburger buns	Sunbake	White bread	Buns	Whaet	6 units		13,99
	Treats cheese buns	Sunbake	White bread with cheese	Buns	Wheat	4 units		19,99
	Regular white rolls	Sasko	White bread	Rolls	Wheat	6 units		13,99
	Regular white buns	Sasko	White bread	Buns	Wheat	6 units		13,99
	Low GI all in one white buns	Sasko	White bread	Buns	Wheat	6 units		16,99
	Low GI all in one white rolls	Sasko	White bread	Rolls	Wheat	6 units		16,99
	Wholewheat sandwhich squares	Blue ribbon	Wholewheat	Sandwhich squares	Wheat	220g	Easy sandwhiches	10,99

Checkers								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNIT)	TRENDY CHARACTORISTICS	PRICE (R)
	Multiseed and oats sandwhich squares	Blue ribbon	White bread	Sandwhich squares	Wheat	220g	Easy sandwhiches	10,99
	Brown sandwhich squares	Blue ribbon	Brown bread	Sandwhich squares	Wheat	220g	Easy sandwhiches	10,99
	White sandwhich squares	Blue ribbon	White bread	Sandwhich squares	Wheat	220g	Easy sandwhiches	9,99
	Seeded rolls	Banting revolution	Gluten free macadamia nut flour and linseed flour	Buns	Wheat	175g	Banting friendly	29,99
	White hamburger rolls	Wheatfields	White bread	Buns	Wheat	6 units		9,99
	White hotdog rolls	Wheatfields	White bread	Rolls	Wheat	6 units		9,99
Speciality	Bakery Ciabatta bread	Checkers	White bread	Loaf unsliced	Wheat	400g	Crisp exterior soft interior	19,99
Wraps, Roti, Naan	Flour tortillas	Blue shirt bakery	White	Tortillas	Wheat	6 units	Heat, fill and eat	28,99
	Large wraps	Blue shirt bakery	White	Wraps	Wheat	8 units	Heat, fill and eat	44,99
	Brown tortillas	Blue shirt bakery	Brown	Tortillas	Wheat	6 units	Heat, fill and eat	28,99
	Traditional soft flour tortillas	Mexicorn	White	Tortillas	Wheat and corn	8 units		36,99
	Traditional wraps	Mexicorn	White	Wraps	Wheat and corn	6 units		39,99
	Large wraps	Blue shirt bakery	Brown	Wraps	Wheat	4 units		24,99

Kwikspar								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNIT)	TRENDY CHARACTORISTICS	PRICE (R)
Bread	Superior white sliced bread loaf	Albany	White bread	Sliced loaf	Wheat	700g	Fortified with v and minerals	14,99
	Superior brown sliced bread loaf	Albany	Brown bread	Sliced loaf	Wheat	700g	Fibre filled	13,99
	Superior best of both white bread	Albany	White bread	Sliced loaf	Wheat	700g	Taste of white nutrition of brown bread	15,99
	Superior 100% smooth wholegrain brown sliced bread	Albany	Brown bread	Sliced loaf	Wheat	700g	Nutrition of wholegrain and taste of white	14,99
	Superior toaster thick slice white bread	Albany	White bread	Sliced loaf	Wheat	700g	Thicker	15,49
	Superior toaster thick slice brown bread	Albany	Brown bread	Sliced loaf	Wheat	700g	Thicker	15,49
	Low GI wholewheat brown bread	Albany	Brown bread	Sliced loaf	Wheat	800g	Low GI	15,99
	Low GI wholewheat white bread	Albany	White bread	Sliced loaf	Wheat	800g	Low GI	15,99
	Low GI Seeded brown loaf	Albany	Brown bread	Sliced loaf	Wheat	700g	Low GI	15,49

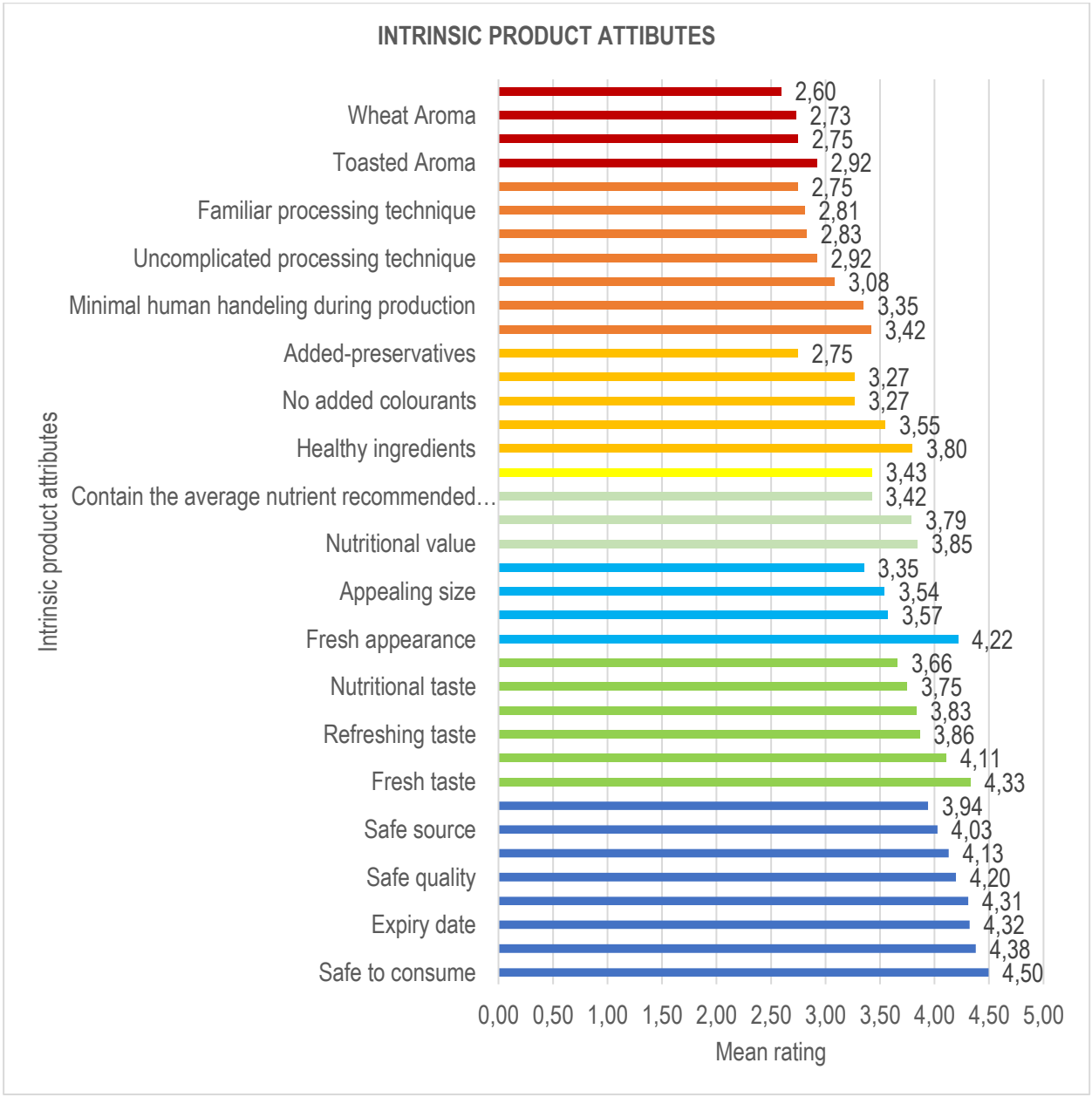
Kwikspar								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNIT)	TRENDY CHARACTORISTICS	PRICE (R)
	Ultima Rooibos & Rye brown bread	Albany	Brown bread	Sliced loaf	Wheat	700g	Local flavours and high in Vitamin e and antioxidants	14,99
	Ultima brown bread	Albany	Brown bread	Sliced loaf	Wheat	700g	Smart carb, low GI, high fibre	16,99
	Low gi whole wheat brown sliced bread	Sasko	Brown bread	Sliced loaf	Wheat	800g	Cholesterol free, high in fibre and low GI	15,99
	Low GI all in one white sliced loaf	Sasko	White bread	Sliced loaf	Wheat	700g	Cholesterol free, high in fibre and low GI	15,99
	Low GI Dumpy Oats and honey flavoured white sliced bread	Sasko	White bread	Sliced loaf	Wheat	900g	Vegetarian, suitable for diabetics, low GI	17,99
	Low GI Dumpy Soy and Linseed white sliced bread	Sasko	White bread	Sliced loaf	Wheat	800g	Omega 3, high in fibre, low GI	17,49
	Low GI dumpy Cranberry brown bread	Sasko	Brown bread	Sliced loaf	Wheat	800g	Vitamin c, high in iron, high in Vitamin E and low GI	17,49
	Low GI dumpy wholewheat brown sliced bread loaf	Sasko	Brown bread	Sliced loaf	Wheat	800g	Cholesterol free, high in fibre, low GI	17,49
	Low GI dumpy seeded wholewheat	Sasko	Wholewheat	Sliced loaf	Wheat	800g	Cholesterol free, high in fibre, low GI	17,49

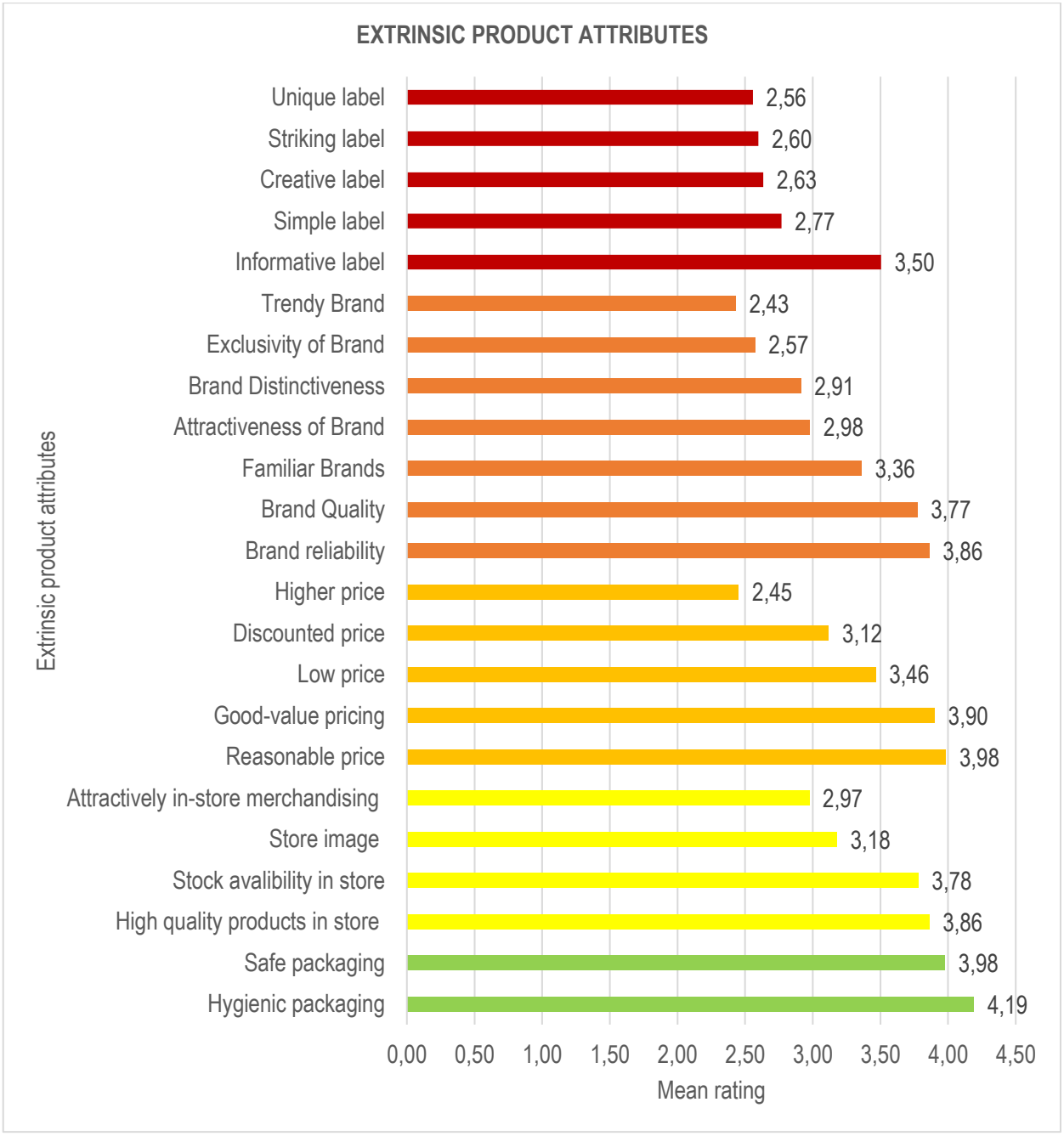
Kwikspar								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNIT)	TRENDY CHARACTORISTICS	PRICE (R)
	sliced bread loaf							
	Premium sliced white bread	Sasko	White bread	Sliced loaf	Wheat	700g	Fortified with essential vitamins and minerals	14,99
	Duo high fibre white sliced bread loaf	Blue ribbon	White bread	Sliced loaf	Wheat	700g	High fibre	13,59
	Classic white sliced bread	Blue ribbon	White bread	Sliced loaf	Wheat	700g	Fortified with essential vitamins and minerals, high fibre	
	Classic brown sliced bread	Blue ribbon	Brown bread	Sliced loaf	Wheat	700g	Fortified with essential vitamins and minerals, high fibre	
	High protein brown sliced bread loaf	Futurelife	Brown bread	Sliced loaf	Wheat	700g	Non-GMO, high protein, vegan, low GI, high fibre	15.99
	High protein ancient grain bread	Futurelife	Brown bread	Sliced loaf	Wheat	800g	Non-GMO, high protein, vegan, low GI, high fibre	19,99
	Rye bread	Dutch Bakery	Rye bread	Sliced loaf	Rye	496g		34,99
	Wholewheat sandwhich squares	Blue ribbon	Wholewheat	Sandwhich squares	Wheat	220g	Easy sandwhiches	10,99
	Brown sandwhich squares	Blue ribbon	Brown bread	Sandwhich squares	Wheat	220g	Easy sandwhiches	9,99

Kwikspar								
	PRODUCT	BRAND/ PRODUCT LINE	DEPTH OF ASSORTMENT	FORM	GRAIN	AMOUNT (G/ UNIT)	TRENDY CHARACTORISTICS	PRICE (R)
	White sandwhich squares	Blue ribbon	White bread	Sandwich squares	Wheat	220g	Easy sandwhiches	9,99
Wraps, Roti,	Roti	Spar Freshline	Wheat	Roti	Wheat	6 units		30,99
	Mini pita	Anat	Wheat	Pita	Wheat	10 units		29,99
	Brown pita	Anat	Wheat	Pita	Wheat	4 units		26,99
	White pita	Anat	Wheat	Pita	Wheat	6 units		31,99

Addendum E

PRIORITISATION OF INTRINSIC & EXTRINSIC PRODUCT ATTRIBUTES





Attribute	Dimension	N	Mean	Standard deviation	Variance
Food safety M=4,21	Safe to consume	461	4,50	0,88	0,774
	Fresh quality	461	4,38	0,849	0,722
	Expiry date	469	4,32	0,951	0,905
	Best before date	463	4,31	0,941	0,885
	Safe quality	467	4,20	0,954	0,91
	Sell buy date	468	4,13	1,052	1,106
	Safe source	456	4,03	1,031	1,064
	Storage condition	463	3,94	1,021	1,043
Taste M=3,84	Fresh taste	461	4,33	0,87	0,757
	Appealing taste	462	4,11	0,928	0,861
	Refreshing taste	468	3,86	1,044	1,091
	Flavoursome taste	457	3,83	1,099	1,209
	Nutritional taste	463	3,75	1,079	1,164
	Natural taste	465	3,66	1,017	1,035
Visual appearance M=3,67	Fresh appearance	467	4,22	0,916	0,838
	Positive visual appearance	463	3,57	1,12	1,255
	Appealing size	461	3,54	1,146	1,314
	Appealing colour	455	3,35	1,187	1,41
Nutritional value M=3,69	Nutritional value	466	3,85	1,075	1,156
	High nutritional value	466	3,79	1,099	1,207
	Contain the average nutrient recommended dietary allowance	463	3,42	1,207	1,456
Texture M=3,43	Texture	468	3,43	1,217	1,481
Ingredients M=3,33	Healthy ingredients	469	3,80	1,055	1,114
	Natural ingredients	465	3,55	1,144	1,309
	No added colourants	469	3,27	1,278	1,634
	No added preservatives	462	3,27	1,234	1,522
	Added-preservatives	464	2,75	1,203	1,447
Processing technique/ production M=3,03	Locally produced	461	3,42	1,23	1,514
	Minimal human handling during production	462	3,35	1,26	1,587
	Natural processing technique	465	3,08	1,243	1,546
	Uncomplicated processing technique	459	2,92	1,283	1,645
	Organic processing technique	462	2,83	1,246	1,552
	Familiar processing technique	459	2,81	1,183	1,4
	Innovative processing technique	468	2,75	1,229	1,509
Aroma M=2,76	Toasted Aroma	456	2,92	1,117	1,249
	Sweet Aroma	466	2,75	1,222	1,493
	Wheat Aroma	459	2,73	1,222	1,494
	Yeast Aroma	465	2,60	1,138	1,295
Packaging M=4,08	Hygienic packaging	462	4,191	1,006	1,013
	Safe packaging	462	3,977	1,07	1,145
Store image M=3,46	High quality products in store	464	3,86	1,047	1,096
	Stock availability in store	464	3,78	1,119	1,252
	Store image	464	3,18	1,189	1,413
	Attractively in-store merchandising	458	2,97	1,244	1,549
Price M=3,40	Reasonable price	464	3,98	1,065	1,134
	Good-value pricing	464	3,90	1,181	1,394
	Low price	468	3,46	1,025	1,051
	Discounted price	459	3,12	1,272	1,617
	Higher price	457	2,45	1,183	1,399
Brand M=3,14	Brand reliability	465	3,86	1,043	1,089

Attribute	Dimension	N	Mean	Standard deviation	Variance
	Brand Quality	461	3,77	1,084	1,175
	Familiar Brands	464	3,36	1,204	1,449
	Attractiveness of Brand	464	2,98	1,23	1,512
	Brand Distinctiveness	467	2,91	1,211	1,467
	Exclusivity of Brand	459	2,57	1,286	1,654
	Trendy Brand	463	2,43	1,202	1,444
Label M=2,82	Informative label	461	3,50	1,24	1,537
	Simple label	467	2,77	1,147	1,316
	Creative label	456	2,63	1,19	1,417
	Striking label	459	2,60	1,2	1,439
	Unique label	466	2,56	1,263	1,595

Addendum F

CONFERENCE CONTRIBUTIONS

SAAFoST South African Association for Food Science & Technology 26th May 2019 9:00-15:00 @ Future Africa

Theme: Wholegrain, multigrain & wheat-free bakery products *Opportunities for locally available cereals and pulses, and ingredient solution suppliers*

Presented: Unwrapping consumers' preferences for bread products