

CONSUMERS' PREFERENCE AND WILLINGNESS TO PAY FOR GRADED BEEF IN
POLOKWANE MUNICIPALITY OF LIMPOPO PROVINCE, SOUTH AFRICA.

By

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A MINI-DISSERTATION submitted in partial fulfilment of the requirements for the
degree

Of

Master of Science in Agriculture

In

Agricultural Economics

In the

Faculty of Science and Agriculture

(School of Agriculture and Environmental Sciences)

At the

UNIVERSITY OF LIMPOPO, SOUTH AFRICA.

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2018

DECLARATION

I, Lesiba Florah Makweya, declare that this thesis is a result of my own work, and that to the best of my knowledge, the findings have never been previously presented to the University of Limpopo or elsewhere for the award of any academic qualification. All the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

.....

Signature

.....

Date

DEDICATION

This thesis is dedicated to the memory of my father, Khomotjo Joseph Makweya, who always believed in my ability to be successful in the academic arena. You are gone but your belief in me has made this journey possible.

ACKNOWLEDGMENTS

Firstly, I wish to thank the Almighty God for the opportunity and blessings of education. God has been so good to me and has brought me from far and has provided all that I have needed to walk this journey. I consider the successful completion of this work as a gift from God and I am truly grateful.

I would like to thank my supervisor, Prof Isaac Oluwatayo, for the patient guidance, encouragement and advice he has provided throughout my time as his student. I have been extremely fortunate to have had such a wonderful supervisor who cared so much about my work, and who responded to my questions and queries so promptly. I appreciate Mr LJ Ledwaba for his guidance and suggestions that have greatly contributed to the success of this research.

I would like to acknowledge the National Research Fund Freestanding Scholarship (NRF) for providing the funding for this research and my master's studies at the University of Limpopo. This thesis would not have been completed without their financial support. Thanks to Mrs Mangena, Mr Sitholimela and Mr Sekotlong from the Department of Agriculture for their support and technical assistance at times.

My utmost regard goes to my mother, pillar of strength, Fancy Makweya who painstakingly laid the foundation of my education giving it all it takes. I would also like to acknowledge the love, patience, support and continued encouragement of my siblings, sesi Mphela, sesi Moloko, Tokelo and Mcdonald, as well as my nieces and nephews – Bonolo, Kgethang, Kgarudi, Mokgethwa and Kamogelo. I can never ask God for a better family, you guys complete me.

I recognize, with appreciation, my boyfriend 😊, best friend, all my friends, well-wishers and everyone, whose contribution to this work in prayers, encouragement, and moral support helped me hold on throughout my study. I love you guys.

Finally, thanks to all enumerators involved in data collection for their committed efforts and to all consumers who took part in the survey for their important information to this research.

ABSTRACT

The demand for animal products is projected to increase progressively due to extensive urbanization, rapid growth of human population and income dynamics. However, the evolution of food demand is strictly linked to the change in consumer preferences. Consumers around the world are progressively becoming more concerned and aware about food standards, quality and safety issues. The purpose of this study was to determine consumers' preference regarding safe and quality beef and WTP for graded beef in Polokwane municipality. The research surveyed 150 consumers using a structured questionnaire to collect data on consumer characteristics and responses to different bid levels for graded beef. Analytical methods were descriptive statistics, Likert scales, contingent valuation method to evaluate respondents' mean WTP for graded beef and logit model to determine the dependence of WTP on socioeconomic factors. Results showed that consumers prefer their beef tender, with less fat and bones and labelled with price, grade/class, size or quantity of the product and lastly quality inspection or certification indicator. Over half of the respondents (53%) were aware of grading or classification systems. The results further revealed that most respondents are willing to pay an increase of 16.04 % over the current price for beef. This could be an opportunity for investments in beef label industry. Consumer characteristics including age, income, gender and household size significantly influenced WTP for graded beef in Polokwane Municipality. Marketing strategies considered by beef product investors should target young, female and wealthier consumers. Grading with respect to quality attributes would make beef sales at differentiated prices possible. This will eventually enhance sales volume and returns for all stakeholders along the value chain.

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CHAPTER ONE

INTRODUCTION

1.1. Background

The global market for animal food products and the demand for meat-based sources of protein have increased significantly throughout the world (Thompson *et al.*,2010). Meat has become the fastest growing agricultural product worldwide due to high consumption rates and large quantities of trade (Schutte 2006). Beef represents an important livestock commodity in the international market for animal-based food products. Growth in the international market for beef products has endorsed significant expansion of cattle operations throughout the world (Hall 2012).

According to Thompson *et al.* (2010), achieving improvements in profitability and long-term viability of the emerging beef sector in South Africa has been identified as a national priority. Returns to the producer are directly linked to beef demand determined by the relationship of price and quality. An understanding of consumers' preference for beef quality, and of the connection of quality to price, is an important foundation for developing programs that can build demand and improve returns.

In spite of the nutritional value beef constitutes to the diets of most consumers, its consumption has turned out to be a very questionable issue. From one viewpoint, beef represents a valuable source of proteins, vitamins (A, B6, B12, D and E), biologically utilizable contents of minerals (Calcium, Phosphorous, Iron, and Magnesium) and micronutrients that are contributing to consumers' health throughout life (Markiewicz 2010 and Mabhera 2015). Hence, the dietary worth has been vital to convey the medical advantages of red meat to buyers. Then again, red meat has been highly topical in the past two decades because of the arising innovations in the meat industry the developments in the market have tarnished the positive image of the value of meat. (Van Wezemaal *et al.* 2010).

Consumers' all over the world have become increasingly concerned about food-borne diseases, personal health and aware of the quality of food they consume. Therefore, consumer demand for safe and healthful foods has been increasing. The fat content and the possibly negative effect of red meat on consumers' cholesterol levels have become one of their major health concerns (Van Wezemaal *et al.*, 2010).

All over the world buyers have turned out to be progressively worried about food borne diseases, personal health and are aware of the quality of food they consume. (Van Wezemael *et al.* 2010). On another perspective, Kumm (2002) iterated that consumers are increasingly expressing concerns on the how the production, processing and transportation of meat is done, particularly since producing beef is resource intensive and aggressive on the environment. This has led consumers to seek for beef which is of high-value, safer, healthier and produced in an ecological and ethical harmony with the environment. Radman *et al.* (2005) explains that these structural modifications in consumer trends result from economic and social factors such as modern lifestyles, increased education, rising incomes and globalization.

As South Africa makes its transition to a developed economy, a percentage of its population is becoming wealthier, demanding more goods, being more health cautious and eating foods of higher quality standards (Vermeulen and Biénabe, 2010). This trend has emerged in developed countries and is now increasingly common in growing urban areas of developing and transitional countries (Dhivya, 2014). Populations residing in the urban areas of this developing country are increasingly becoming more aware of food safety issues and this requires manufacturers and sellers to be more concerned with production techniques, packaging, personal hygiene and other food safety requirements in order to understand what influences consumers' purchasing decisions and to meet their expectations (Uwamaliya, 2014).

Appearance of the product, convenience, shopping environment and product quality among others, are external factors that shape consumers' preference and choice in a market place. In an ideal world, consumers choose the package of food products that offers them the highest level of satisfaction, on the chance that they can absolutely decide the quality characteristics of those food items (Owusu-Sekyere 2014). However, in cases where important information about product quality and safety is absent, consumers go through considerable challenges when choosing a product because they do not know risks associated with the product (Schroeter 2005).

The perception consumers have of the effectiveness of regulation on product quality and safety in a country is generally important for the development of internal and especially export markets. Such perception and trust become crucial when consumers cannot really evaluate some or all of a product's attributes, especially process

attributes: it may be prohibitive to find out whether a product is actually “environmentally friendly”, “organic”, or simply completely safe. Therefore, consumers’ notion of quality and demand will be related to their trust in regulation (Cuffaro and Di Giacinto, 2014).

According to Berges *et al.* (2015), a price paid by consumers for the attribute food safety may be an important incentive to develop and/or adopt private standards provided that these efforts are explicitly or implicitly communicated to consumers. Food safety standards in developed countries are serving to shape the expectations of developing countries consumers, especially those with higher incomes and in urban areas (Jaffee, 2004). Therefore, it is important for developing countries to comply with international standards as it can help them to upgrade their capacity in regulation and monitoring of food value chains, as well as to participate in international markets.

In this context, labels of food products play an important role as it provides all the mandatory information regarding nutritional composition, safety and quality of food. Basically, labels provide information on ingredients of the food products, nutritional properties, preparation, storage, etc. Consumers purchasing decisions mainly depend on the perception of the product. Food labelling has been found to be one of the most important factors affecting for the purchasing decisions of the consumers (Bazhan *et al.*, 2015). When designing the labels for food products, manufacturers should follow the legislations imposed by the government of a particular country. Labels should provide detailed and exact nature and characteristics of the food product without misleading the consumers (Bandara *et al.*, 2016).

1.2. Problem statement

A primary issue in the scandalous nature of meat is the manifestation of food safety cases. The meat sector, particularly the beef industry, is prone to many food scares including, the recent case of *Listeria* in processed meat products, the bovine spongiform encephalopathy catastrophe, *Salmonella*, *E. coli*, dioxin (harmful residues) and genetic modifications (hormones) in the final products. These occurrences have caused financial losses, social interruptions and have damaged the reputation of the meat sector (Van Wezemael *et al.*, 2010).

Beef is an interesting case to analyse in South Africa regarding food safety as the beef industry contributes to food security and the growth of the economy. The beef industry

in SA is not yet developed, compared with other industries it is challenged by growing demand surge, globalization, meeting consumers' changing expectations and increased complexities on the production of quality beef (Labuschagne *et al.*, 2011). The South African carcass classification system assumes an imperative part in categorizing red meat carcasses to encourage price creation however, does not include any measure of meat quality. The system provides inadequate description of the meat quality characteristics and does not play a role at the consumer level, it clearly shows that it is strongly inclined towards meat sellers (Vermeulen *et al.* 2015).

The government has not yet set the required compulsory quality standards for beef in SA, the product sold on the market has no inspection indicators or labels to highlight information about product origin and quality characteristics. The country has experienced multiple health problems because of foodborne outbreaks, this has positioned most consumers in an uncertain state regarding beef safety and quality (Labuschagne *et al.*, 2010).

Unlike its trading partners and neighbouring countries (Namibia, Swaziland, Botswana), South Africa does not have an official livestock traceability system for animal disease and food safety management that can be used in conjunction with the Animal Identification System and movement control of animals. The demand of traceability of animals and animal products is increasingly being placed on producers, processors and distributors by both local and international consumers and sanitary regulators (DAFF, 2015).

The confidence consumers have in the safety and suitability of food derivatives, in part, comes from the perception of the effectiveness of food control measures, including traceability, inspection and certification (Uwamaliya, 2014). The information on labels is a significant tangible tool used by consumers to measure product quality or provide consumers with valuable quality indicators. However, South African consumers' views and usage on meat labels are largely unknown. According to Vermeulen *et al* (2015) there is a definite need for the development and consumer testing of an appropriate front-of-pack labelling system to communicate quality and grading system on product labels. However, these measures on product labels entails additional costs, which can increase the price of certified products (Uwamaliya, 2014). Producers are reluctant to provide higher quality food attributes that require higher

production cost if there is no way to capture the added value associated with increased product quality (Gao, 2007).

It is generally believed that consumers infer the quality of the meat through various signals such as aroma, colour, fat, type of meat cut and packaging (Latvala, 2010, Troy and Kerry, 2010). However, most attributes relating to food quality are credence or experience attributes, consumers cannot use their purchasing power to reveal their true demand for those attributes without additional food quality information. Public understanding and opinion are extremely important factors in marketing of fresh products (Unnevehr and Roberts, 2002). Such attitudes interact with other factors in determining consumers' purchase decisions.

The specific factors that influence South African consumers' preference regarding safe and quality beef and WTP for graded beef are not known because of absence of empirical literature. Labelling and traceability have been announced as a potential powerful vehicle for consumer reassurance. However, in practice, large gaps exist between reality and consumer perception of labels. This study intends to fill in the gaps by providing substantial and distinctive features required on labelled meat by consumers.

1.3. Aim and objectives

The main aim of the study is to examine consumers' preference and WTP for graded beef in Polokwane municipality.

1.3.1. Objectives

The specific objectives of the study are to:

1. Identify and describe the socioeconomic characteristics of the consumers
2. Assess consumers' awareness on grading of beef.
3. Assess consumers' preference in relation to beef quality.
4. Determine consumers' WTP for graded beef in Polokwane municipality.
5. Assess the relationship between consumers WTP and their socio-economic characteristics

1.3.2. Hypotheses

- i. Consumers are not willing to pay for graded beef.
- ii. Socio-economic characteristics do not influence consumers' WTP for graded beef.

1.4. Justification

The grade of a beef cut sold at retail can be an important selection factor for many consumers. Likewise, the grade of a beef carcass is critical to the beef producer (Soji *et al.*, 2015). Therefore, an understanding of the nature of beef grades and the quality and safety attributes that consumers prefer and are willing to pay for is essential for market actors and producers to respond to those preferences. According to Jabbar *et al.* (2010), understanding safety and quality attributes of beef and their price premium may provide a basis for initiating specification and harmonization of localized grades and standards.

An understanding of the factors that determine consumers' perception of a product's value or cost is of crucial importance to an industry's product innovation, choice of marketing and communication strategy and maintenance of competitive advantage (Liana *et al.*, 2010). Research on consumers' WTP for graded beef is important in order to fill the gap in meat safety and quality knowledge on the demand side, by assessing the consumers' preferences for meat quality in general. The study also helps in encouraging livestock farmers to produce beef of high quality and this will increase the price of beef and consequently increasing their incomes.

On the side of consumers, the study contributes to ensuring food safety conditions and prevents risks that would arise from the consumption of poor quality beef. With regard to national policy, the findings from this study helps in accomplishment of Sustainable Development Goal (SDG) one of eradication of extreme poverty and hunger which emphasizes on nutrition aspects (United Nations UN, 2013). Furthermore, policy makers will acquire information in terms of setting standards for beef in South Africa and improve on food safety conditions.

1.5. Organisation of the study

This paper is organized as follows. Chapter 1 is the introduction of the dissertation. The background and problem statement, that form the basis for conducting this study, are discussed. Chapter 2 consists of a literature study on the beef industry in South Africa and consumers' preferences on the quality of beef. It focuses on the impact of factors affecting the purchase of beef and consumption thereof, factors affecting food decisions made by individual consumers. Furthermore, it discusses the importance of grading beef in SA. Chapter 3 deals with methodology part: whereby data sources,

method of data collection, sampling techniques, methods of data analysis and the procedures employed in analysing the specific objectives of the study are discussed. Chapter 4, the results from the survey questionnaires are discussed in detail and reference to the literature study is made. The last chapter concludes the study based on the findings. From these findings, policy implications and recommendations pertaining to livestock farming, the meat industry, government, as well as for future scientific and empirical research were set.

CHAPTER TWO

LITERATURE REVIEW

2.1. South African beef industry

2.1.1. Beef production

The long-term contribution of the red meat sector and beef to the total gross value of agricultural production in South Africa from 1996/97 to 2008/2009 stood at 13.2% and 9.4%, respectively (Soji *et al.*, 2015). Local demand for beef still outstrips local supply. The beef supplied by the two farming sectors meets only 85% of the beef requirements in South Africa leaving a deficit of about 15% which is catered for through imports, making South Africa a net importer of beef (DAFF, 2011). More than 70% of all animal slaughtered in the formal sector in South Africa originates from commercial feedlots, where 67% of the feedlot animals are either crossbreeds or British and European imported breeds (53%) (Scholtz *et al.*, 2008). The trends of beef production have been reported to be like those of mutton and lamb.

2.1.2. Growth prospects of the beef industry

Against the scenery of various risk factors, for example, drought, land reform, animal diseases, the price advantage of poultry over beef, uncertain trade policy, the influence of non-economic factors such as product consistency, quality, food safety, health and nutrition concerns, and convenience (ARC, 2016), the South African (SA) beef industry remains one of the strategic sectors in the South African economy. In 2014 the annual contribution of the beef industry to the agricultural GDP was R22 billion and in 2013, the industry employed about 500 000 people (DAFF & NAMC, 2015).

Although cars, property and adornments speak to clear indications of wealth, there is another, less evident marker of the country's developing wealth: the food consumers are putting on their plates. The development of consumers towards higher income groups, has been a key element of the South African consumer landscape for a long time (ARC, 2016). From 2004 to 2014 the share of South African adults that classified as poor declined by more than 80 percent, accompanied by an increase in the share of adult population classified within the middle-class consumer groups (DAFF, 2015).

With the growth in disposable income, South African's affection for meat is reflected by its purchasing behaviour. The per *capita* consumption of beef increased consistently from 2001/2002 until 2005/2006, from 12.34 kg per year to 17.44 kg per

year (ARC, 2016). The increase in consumption of beef products can be credited to, among others, population growth, economic growth, the rising income of the middle-income group, the so called “black diamonds” and a change in the socioeconomics and diets in South Africa (BFAP, 2016; Labuschagne *et al.*, 2010).

The South African beef market is an extremely diverse system of linkages and different supply and value chains. The farmer or the producer, feedlot, abattoir, wholesaler, processor, distributor and retailer, are direct participants in delivering the products to the relevant market. Other contributors and members in the beef value chain includes the providers of exports and imports; hides and skins; meat processors; providers of packaging, spices and other consumables (Labuschagne *et al.*, 2010). The producers, retailers and the foodservice sector have responded to the increased demand for protein by supplying the market with competitively priced, value-added and convenience products. Currently, retail sales represent more than 50 percent of total meat sales in South Africa, trailed by wholesale (approximately 25 percent) and foodservices (approximately 15 percent), with the foodservice sector growing faster than retail and wholesale trade in recent years (ARC, 2016).

South Africa is a net importer of beef. South Africa imported about 25,000 tons of beef; mainly from its neighbouring countries Botswana and Namibia. Post estimate that the quantity of imported beef will stay constant at around 25,000 tons in 2015 as lower economic growth hinders higher meat demand. Beef imports from overseas underwent a substantial increase since 1994, averaging more than 40,000 tonnes annually up to 1998. Since 1998, beef imports have been between 15,000 and 20,000 tonnes, annually (DAFF, 2011; Phillips, 2013).

The factors affecting the beef imports include:

- Clamping down on fraud by exporters – this includes cases where some beef was tested to be expired but had a labelling of future expiry dates
- The ban of exports due to the advent of bovine spongiform encephalopathy (BSE), Listeriosis and Foot and Mouth Disease. The imports of beef virtually come to a stop in the midst of these crises.
- Also, countries achieving record prices in the EU for their safe beef and reducing the volumes beef to other countries.

2.1.3. Industry pressures

Escalating costs of production, recurrent drought, livestock disease and increasingly stringent food safety legislation are pressuring beef farming supply and profitability, so international beef prices are likely to remain buoyant. In addition, South Africa's beef industry is constantly affected by external factors such as the fluid and unpredictable national political milieu, the recent large-scale labour unrest in the agriculture, mining and transport sectors, and decreases in local foreign investment (Phillips, 2013).

Agriculture also faces the uncertainty of the country's land reform programme and the pressure of significantly higher minimum wages. Land is a very emotive issue in SA, the government is committed to transferring land to landless people. These land claims take several years to be settled. This will contribute to uncertainty, which may impact the investments and the expansion in the agricultural sector negatively (Olivier, 2004). Nonetheless, the Bureau for Food and Agricultural Policy estimates that South Africa's current annual average beef consumption of about 700 000t, second after chicken consumption of about 1,7 million tons, is likely to increase by about 25% by 2020.

Competition for the beef industry will come mainly from the predicted 48% growth in average annual chicken consumption by 2020. Despite experiencing growth in consumption over the same period, eggs, pork and lamb are likely to remain in third, fourth and fifth places nationally. It is important to note that South Africa's annual formal beef production and supply projected as far as 2020 falls short of national demand by about 50 000t per annum. Ideally, this shortfall should be met by locally produced beef (Phillips, 2013).

2.2. Food attributes as influencing factors

Quality and safety are two important elements in consumer food perceptions and decision making associated with food choice (Grunert, 2005). The two have been highly topical for the past 10 years in the public debate, in food policy, in industry, and, last but not least, in research. Several factors have driven this debate. For example, the variety of food scares that have directed public attention to food safety issues (Grunert, 2005). The analysis of the perception of product quality and safety stands as a cornerstone of the analysis of consumers' behaviour. It indicates that the demand for product quality and safety is viewed as part of the growing trend for consumption of natural and healthy food and is linked to greater awareness of health issues. Factors

influencing demand for product quality and safety are found to be linked to the social, economic and cultural context and other factors affecting diet habits (Zaibet *et al.*, 2000).

In general, consumers have considerable challenges in forming quality expectations, particularly for fresh meat for which little information about the product is normally provided. According to Grunert (2005), the formation of meat quality expectations is based on a few key cues, principally labelling (including price) and appearance, which do not seem to be very good predictors of its eating quality. The manifest uncertainty that consumers seem to experience when buying meat and meat products can partially explain the importance that butchers' advice tends to have in their buying decision, as shown in many studies on fresh meat.

Producers, traders and policy makers are increasingly more interested in knowing the importance and the value consumers attribute to particular products and information on food quality and safety associated with them. The need for producers and traders to survive on the market, establishing and incrementing their competitiveness, and for the public decision makers to orientate agricultural, territorial and food policies are some of the main reasons why knowing the consumers' needs and their perceptions about food products is becoming increasingly more important and strategic (Scozzafava *et al.*, 2014).

2.2.1. Food quality

Along with the changes on the relationship between consumers' and food, there has been an evolution of the notion of food quality itself. As such, when it comes to food, society is ever more aware of issues other than simple availability, and the inferred quality dimensions of a product depend on consumers' experience, knowledge, and beliefs, which can vary significantly from one person to another (Alfnes, 2004).

It is important to stress that there is no single generally accepted definition of food quality in the literature as has been widely acknowledged (Vermeulen and Bienabe, 2010). However, states that quality can be defined in utilitarian terms as "fitness for use" or in the context of food as "fitness for consumption". From the customer's point of view, the perception of quality is related to their experiences with a product's performance, or services benefits, as compared to their expectations about a hypothetical ideal (Kenyon and Sen, 2014).

According to the Total Food Quality Model, dimensions of quality are commonly categorized into search, experience and credence characteristics depending on when the consumer can evaluate the quality (Mariana and Thøgersena, 2012). A search quality (like the appearance or colour of a piece of meat) can be evaluated before the purchase, an experience quality (like the taste of the meat) can first be evaluated after the purchase, and a credence quality (like the healthiness of the meat) can, under normal circumstances, not be evaluated by the average consumer at all, but is a question of faith and trust in the information provided. Many characteristics of a food product, like taste, cannot be ascertained before purchase, i.e. most food products have only search characteristics to a limited degree. In order to make a choice, consumers develop expectations about quality, but it is only after consumption that experienced quality can be determined, and even this is limited in the case of credence characteristics for example, the healthiness of a product (Mabhera, 2014).

2.2.2. Food safety

The potential impact of food safety outbreaks on a food business or a company can be devastating. A single event of a foodborne disease outbreak can bring unimaginable economic losses (Hussain and Dawson, 2013). In the absence of food scares, it can be stated that food safety in general is taken for granted by consumers. This is based on the grounds that it is prohibited to place unsafe food on the market. Therefore, consumers generally expect that the food products on the shelves are safe. However, Angulo and Gil (2007) have shown that, overall, consumer confidence in food safety varies according to: the occurrence of food safety incidents and consumer knowledge about food safety issues, demographic and socio-economic factors such as age, educational level and economic status; consumer trust in regulatory institutions and participants in the food supply chain.

Food safety is included in an expanded definition of food quality, and is currently one of the main concerns of food industries, consumers and governments globally (Liana, 2010). Since the focus of the economics of quality, issues related to food safety concerns emerge as information asymmetry problems between consumers and producers regarding the specific characteristics of the product (Greis and Noguiera, 2010). Consumers' perception of food safety represents the level of trust and confidence they have in the food industry and the ability of the government to protect

them through regulations. Consumer behaviours based on these perceptions, whether accurate or not, can have significant impacts on the food industry (Berges *et al.*, 2015)

Consumers would not knowingly consume unsafe food. Food safety can be an experience attribute, or in many cases (e.g. Listeria, BSE, etc.) a credence attribute. Information asymmetry characterizes the market for products with credence attributes, meaning that the seller has more information about true product quality than the buyer (Sanderson and Hobbs, 2006). Therefore, cues associated with food are important in communication media. Cues are pieces of information used to form quality expectations, they can help consumers obtain information about the credence attributes through labels and brands that accompany the product (Jongen and Meulenberg, 2005). There is a need to produce effective communication, distinguishing between cues with an intrinsic nature (e.g., fat, colour, taste) and those with an extrinsic one (e.g., food safety). As such Lees and Saunders (2015), emphasize that the most important method of communicating credence attributes to the consumer is through product labelling.

According to Nocella *et al.* (2010), credibility, reliability and transparency of extrinsic cues must be sufficiently communicated through well-designed labelling so that the associated inspections of production systems can be widely trusted. Traceability systems or third-party certifications are examples of market mechanisms or signals to bridge the gap of information between agents or to reduce the cost of verification. For the effective functioning of these mechanisms passing on information about the "real" quality of products, it is necessary that consumers trust in these signals that ensure the presence of the attributes that differentiate quality. Hence, Prinsloo *et al.* (2012), argue that quality labels are an effective way of communicating product quality to the imperfectly informed consumers in their decision-making process because it structures their information environment and help them to choose products that meet their needs.

2.3. Quality label

With the concern of food safety issues, quality label is defined as an instrument for transforming honest and consistent food product safety relevant information to consumers, which is open, fast and is generated from negative trend of consumers' concern about food safety. Furthermore, it can also be regarded as a medium which

can transform credence attributes into search attributes and is used as an extrinsic quality cue (Xiang, 2012).

2.3.1. Roles of Quality labels

2.3.1.1. Reduction of information asymmetry

The shopper is nowadays provided with an overwhelming amount of food quality labels of different types (private or public; production or process) as in no other economic sector. Labels intend to alleviate possible inefficiencies resulting from imperfect information about product characteristics (Vecchio and Annunziata, 2011). The reduction of information asymmetry is the core task of certification and quality labelling within the market. Labels are a part of the information set used by consumers in making product decisions. Labelling is a strong quality signal and directly helps consumers in making purchase decision process because it can transfer important information about search, experience and credence attributes. Certification systems which are closely related to quality labelling, can assure these inspections, which is why they are becoming popular on all levels of the agri-food chain (Auriol & Schilizzi, 2002). Especially in the field of process attributes, such as meat processing industry, quality labels have turned into the most popular consumer policy tool.

Quality labelling now is not just a guarantee of food safety but also regarded as a tool of transferring critical information of product image or brand image, so that quality labels can improve the quality perception of particular food (Xiang, 2012).

2.3.1.2. Restoration of confidence and trust

Labels can change credence attributes into search attributes particularly when food safety issues happen frequently and consumers do not feel confident about food quality and safety associated with the particular product. Corcoran *et al.*, (2001) stated that labelling can be a way to rebuild consumer confidence in these products which have suffered from a tarnished image. The main purpose of labelling meat is to enhance consumers' quality perception and to regain consumer confidence (Roosen, 2003).

2.3.1.3. Adding extra value to product

Adding value is a customer-oriented concept we only add value to food products to the extent that those consumers at whom the final product is targeted actually perceive these products as better perceive them as having more quality (Grunert *et al.*, 2004).

Quality labels can transform the three dimensions which are health, process and convenience from credence attributes into search attributes, so that they make consumers feel much healthier, safer and more convenient of the food product than to improve their quality perception (de Chernatony and Harris, 2000). A label which is the most important factor of marketing management may perform four functions; they are identifying, grading, describing and promoting the product. These functions are added to food product to differentiate the product from its competitors and also can amplify the attractiveness of food product and assure the consumer of a certain level of product quality (Xiang, 2012).

When referred to agricultural products, consumers may regard a quality label as a tool that protects them in an environment of distrust and for producers, the quality label is regarded as an important element of marketing that provides a great chance to differentiate themselves in the market and add value to their products (Tsakiridou *et al.*, 2007).

2.4. The South African carcass classification system

2.4.1. Characteristics of meat classification:

- **Age**

AAA: This code means that the colour of the roller mark on the carcass is PURPLE and is an indication that the meat is from a young animal (no permanent incisors) and thus the more tender meat.

ABA: This code means that the colour of the roller mark on the carcass is GREEN and is an indication that the meat is from a young animal in transition to an adult animal (1-2 permanent incisors) and thus tender meat.

BBB: This code means that the colour of the roller mark on the carcass is BROWN and is an indication that the meat is from an adult animal (1-6 permanent incisors) and thus less tender but with a lot of flavour.

CCC: This code means that the colour of the roller mark on the carcass is RED and is an indication that the meat is from an adult animal (more than 6 permanent incisors) and thus less tender.

- **Fatness**

It is the right of the consumer to choose how much visible fat they prefer. Fat classes are indicated in the following manners:

000 - no visible fat on carcass

111 - a very lean carcass

222 - a lean carcass

333 - a medium fat carcass

444 - a fat carcass

555 - an over-fat carcass

666 - an excessively fat carcass

- **Conformation**

Conformation consist of five classes defined in the following manner:

1 – Very flat

2 - Flat

3 – Medium

4 – Round

5 – Very round

- **Damage**

Classification considers damage in relation to locality, extent and depth of damage plus fat to meat to bone ratio.

0 – Undamaged

1 – Disturbed to a slight extend

2 – Moderately disturbed

3 – Severely disturbed

Usually, the damage characteristic is used by traders to purchase meat to re-sell since the damage influences the price of the meat if the trader is not aware of what is being bought. This means that the trader will purchase these carcasses at a lower price, depending on the level of damage and on which part of the carcass the damages occur (Malindi, 2010).

2.4.2. Limitations of the classification system

A carcass classification is a system that only describes features of a carcass which are useful in the trading industry, while the grading system involves ranking carcasses based on quality in order of merit from the most preferred to the least preferred grades. Generally, the main difference between grading and classification systems is that the classification system does not measure quality attributes (Soji *et al.*, 2016)

The system is limited in the way that it can only describe those attributes that are measurable or detectable at the point of classification which takes place either on the day of slaughter or at the most the day after. Furthermore, most of the properties described or scored in a classification system are indirect measurements of the actual traits, e.g. age that is recorded as number of permanent incisors, while the other two scores, fat and conformation are only a visual appraisal (predicted) of actual fat content and muscularity or edible yield (Schönfeldt, 2015).

The inspection stamp on carcasses explains that the product has been inspected and approved as meeting a standard set of health and safety guidelines under the supervision of the systems responsible in each country. It also indicates that the product has been prepared in federally inspected facilities and meets guidelines for both local and international trade. However, this stamp or mark as in other countries is not an indication of grade or country of origin; it does not mean the product inside the carton is from that country, safe and of good quality (Webb, 2015).

Mabhera (2015) highlights that producers are more concerned about how much the carcass will weigh and how much they will get for it. According to Strydom (2011), the use of grading system would provide an opportunity to move from carcass based retail description to cut based description and pricing, as consumers do not eat carcasses but portions of meat derived from cuts. This can provide an incentive to improve eating quality of the full range of carcass muscles as the return is based on performance rather than traditional cut relationships. Payment based on consumer satisfaction can be a powerful tool to stimulate industry change.

2.4.3. Importance of graded beef in South Africa

The major constraints to the growth of the beef industry are lack of the prerequisite institutional framework, inadequate research based on ecological potential for beef development, endemic and emerging livestock diseases, and recurrent droughts,

vulnerable traditional pastoral production systems, diminishing animal genetics, poor marketing channels and static prices of beef products (Bergevoet and Van Engelen, 2014). Lack of consumer-oriented communication from the industry has been cited as one of the main problems of the meat sector (Murphy, 2012). Meeting consumer expectations of quality and supplying them with reliable, impartial information will enable the meat industry to stay in business or to expand (Labuschagne *et al.*, 2010).

Compared with other production systems around the world the production environment of the South African beef industry poses some unique problems when it comes to focusing on production of quality beef (Griffith *et al.*, 2010). Consumers are now questioning the economic, ecological and ethical sustainability of conventional meat production (Kumm, 2002; Capper, 2013). They demand meat that is safe, nutritious, convenient, produced through acceptable methods and of good eating quality (Sofos, 2008). These consumer characteristics are due to the proportionally related to the increase in human population, standard of living, urbanization and the desire for a more varied diet (Ngubane-Kunene, 2014).

In South Africa labelling information observed at independent butchers focuses mainly on price, store name and packaging date. Selected brands offered by large retailers indicates more advanced labelling information, but very limited application of quality characteristics and red meat classification information is observed (Vermeulen, 2015).

The industry needs to promote the goodness of beef and address negative media coverage by presenting the correct facts. Booysen (2007) states that the generic marketing of beef rests on four pillars, namely enjoyment and appetite appeal, versatility and value, health and nutrition, confidence and assurance. The marketing levies should be used to promote the four pillars, as they are aligned to customer needs and preferences. Consumer marketing will help to build the positive image of beef. Marketing tools such as branding, labelling and trademarks may promote customer assurance to a large extent in the beef industry and some suppliers have already successfully developed niche markets for their branded products (Labuschagne *et al.*, 2010).

2.4.4. Recent progress to label beef quality – world view

Organization of the beef supply chain to consistently meet consumers' expectations for eating quality requires that differences in those product attributes most valued by

beef consumers be accurately identified and clearly communicated across the entire beef chain. This presents a challenge for the beef industry, in part because the primary attribute of interest, taste, is an “experience attribute”, meaning, consumers cannot assess a beef product’s performance and value until they have tasted it. Because a beef product’s flavour, juiciness, and tenderness cannot actually be determined and verified beforehand, the beef industry has been forced to rely on other, indirect approaches for assessing beef sensory attributes and transmitting market signals that reflect differences in product performance and value from sector-to-sector between consumers and cattle producers (Tatum, 2015).

EU quality labels have been introduced as a decision-aid to consumers, but they are also a means of food control, in that the presence of the label gives assurance about the traceability of the product to an area of production and/or the application of a specific set of competences and know-how. This is a process-related quality assurance, although considerable effort is going into find product related means to ascertain the authenticity of this type of products (Reid *et al.*, 2006). From a consumer perspective, EU quality labels can therefore reduce uncertainty associated with food purchases both regarding desirable product characteristics (like a preferred taste) and with regard to the underlying production process, including the product's origin (Bonny *et al.*, 2013).

The Spanish government began regulating beef traceability and labelling in 2003. After two years of transition, mandatory traceability was introduced in 2005. Quality assurance marks are held in high regard by Spanish consumers, the Protected Designation of Origin (PDOs) have been emphasized in promotional campaigns, highlighting the quality and safety attributes of products from a particular region (Angulo *et al.*, 2007).

The Canadian Beef Grading system has been developed so that consumers of Canadian beef can have confidence in the quality and consistency of the product they purchase. There are four quality grades, chosen by the combinations of fat colour, muscling and fat depth, being AAA, AA, A and Prime. Any product not marked with a Canada Grade name is labelled “ungraded” or bear the grade designation of the country of origin (Polkinghorne and Thompson, 2010).

The Meat Standards Australia (MSA) beef grading system is described as a useful tool for the assessment of beef palatability in a commercial environment. An important distinction in relation to previous and alternative commercial beef grading systems is that the MSA grading scheme assigns a grade to a specific piece of beef cooked by a designated method; it does not assign a single grade to an entire carcass (Watson *et al.*, 2008). It predicts a palatability score (on a 0–100 scale) for each cut, cooking method combination and according to different factors including ageing time.

The United States beef trade, convey information about the quality of the product to consumers is through a USDA (United States Department of Agriculture) grading system. The grading system has three main functions. First is to provide information to producers to assist in receiving prices that correspond to the quality of livestock they produce. Second is to provide consumers, retailers, and institutions with meat supply that is uniform in quality and possesses desirable characteristics. Third is to facilitate beef marketing by separating a highly variable population of live cattle and/or beef carcasses into groups which are more uniform in quality and composition to consumers (Reicks, 2006; Fisher, 2007).

The current USDA grade-based beef structure stratifies carcasses and beef cuts produced by youthful, steers and heifers into seven marketing categories (Prime, Choice, Select, Standard, Commercial, Utility and Cutter), based on degree of marbling and associated differences in expected eating quality. The majority of the beef sold at local supermarket fall into Prime, Choice or Select. “Prime” has the most amount of marbling, which is supposed to guarantee taste, tenderness and juiciness. “Choice” is typically lower in cost and quality, but still provides good beef. USDA “Select beef” is the lowest grade of beef. It is much leaner than ‘Prime’ or ‘Choice’ (Tatum, 2015).

Lastly, there is the use of non-official labels which includes certified products differentiated from standard products by some specific characteristics or products highlighting a specific feature (such as meat produced from grass-fed animals or ‘grain-fed’ or ‘on-farm processed’ or ‘mountain produced’). There are in fact many beef schemes related to areas of geographical origin, brands, and/or breeds for example, specialist Hereford or Aberdeen Angus beef and beef products (Hocquette *et al.*, 2014).

2.5. Review of past literature

2.5.1 Beef attributes and consumer WTP

Many studies have reported on meat attributes and WTP. Some of these attributes are price, fat content, cholesterol, sodium content, artificial ingredients, safety, traceability, place of origin. For instance, Reicks (2006), examined the consumer motivations and the impact of brand on purchasing preferences of fresh beef. When consumers were asked if USDA Choice and USDA Select were fresh beef brands, 18.8% responded yes, 55.8% said yes and 25.4% reported that they did not know. Consumers were asked if they purchased fresh beef based on brand and results showed that most of them said no. Consumers obviously realize the presence of branded food products, but branded beef products are more complex in their variability. Also, consumers do not fully understand the information regarding the current grading system and beef product variation.

Vermulen and Bienabe (2008) evaluated the South African consumers' present food quality with a specific focus on "conventional" and "advanced" quality attributes associated with fresh food produce (fruit / vegetable and meat). It was found that when selecting food purchase outlets and fresh food products, South African consumers mostly apply 'conventional' quality and convenience considerations (e.g. appearance, taste). Even though the credence attributes such as, animal welfare, environmental practices, safety are generally less important the results also demonstrate that they already have a relatively significant foothold in the local market, being more established for higher living standard measure (LSM) groups in particular and suggesting potential opportunity for market growth.

Watson *et al.*, (2008) evaluates the WTP by consumers for the defined levels of eating quality and interactions with consumer demographic factors and meat consumption preferences. Consumers from each country (Australia, the United States, Japan and Ireland) scored WTP for the different grades in units of their relevant currency. Japanese consumers showed the greatest increase in WTP estimates for quality, followed by the United States consumers, Australian and Irish consumers were last with the smallest increase in WTP with increased quality. In all countries consumer age interacted with quality grade, with consumers in the age range 25-35 years willing to pay more for quality, compared with older consumers. Other demographic factors

and meat consumption preferences had little impact on consumers relative WTP for eating quality.

Chung *et al.*, (2012) identified three distinctive groups of grocery shoppers based on their level of concern (very, moderately, and not too concerned) about the use of antibiotics and genetically modified organism feed ingredients in beef production. It was reported that the very concerned group values such attributes as antibiotics-free, genetically modified organism-free, and domestic production the most among the three groups. Also, that the most important factor in determining grocery shoppers' WTP is country-of-origin for all three groups.

Keketso and Oladele (2012) examined factors influencing beef purchase among consumers in Mafikeng, South Africa. The most effecting factors for Mafikeng consumers to buy beef is because of the considerations on beef parts, price, more varieties for cooking, suggestions from known person and the beef colour quality. According to the author, the majority of consumers are married, and have a high education level with a middle income. They only purchase their beef when pressed for time or looking for something extra special. Consumers mostly bought fresh and dried beef for household consumptions. The meat is mostly bought from butcheries, as it provides best value for money.

Adepoju and Oyewole (2013) determined Households' perception and WTP for bread with cassava flour inclusion in Nigeria. Findings suggest that bakery owners adopting the use of cassava flour in bread production pay careful attention to the taste, packaging, size, colour and price of the bread since these variables affect the buying decisions of the consumers.

Scozzafava *et al.*, (2013) analysed the Italian consumer preferences for beef using the choice model approach to assess consumer behaviour. The results highlight the crucial importance of beef cut in the final choice, and reaffirm the central role played by the country of origin labelling (COOL). On the contrary, breed information and price marginally affect the final purchasing decision.

According to Owusu-sekyere (2014) who examined consumers' preferences and WTP for beef product attributes. The Ghanaian consumers' in general prefer and rate shopping environment, packaging, leanness, certification, tenderness, steak colour and freshness as the most important attributes considered in purchasing beef products

respectively. Consumer characteristics significantly influenced preferences and WTP for beef products. Young, low and middle-income consumers were more concerned with origin, steak colour and certification of beef products and were willing to pay for those attributes.

Berges *et al.*, (2015) investigated consumers' perceptions of safety in Argentina and identified factors that helped explain consumers' WTP for different attributes related safety of the beef products, including, a hypothetical hygiene certification in handling and retailing. Consumers' were WTP for fresh meat attributes such as personalized attention in a butcher counter, the presence of a "safety certification" in the place of purchase and the bright red colour on the product.

Dobbs (2015) examined consumers' WTP for beef produced in Tennessee. Consumers were willing to pay premiums for both steak and ground beef. Price conscious consumers were less willing to pay a premium for steak. Consumers who valued grain-fed, flavourful beef products were more likely to purchase and pay more for steak. Also, consumers who valued freshness, safety, and natural production were more likely to purchase and pay more for ground beef. Grass-fed label, natural label, colour, juiciness, freshness, lean, and humane treatment of animals had no significant effects on WTP more for steak. Whereas, grain-fed label, grass-fed label, price, colour, flavour, juiciness, tenderness had no significant effects on WTP more for ground beef.

Lewis *et al.*, (2017) evaluated German and British consumer WTP for beef labelled with food safety attributes. Results showed that British consumers had the lowest WTP for beef from Argentina and German consumers had the lowest WTP for beef from Great Britain. In both the nations, the hormone-free label was the highly preferred label by consumers and those who considered food safety issues to affect their meat consumption patterns.

2.5.2. Socioeconomic factors and willingness to pay

After reviews from several studies which conducted by researches, minority of the researchers had argued that there is no significant result show between a few independent variables for food products. However, majority of the researches support that independent variable have a positive relationship with the consumer WTP.

Campiche *et al.*, (2004) assessed impacts of consumer characteristics and perceptions on WTP for natural beef. They reported that consumers with household

incomes greater than \$100,000 were willing to purchase natural beef than respondents with an annual household income of between \$40,000 and \$69,999. Furthermore, consumers' gender, age, household size, and educational level did not have statistically significant effects on WTP more for natural beef.

Peters-Teixeira and Badrie (2005) investigated consumers' perception of food packaging and its impact on food choices. The packaging feature that influenced most of the respondents' choice of products was information on the label, quality and type of packaging, brand name/popularity and visual impact. Most respondents (92.7%) believed that packaging material could adversely affect the quality of performance of a food product. Also, 92.7% of respondents agreed that nutrition information should be shown on all food products, although 36.6% admitted that they do not read the label because of its complexity. Influence of gender was not significant on consumer WTP and perception of food packaging. Prinsloo *et al.* (2012), also found that packaging and food label information influence consumers' purchase decisions throughout the consumer decision process and that these influences have become particularly intricate in recent years.

Angulo *et al.*, (2005) evaluated consumers' WTP a price premium for certified beef. Results showed that age and income had positive and significant effects on WTP a price premium for certified beef. Older respondents and respondents with higher incomes were willing to pay a premium for certified beef. Also, respondents who frequently bought beef were more willing to pay a premium for certified beef. However, education did not have any significant effect on WTP a price premium for certified beef.

Kimenju and De Groote (2005) conducted a study in Nairobi to determine attitudes and WTP for GM maize meal using the double-bounded logit model. The results indicated that, 38% of the respondents were aware of GM crops. Most consumers believe in the technology's positive impacts, but are concerned about environmental and health risks. Majority (68%) would buy GM maize meal at the price of their favourite maize meal brand. The mean WTP for GM maize meal is KShs 58, a premium of 13.7% over mean average price of favourite brands. WTP is influenced more by subjective than socio-economic characteristics.

Engel (2008) analyzed the determinants of organic food in SA, specifically organic fruit juice and wine. Empirical results from this study show that socio-demographic factors

do influence South African consumers' decision to purchase organic food and younger age increases the probability of the decision to purchase organic food; whereas being married and being in possession of non-formal training qualifications decreases this probability.

Lyford *et al.*, (2010) investigated the effect of consumer demographics and meat consumption preferences on WTP for beef quality grades. The authors reported that age was the only significant factor affecting WTP. Older consumers were more likely to pay more for beef quality than younger consumers. Income, number of children in the house, number of adults in the house, main grocery purchaser, occupation, and gender did not have significant effects on WTP for quality beef.

Emukele *et al.*, (2012) investigated the potential consumers' WTP for camel milk. Results show that the likelihood of WTP for the camel milk amongst potential consumers who are aware of camel milk being processed and consumed elsewhere is three times more than those who are not aware. Other than awareness, employment status, total household income, age, level of education and family size have no significant effect on WTP. The potential consumers are willing to pay a 7% premium on the camel milk above the price of a unit volume of camel milk.

Adepoju and Oyewole (2013) determined households' perception and WTP for bread with cassava flour inclusion in Nigeria. The study revealed that households' WTP for bread with varying degrees of cassava flour inclusion is influenced particularly by the premium price (bid), household income, age and the share of bread in total household food expenditure.

Radam *et al.* (2013), determined consumers' perceptions, attitudes and WTP towards food products with "No Added MSG" labelling on data collected from areas within Klang Valley. The results show that price, household size, household income, family members below the age of 12, female and university level are the most vital and significant factors that influence and determine the total premium that an individual was willing to pay for these products.

Sriwaranun *et al.* (2013) investigated the factors affecting consumers' WTP a premium price for organic products. Results display that respondents are willing to pay a premium price of 88% for Chinese kale, 51% for jasmine rice and 51% for organic

pork, if respondents experienced, good health, strong ethical and environmental in purchasing organic products.

Alinda *et al.*, (2016) determined consumer WTP for quality beef in Uganda. They reported that income and beef attributes such as fat content, bone content, colour of the lean and fat influenced the WTP for quality beef. Consumers preferred less fatty than very fatty beef and less boney than meat with many bones.

2.6. Methodological review

The literature classifies the different methods for estimating WTP into revealed and stated preference methods. Depending on the type of goods or services in question both methods can be useful. Revealed preference methods (RP) refer to the observation of preferences revealed by actual market behaviour and represents real-world evidence on the choices that individuals exercise. Moreover, RP data provides valuable information for modelling choice behaviour as the choices reflect decisions that have been made (Heywood and Stephens, 2010).

In some cases, however, the behaviour that is of interest to the analyst may not be observable or currently available. For example, there may be a requirement to evaluate the impact of the introduction of competition where competition has previously not existed or there may be a requirement to quantify the impact of a reduction in competition caused by a proposed merger. In each of these cases it is necessary to make judgements about potential impacts in the absence of real-world evidence on how individual consumers may respond (Heywood and Stephens, 2010).

Stated preference (SP) methods allow examination of such hypothetical situations. The SP approach has been used in the economic valuation of non-market goods and services marketing and in food economics. It is also used to estimate WTP for new products and products' attributes (i.e. quality). The technique uses surveys presenting hypothetical choices to gather data from consumers. One advantage of the technique is that it allows researchers to understand how consumers respond to novel goods and services and to predict demand when market data is unavailable (Sriwaranun *et al.*, 2015).

Some key differentiating characteristics of the two methods are shown in Table 1.

Table 1: Revealed and stated preference methods

	Revealed preference	Stated preference
Approach	Consumers' preferences are revealed through their actions in real markets	Consumers are asked to state their preferences for hypothetical scenarios/alternatives that comprise a set of attributes and different levels of these attributes
Methods	<ul style="list-style-type: none"> • Hedonic pricing • Discrete choice • Travel cost 	<ul style="list-style-type: none"> • Contingent valuation method • Choice experiments • Contingent ranking • Conjoint analysis
Data	<ul style="list-style-type: none"> • Obtained from past behaviour of consumers 	<ul style="list-style-type: none"> • Collected through surveys
Advantages	<ul style="list-style-type: none"> • External validity is maximised because the choices observed are real market choices in which consumers have committed money, time and/or other resources • Low-cost evaluation 	<ul style="list-style-type: none"> • Provides preferences and information that are otherwise impossible to reveal when actual choice behaviour is restricted in some way • Provides significant advantage when historical data do not suit the objective or when data does not exist from history
Disadvantages	<ul style="list-style-type: none"> • Limited to supply of information regarding values that have been experienced • Limited number of cases where non-market values/goods exhibit a quantifiable relationship with market goods • Choice sets, attributes of choice options and individual characteristics 	<ul style="list-style-type: none"> • Observed preferences may not reflect actual behaviour • Absence of incentive for the respondent to provide accurate responses • Incentive for respondent to behave strategically • Overall costly evaluation (more complicated to design and analyse, and also costlier to undertake survey as show

	are not controlled and/ designed a <i>priori</i> but rather occur/co-occur	material often required for more complex choice task) <ul style="list-style-type: none"> • Vulnerable to violation of economic decision-making
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Source: adapted from Heywood and Stephens, 2010)

Brief description of the methods

Travel cost method

Estimates the demand for sites using travel costs, which are considered to reveal the individuals' WTP for those sites. Time and money spent on visits leave trail of indirect evidence about the WTP for the services and amenities provided (Viegas, 2013).

Hedonic price method

The Hedonic Price Method (HPM) is generally used in environmental and natural resources economics and in real estate economics. The HPM consists of the analysis of the price of differentiated goods based on their characteristics. Requires market data and attributes (e.g., housing or land) and environmental metrics. Cannot assess impacts that do not vary across regions and implicitly assumes that people respond to environmental quality of interest. Theoretically accounts for different land use decisions.

The HPM has also been used in the analysis of WTP for a product. The concept underlying the HPM is that the price of a heterogeneous good is a function of attributes of that good (Jerop, 2012). Its application tries to capture the relative importance of each of the attributes to price. The model has been used in several analyses among them; determining the attribute values of beef (Schulz *et al.*, 2010), tomatoes (Huang and Lin, 2006), Soybean (Choumert and Phélinas, 2014) and corn seed (Jorge and Karen 2014). Alinda *et al.* (2007), used the HPM to determine the quality attributes and socio-economic characteristics that influenced the choice of beef bought by consumers and influenced their WTP.

Choice experiments (CE)

Uses hypothetical markets to make individuals choose from a choice set comprising goods representing different combinations of the same attributes. One of the attributes

is a price variable. The repeated choices of favoured goods in a set allow for indirect derivation of WTP (Mangham *et al.*, 2009).

Contingent ranking

Uses hypothetical markets to make individuals rank goods in a choice set comprising goods representing different combinations of the same attributes. Contingent rating uses hypothetical markets to make individuals rate goods in a choice set comprising goods representing different combinations of the same attributes (Slothuus *et al.*, 2002).

Conjoint analysis

Conjoint analysis is designed to determine the trade-offs among product attributes. It is usually based on rankings or ratings on product profiles. Each profile is defined as a set of attributes, including price. The explicit trade-offs between attributes provide a more realistic approach and helps quantify and predict the individual's overall judgement of a product based on its most important attributes (Owusu-sekyere 2014).

Contingent valuation method

The contingent valuation method is the most useful technique for estimating economic values for some nonmarket resources. Also, it can estimate existence values which are theoretically meaningful aspects of value, and very useful in hypothetical market situations. The CVM offers respondents one or sometimes two alternatives to evaluate, and thus improved response rate. This method will be used for the purpose of this study, as it provides a holistic view of a product by determining consumers' WTP and delivers a better understanding of consumers' relative preferences, which can be used to improve the information about a beef product.

CHAPTER THREE

METHODOLOGY

This section is devoted to the methodology used in the study, it focused on the study area, sampling method and analytical techniques employed in correspondence with each of the objective used. Consumers' WTP and contingent valuation method, and the estimation of mean WTP are discussed. The empirical discussion on the factors influencing WTP.

3.1. Study Area

The Limpopo Province is one of the nine provinces of the Republic of South Africa. It is situated in the far northern part of the country. The province is adjacent to the North West province, Gauteng and Mpumalanga and shares international borders with Botswana, Mozambique and Zimbabwe. This serves Polokwane as the capital city. Limpopo Province's landmass of 125 755km accounts for 10.3% of the total land of South Africa, and the provincial population of 5.7 million represents 10.4% of the national population. The province is divided into five districts, namely: Vhembe, Mopani, Capricorn, Waterberg and Sekhukhune.

The study was conducted in Polokwane Municipality of Capricorn District. The municipality was selected because it is the largest metropolitan complex in the north and a major economic centre with 38 wards contributing 13% to the provincial GDP. The municipality is the most urbanised and has the highest population size of 628 999, increasing at a rate of 2.31 to 5.61% (STATS SA, 2016), which indicates a high potential for beef consumption.

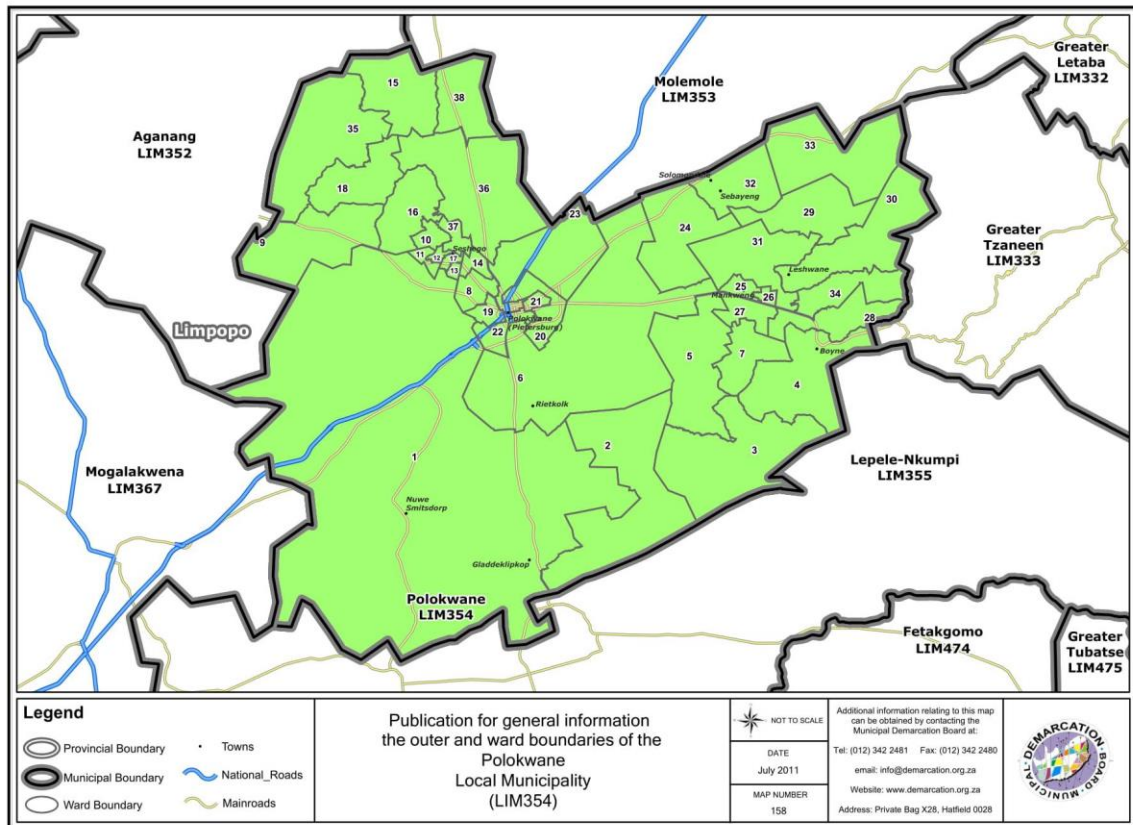


Figure 1: Map of Polokwane municipality

3.2. Data Sources

The data used in this study were both primary and secondary data. The data collected included information on the socio-economic factors of beef consumers such as; age, gender, ethnicity, level of education, occupation, income, household size and awareness of beef safety and quality. To assess how much consumers were willing to pay for beef, respondents were asked to state their WTP using the current normal price of beef as the first bid. A follow up bid, either a premium or discount was then presented to potential consumers in response to the initial bid. If the respondent accepted the first bid, the follow up bid was higher than the initial bid and vice versa. Secondary data was obtained by reviewing the literature from documented book chapters, annual reports, journals, newsletters and other published sources relevant to the study.

3.3. Data collection tool

A structured Contingent valuation (CV) questionnaire was a key survey instrument used to interview the consumers. It was composed of both open and close ended

questions. The questionnaire was translated into the vernacular (Sepedi) language for ease of administration where the understanding of the English language was poor.

CV survey questionnaires of this study have three different parts. The first sections provide general information relating to socioeconomic characteristics of respondents; such as gender and age, employment status, source of income, monthly income, and ethnicity. The second section contained Likert scale questions on consumers' food safety concerns, health issues, product characteristics, and their ability to tell the quality of meat by visual assessment, consumption patterns. The final section contain information on consumers' WTP for graded beef. The WTP questions were design with double-bounded, dichotomous choice contingent valuation format. The contingent valuation method questions were included in the survey instrument to assess consumers' WTP a premium for graded beef. The survey questionnaire was pre-tested in 10 households at Seshego and Mankweng, areas of Polokwane municipality.

The structured questionnaires consisted of open-ended and close-ended questions. The close-ended questions gave the respondents pre-coded responses in which the respondents selected the option they agreed most. The open ended format was used on the pilot survey to come up with the starting bids. In the double-bounded, dichotomous choice contingent valuation part of the questionnaire, the consumers were presented with a first bid. The consumer who accepts initial amount was given a second bid which is higher than the initial bid. The second bid was varied among the respondents. On the contrary, where the consumer declined the initial bid, a second lower bid was offered.

A total of 150 questionnaires were valid and included in the data analysis accordingly. The data were analysed in two ways. First, a descriptive analysis of important variables was conducted using frequency distributions and mean tests. Second, the association of graded beef's WTP with socioeconomic characteristics and product characteristics were analysed using logit regression analysis.

3.4. Sampling techniques and Sample size

The target population of this study was all consumers from both gender groups responsible for purchasing and preparation of beef in their households residing in the Polokwane municipality of Limpopo province, South Africa.

A two-stage stratified sampling procedure was employed in this study, based on the income stratification of households in the city. The income stratification supports the widely-held view that incomes of households influence their consumption patterns (Owusu and Anifori, 2013). For the first stage, the areas were purposefully sampled. In all, a total of 9 areas were considered in the survey for this study; 3 areas from low income group, 2 areas from middle income group and 4 areas from high income group. At the second stage, households were randomly selected from the various areas.

Table 2: Distribution of households within the sampled areas

Income category	Areas	Number of households
Low income group	Moletjie	20
	Mmotong	14
	Bloodriver	16
Middle income group	Seshego	28
	Mankweng	22
High income group	Bendor	8
	Flora park	20
	Serala view	17
	Thornhill	5

Source: Author's survey data, 2017

Data was collected from a total sample size of 150 respondents from representative households. 50 households from each of the three income categories were selected by simple random sampling and the head of the household was regarded as the buyer and preparer of beef.

3.5. Data and Procedures

Respondents were previously informed about the prospective availability, the characteristics, and the grading process of beef. The wording of the elicitation question for those persons presently consuming regular meat was as follows: Imagine in a usual shopping incidence, you see two choices of fresh beef in the meat section. The one has no labelling and the other is differentiated by a label with meat quality grades on

it, would you buy it. Three answers were prompted: Yes, I would buy it in the same quantity I'm currently consuming; Yes, but I would buy less than what I'm currently consuming. These respondents were also asked about the price they presently paid for regular meat.

To avoid a question order bias, six different versions of the questionnaire were randomly submitted to the respondents, each different for the ordering of the questions and/or of the provided answers. The bid vector of the prices was set based on a preliminary inspection of regular beef prices. Graded beef is supposed to be more expensive than regular meat, due to higher production costs and to specialised distribution.

Bid prices were therefore set higher than, or equal to, first-rate quality meat currently on sale. Bids were randomly submitted to the respondents. When the respondent stated to be willing to pay the first bid price, he/she was asked a second bid price, higher bid. If the respondent was unwilling to pay the first price, then he/she was asked a second one, lower bid.

3.6. Ethical consideration

Consent to carry out the study was approved and issued by the University of Limpopo, Ethical Clearance committee.

3.7. Analytical techniques

3.7.1. Descriptive statistics

Descriptive statistics was used to analyse the socioeconomic parameters that characterize beef consumers.

3.7.2. The contingent valuation method (CVM) and WTP

Contingent valuation method (CVM) is an analytical tool commonly used to reveal the public's WTP to protect non-marketed resources, such as recreation, wildlife, and environmental quality (Lin *et al.*, 2002). In examining the viability of a new product, cost of production and consumer demand for the product have to be taken into consideration (Kimenju and De Groote, 2005). Studies which have evaluated products or services that are not yet on the market asked consumers to value their products contingent upon market availability of the product (Owusu, 2009). This helps to determine the consumer demand or WTP for such products in a hypothetical markets

situation. These markets are set up using CVM where consumers are asked to value a new product (Lusk and Hudson, 2004). That is directly asking consumers in a survey on how much they would be willing to pay for the new product.

The Contingent Valuation method is a survey-based technique used to examine how consumers evaluate goods and services not found in the market place (Venkatachalam, 2004). This method is used to estimate non-use values and nonmarket use values, and it is the most widely used method for estimating non-use values. While the conventional revealed preference methods such as travel cost method are not capable of capturing non-use values, the only method that is identified for estimating these values is the contingency valuation (Owusu, 2009).

The contingent valuation method is generally used for the goods that do not have markets, so the demand is not observable directly (Owusu, 2009). However, it can be applied in this study where the market is not mature and the availability of the specified product is less (Gil *et al.*, 2000). The dichotomous choice model will be used in analysing WTP. The model will be responsible for aggregating all the consumer responses to price (bid) levels for graded beef and will eventually give a basis for calculating the mean WTP. The dichotomous choice model is appropriate because it takes into consideration the two responses simultaneously.

When the data is qualitative, rather than quantitative, the dependent variable is generally discrete. This type of data can be transformed into continuous variable and analysed by using either one of the link models. Appropriate models are logit, probit and tobit. When the response-based data and a binary WTP are considered to be analysed, probit and logit models are chosen because they non-linear and use the principle of maximum likelihood to estimate the parameters. The underlying distribution of the probit model is normal, whereas logit follows logistic distribution. The Logit model is widely used because it has a higher density mass at the margins and allows the transformation of categorical data into quantitative data, and gives the probability for the odds. In this study, the logit model was adopted because the logistic distribution is similar to the normal distribution function with a simpler form (Jerop, 2012).

In double bounded dichotomous choice questions, as stated in Loureiro *et al.* (2002), the respondent is presented with a first bid (B) for the good in question. Then the

second bid follows contingent upon the former one; i.e. if the respondent says “yes” to the first bid, a higher bid is offered (B^H) since the respondent has a higher WTP than the first bid, and if the response to the first bid is “no” it is followed by a lower bid (B^L) since the first bid is greater than WTP. As it is mentioned before, the bid amounts to elicit WTP are determined both by considering the ongoing prices in the market and the results of the pilot survey. Depending on the initial value, a set of price discounts or premium was distributed randomly across respondents in the survey, which permits us to place both an upper and a lower bound on the respondent's unknown true WTP (Lin *et al.*, 2002). The random price discounts or premium are inclusive of all the possible values, including 10, 20, 30, 40, and 50%. The double bounded dichotomous choice questions either restrict the range in which the true WTP lies, or sharpen the edges of the ranges; which is counted as one of the advantages of double bounded dichotomous choice contingent valuation method.

As mentioned in Loureiro *et al.* (2002), the four possible combinations of responses to the questions are:

- (a) “yes” to both bids (YY),
- (b) “no” followed by a “yes” (NY),
- (c) “yes” followed by a “no” (YN), and
- (d) “no” to both bids (NN).

There are four discrete outcomes of the bidding process that are observable and can be listed in categorical as follows:

- 1) a “yes” to the initial bid - WTP is greater than the highest bid, $B^H \leq WTP$
- 2) a “no” followed by a “yes” in the second bid - WTP lies between the lower bid and the initial bid, that is, $B^L \leq WTP \leq B$
- 3) a “yes” followed by a “no” - WTP lies between the initial bid and the higher bid, that is $B \leq WTP \leq B^H$
- 4) “no” to both bids - WTP is lower than the initial bid, that is, $WTP < B$.

In these inequalities, the WTP refers to the willingness to pay of consumers for graded beef and it is taken as a substitute of the price. The WTP function is represented as:

$$WTP = \alpha - \rho B + \lambda'z + \varepsilon \quad (1)$$

The model expressed in the terms of the probability of purchasing graded beef to a bid amount then takes the form:

$$Pr \{WTP \leq B\} = \Phi (\alpha - \rho B + \lambda'Z), \quad (2)$$

Where WTP : the minimum acceptable price discount (in percent terms) for graded beef

B : the bid price (in percent discount) offered to graded beef,

Z : a set of observable characteristics for consumers,

Φ : a cumulative normal or logistic distribution function,

α , ρ and λ : unknown parameters and

ε : a random term

Therefore, the choice probabilities of purchasing graded beef for respondents that fall in the above four discrete outcome groups are as follows:

$$(1) \text{ the YY group, } Pr \{B^H \leq WTP\} = 1 - \Phi (\alpha - \rho B + \lambda'Z) \quad (3)$$

$$(2) \text{ the YN group, } Pr \{B \leq WTP \leq B^H\} = \Phi (\alpha - \rho B^H + \lambda'Z) - \Phi (\alpha - \rho B + \lambda'Z) \quad (4)$$

$$(3) \text{ the NY group, } Pr \{B > WTP \leq B^L\} = \Phi (\alpha - \rho B + \lambda'Z) - \Phi (\alpha - \rho B^L + \lambda'Z), \quad (5)$$

$$(4) \text{ the NN group, } Pr \{B > WTP\} = \Phi (\alpha - \rho B^H + \lambda'Z), \quad (6)$$

Combining the probabilities of the four outcomes, the log-likelihood function for a sample takes the form:

$$\begin{aligned} \ln L = \sum \{ & I_{d=1} \ln [\Phi (\alpha - \rho B + \lambda'Z)] + I_{d=2} \ln [\Phi (\alpha - \rho B + \lambda'Z) - \Phi (\alpha - \rho B^L + \lambda'Z)] + \\ & I_{d=3} \ln [\Phi (\alpha - \rho B^H + \lambda'Z) - \Phi (\alpha - \rho B + \lambda'Z)] + I_{d=4} \ln [1 - \Phi (\alpha - \rho B + \lambda'Z)] \} \end{aligned} \quad (7)$$

Where $I_{d=1}$, $I_{d=2}$, $I_{d=3}$ and $I_{d=4}$ are binary variables with 1 denoting the occurrence of that particular outcome, and 0 otherwise. The parameters are estimated by maximizing the log-likelihood function of the four discrete outcomes (Jerop, 2012 Lin *et al*, 2002). The mean WTP is calculated by α / ρ

Where, α is the coefficient of the intercept term and ρ is the bid price

3.7.3. Effects of socio economic characteristics on WTP

The demand for quality products are determined by different sets of variables compared to the traditional market demand analysis. Every consumer perceives quality differently so it is normal to find that one consumer's utility would increase as particular quality attribute increases, whereas another consumer's utility decreases for the same quality (Kimenju *et al.*, 2008). Demand for products therefore depends on an individual's perceived qualities, which are subjective implying the demand is influenced by an individual's knowledge and perception of that quality as well as product attributes or characteristics associated with the quality.

As Kimenju and De Groot (2005) have indicated, WTP is influenced by consumer's knowledge and perception, in addition to price and socio-economic factors. Moreover, consumer's WTP may be influenced by individual's tastes and preferences, income, and perceptions on the products, in addition to household and socio-economic characteristics (Cranfield and Magnusson, 2003).

The Logistic regression method is specified to analyse the relationship or dependence of WTP on socio-economic characteristic.

The model is as shown in the Equation below:

$$WTP = \beta_0 + \beta_1 Age + \beta_2 Gen + \beta_3 Ethn + \beta_4 Edulevel + \beta_5 MARSTAT + \beta_6 HH + \beta_7 Empl + \beta_8 HI + \beta_9 Awa + \beta_{10} Fre + u_i \quad (8)$$

Table 3: Description of variables and expected signs

Dependent variable	Description	Unit of measure	Expected sign	Literature review
WTP	1 if consumers are willing to pay for graded beef	dummy	+	Berges <i>et al.</i> , 2015. Alinda <i>et al.</i> , 2016.
Independent Variable	Description	Unit of measure	Expected sign	
Age	Age of the respondent	years	+	Lynford <i>et al.</i> , 2010.

Gender	1 if respondent is female, and 0 if otherwise	dummy	+	Sekhampu, 2012.
Ethnicity	1 if black, and 0 if otherwise	dummy	-	Sekhampu, 2012.
Education level	1 if tertiary education, and 0 if otherwise	dummy	+	Owusu-sekyere, 2014.
Marital status	1 if married, and 0 if otherwise	dummy	+	Keketso and Oladele, 2012.
Household size	Size of the household	number	-	Kimenju and De Groot, 2005.
Employment	1 if employed, and 0 if otherwise	dummy	+	Emukele <i>et al.</i> , 2012.
Income	Income of the respondent	rand	+	Alinda <i>et al.</i> , 2016. Radman <i>et al.</i> , 2012.
Awareness of beef grading	1 if respondent is aware, and 0 if otherwise	dummy	+	Lynford <i>et al.</i> , 2010.
Frequency of beef purchase	1 if frequently purchasing, and 0 if otherwise	dummy	+	Jerop, 2012.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

This chapter includes four sections: the first section provides socioeconomic characteristics of consumers Polokwane municipality; the second section presents consumers' behaviour where, awareness of beef grading system, purchasing decisions, consumer preference with regards to quality beef and beef safety concerns are discussed. The third section presents consumers' WTP for graded beef. The last section provides the effects of the socioeconomic characteristics on WTP.

4.1. Descriptive statistics

4.1.1. Consumers' socioeconomic characteristics

The results of the socio-demographic characteristics of beef consumers sampled are as shown in Table 4 below. The results are based on a sample of 150 completed questionnaires administered in October 2017. This is based on households in the Polokwane municipality. From the total sample, 63.3% of the respondents were females and 36.7% were males. The high percentage (63.3%) of females is due to the fact that, the target respondent for the study was the person in charge of either food purchasing or preparation in the household. This confirms that, more females are involved in food purchasing and preparation; an observation consistent with the South African culture. The average age of respondents for the sample is 37.05 years with a minimum age of 18 years and a maximum age of 78 years. The average age suggests that beef products in South Africa are patronized by younger people.

The province has the smallest percentage and second smallest total number of white South Africans in the country. It also has the highest Black percentage out of all the provinces (Limpopo Province - An Overview". *dolimpopo.com*. Retrieved, 20 January 2017). With regard to marital status of the interviewed consumers, those that were single accounted for the highest percentage of the sample (47%), followed by married respondents (44%), while the divorced and widowed was the least represented category (8.6%). This implies that single and married people should be targeted consumers as they prefer already made and fast foods like fruit salads than married people. About 76.7% of consumers interviewed were African, while Whites and Coloureds were represented by less than 30%.

Most of the respondents had tertiary education (59.3%), about 30.7% of the respondents had high school education, while 6.0% had primary education, and 4.0% of the respondents had no formal education. This indicates that most of the consumers who specialize in the purchase of beef have attained tertiary education. This could be as a result of the fact that some form of education is needed to fit into the urban way of life. Also, this could be an opportunity for investments in beef front-pack label industry in Polokwane, since more educated consumers are likely to be more informed on beef quality standards. Moreover, they are aware of nutrition content and concerned with labelled and graded beef.

Table 4: Socioeconomic characteristics of consumers

Variable		Frequency	Percentage (%)
Gender	Male	55	36,7
	Female	95	63,3
Educational level	No formal education	6	4
	Primary school	9	6
	High school	46	30,7
	Tertiary education	89	59,3
Marital status	Single	71	47,3
	Married	66	44
	Divorced	2	1,3
	Widowed	11	7,3
Ethnicity	African	115	76,7
	Coloured	18	12
	White	17	11,3
Employment status	Employed	104	69,3
	Unemployed	46	30,7

Source: Author's survey data, 2017.

The results as shown in Table 4.1 below show that, the sample average household size is 5.28 members per household with a minimum of 1 member and a maximum of 12 members. South Africa remains a dual economy with one of the highest inequality rates in the world, perpetuating both inequality and exclusion (World Bank, 2017). The average household income per month is R14480.15 with a minimum of R0 and a maximum of R75000. This high variation in income levels shows the gap between the rich and poor. According to Statistics South Africa (2016), the Gini coefficient measuring relative wealth reached 0.65 in 2014 based on expenditure data (excluding taxes), and 0.69 based on income data (including salaries, wages, and social grants). The poorest of the South African population consume less than 3% of total expenditure, while the wealthiest consume 65%. This indicates disparity in South Africa as suggested by the study.

Table 4.1: Sample average

Variable	Mean	Standard Deviation
Age	37,05	11,562
Household size	5,28	2,317
Monthly income	14480,15	14557,47

Source: Author's survey data, 2017.

4.1.2. Consumers' behaviour

4.1.2.1. Awareness of beef grades

In the consumer survey the respondents were asked whether they had knowledge regarding the grading/classification systems of red meat and if they understood the grading/classification of meat as the form of coloured marks. Results show that slightly more than a half of beef consumers (53%) mostly being males, perceived knowledge of the classification system or marks on some cuts of the meat. This is attributed to the fact consumers interviewed purchases beef at supermarkets with potentially lower food safety and quality standards, and thus must rely on the use of classification marks on beef to reduce the risk of buying potentially unsafe meat. The results could also be attributed to the high literacy level of the respondents. Even though the results states that consumers are aware of the system, there is still a small increasing awareness

on grading systems as compared with the other countries. Respondents indicated the lack of availability of labels to show grades or classification, as a primary reason that they did not know or understand the classification or grading system.

The results of the awareness and how they heard about this awareness can be attributed to the influx of radio stations across the entire nation and the fact that most of these radio stations do health education programmes in the local dialect and also due to funerals and other social gatherings in the communities

4.1.2.2. Consumer preference with regards to quality beef

There is a continuing need to examine consumers' preferences for quality beef attributes to properly develop and use those characteristics as the industry attempts to provide consumers with easy and convenient meats. Bone and fat content in the meat, fat colour, meat colour and juiciness were beef quality attributes that consumers accounted as their most preferred attributes. Respondents (87%) showed a strong preference for beef with less fat, less bones, white fat, tender and slightly red meat. This is supported by Labuschagne *et al.* (2010) who found that SA consumer traditionally prefer beef that is tender. When asked to account for their choice of preferences, most consumers revealed that fat content was the most important underlying characteristics for beef quality. It is also perceived as indicators of beef tenderness and palatability, which increase utility derived from beef consumption. The bone content is important because respondents explained that they would want to maximise utility by paying for what they can eat. The remaining respondents (13%) preferred juiciness and appearance (red colour). While these are considered as important qualities in analysing preferences for beef consumers, they appear to be somewhat less important in this study.

Table 5: Consumer preference for quality beef

Beef attributes	% of consumers who prefer the attribute
Fat content and tenderness	49
Bone content	17
Fat colour	21
Lean colour	5
Beef juiciness	8

Source: Author's survey data, 2017.

To determine which food safety scares consumers are concerned about while procuring beef products these days, the respondents were requested to rate five given concerns. Figure 1, shows that animal disease is the most threatening issue for beef consumers, followed by Salmonella, hormones and fat or cholesterol. Consumers seem to be less affected by antibiotics used in the beef industry.

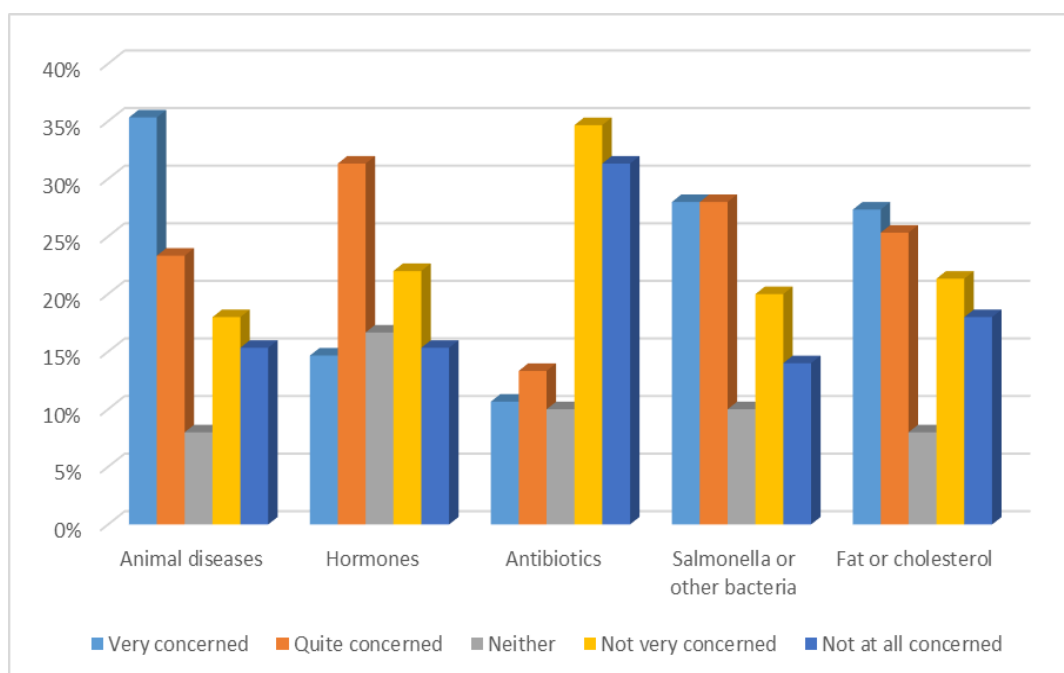


Figure 1: Consumers' safety concerns

It is understood by the respondents that the beef marketing chain can be risky, so 53% of the respondents want their beef to be free from physical objects as a sign of safety, followed by microbes (bacteria, E. coli, etc) 40% and lastly chemicals (pesticides, drugs, etc.) 7%. Overall, most of the respondents believed that the meat in the market place (grocery stores and butcheries) is safe for consumption and of great quality.

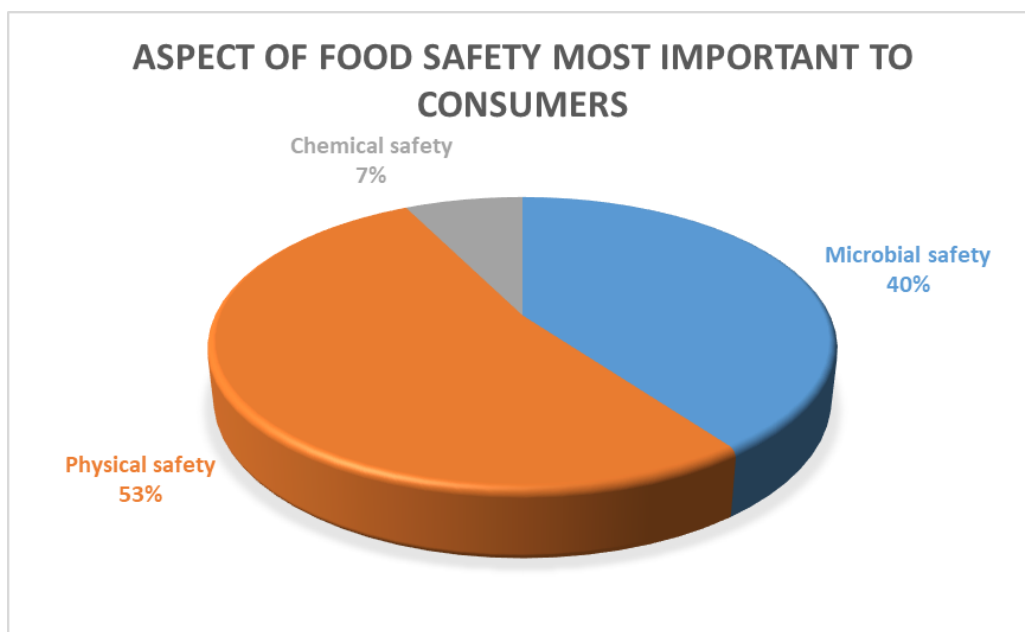


Figure 2: Aspects important in food safety

4.1.2.3. Purchasing behaviour of consumers

Beef remains as one of the food most preferred in our country, the findings indicate that most of the respondents (60.7%) purchase beef at a monthly basis, followed by 31.3% who purchase on a weekly basis. This could be attributed to higher prices of beef when compared to its substitutes. About 61.7% of the respondents mentioned the supermarket as their main place of purchase for beef (see Table 6) were the acquired product was packaged. The butchery was selected second, considering the possibility of being served at the counter, bulkiness and the trustworthiness of the butcher. The market share of butcher shops in SA has been decreasing and accounts for roughly 30% of all meat product sales. Lastly approximately 10% of all the respondents buy beef from local shops, hawkers and others self-produce.

Table 6: Purchasing behaviour

Frequency in beef purchasing	Frequency	Percentage (%)
Daily	12	8.0
Weekly	47	31.3
Monthly	91	60.7
Location for beef purchase		
Supermarket	92	61.7

Butchery	43	28.9
Street hawkers	11	7.4
Other	3	2.0

Reason for purchasing at location

Most convenient	66
Best value for money	86.6
Quality of the meat	83.3
I trust them to make sure the meat is safe for eating	83.3
The service is excellent	61.3
Availability	56.7
Nearness of beef source	38.7

Source: Author's survey data, 2017.

Price (86.6%) and convenience (66%) are some of the reasons why South African consumers have a habit of purchasing fresh meat in supermarkets, hypermarkets and small independent grocery stores, which are very accessible. Supermarkets are the most popular retail channel through which the majority of fresh meat in South Africa is sold and most consumers enjoy doing their household shopping in one retail outlet. Butcheries are also very popular for the purchase of meat in South Africa and this channel appeals mainly to consumers who prefer fresh meat over frozen meat and who value the expertise which only skilled butchers can offer such as the quality of the meat (83.3%) and making sure the meat is safe (83.3%).

Criteria influencing consumers' decisions when purchasing meat

Table 7: Variables influencing buying decisions

Variables	Frequency	Percentage
Price		
Neither	1	.7
Not very reliable	3	2.0
Reliable	5	3.3
Quite reliable	5	3.3
Highly reliable	136	90.7
Freshness		
Neither	1	0.7
Not very reliable	2	1.3
Reliable	5	3.3

Quite reliable	11	7.3
Highly reliable	131	87.3
Tenderness		
Neither	14	9.3
Not very reliable	10	6.7
Reliable	39	26.0
Quite reliable	37	24.7
Highly reliable	50	33.3
Meat colour		
Neither	10	6.7
Not very reliable	6	4.0
Reliable	10	6.7
Quite reliable	16	10.7
Highly reliable	108	72.0
Bone-to-fat ratio		
Neither	21	14.0
Not very reliable	27	18.0
Reliable	34	22.7
Quite reliable	42	28.0
Highly reliable	26	17.3
Organic certification		
Neither	30	20.0
Not very reliable	55	36.7
Reliable	43	28.7
Quite reliable	12	8.0
Highly reliable	10	6.7
Quality mark, quality seal		
Neither	14	9.3
Not very reliable	16	10.7
Reliable	34	22.7
Quite reliable	53	35.3
Highly reliable	33	22.0
Shopping environment		
Neither	-	0
Not very reliable	18	12.0
Reliable	82	54.7
Quite reliable	30	20.0
Highly reliable	20	13.3
Packaging		

Neither	2	1.3
Not very reliable	100	66.7
Reliable	8	5.3
Quite reliable	26	17.3
Highly reliable	14	9.3
Sell-by-date		
Neither	13	8.7
Not very reliable	6	4.0
Reliable	4	2.7
Quite reliable	13	8.7
Highly reliable	114	76.0

Source: Author's survey data, 2017.

Factors such as taste, packaging, price, size, colour, expiry date, and health benefits have been found to affect consumers' buying decisions. For example, Adepoju, and Oyewole (2013), found that taste, packaging, size, colour and price affected consumers' buying decisions for bread with cassava flour inclusion. Similarly, Scozzafava *et al.* (2013), reported that price affected the final decision in purchasing beef. In line with previous studies, Table 6 reveals that price (90.7%), freshness (87.3%), sell-by-date (76%) meat colour (72%) are the factors considered to be highly reliable in influencing the buying decisions of the respondents. However, of all the variables affecting the buying decisions of respondents, price appears to be the most important as about 136 respondents (90.7%) reported. Consumers are of the view that appearance or colour are somewhat important attributes considered when purchasing beef.

The least reliable variable affecting buying decisions of the respondents was found to be packaging followed by organic certification. This is in contradiction with Peters-Teixeira and Badrie, (2005) who reported that packaging and food labels have hence probably become the most important and most influential factor during consumer decision making. The contradiction may be attributed to the fact that consumers do not frequently check labels since beef products in some SA meat markets are partially labelled.

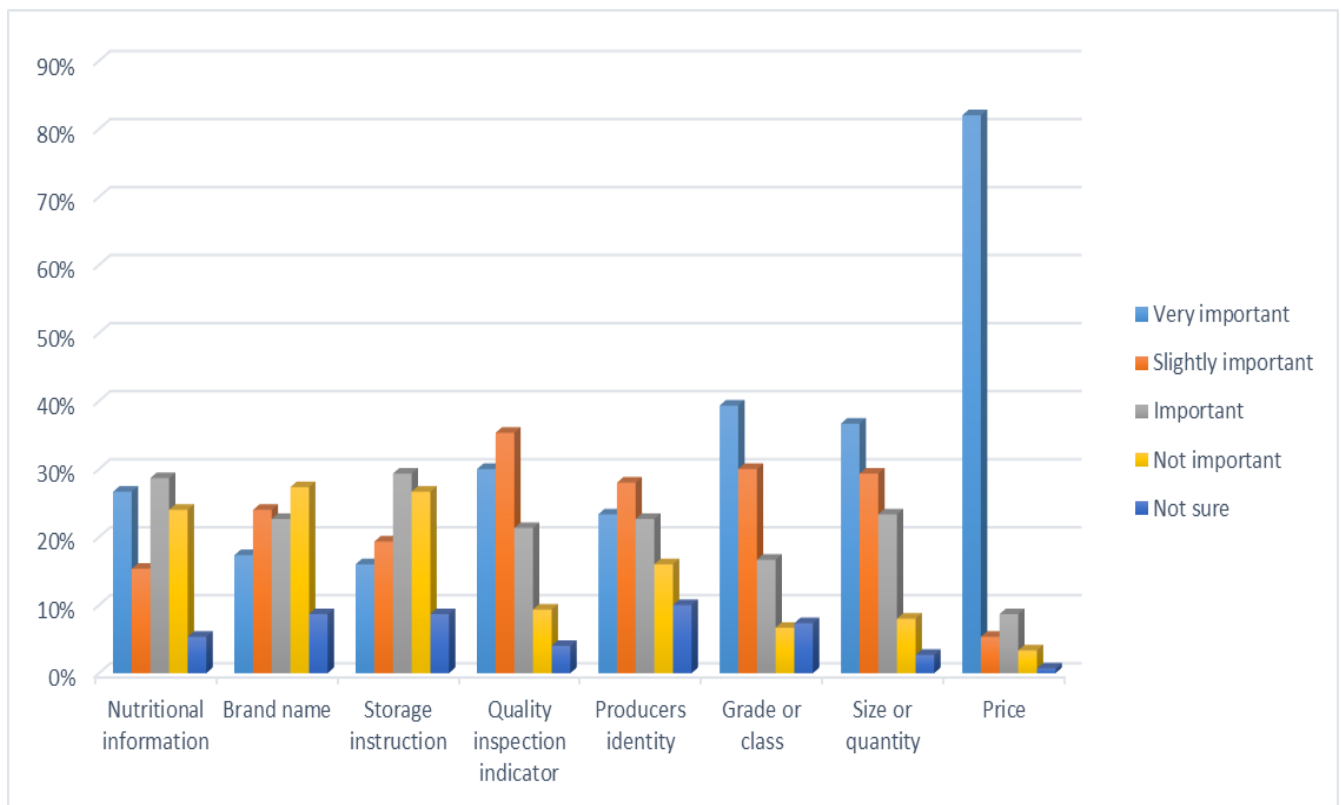


Figure 3: Importance of information on beef labels

A label is printed material that is either printed on the packaging itself, or attached to a product's container (Regulations relating to the labelling and advertising of foodstuffs, 2010). Some labels are attached to the food packaging (e.g. bottles or boxes) while others are more elaborate, purposely designed graphic material that become an integral part of the package (Prinsloo *et al.*, 2012). The role of labelling has become rather important as it is used as an efficient marketing tool to attract consumers, and serves as a functional sipping container for goods. Quality labels are a way of communicating product quality to the consumers; which help consumers to choose products that meet their needs and the specified standards. In addition, quality labels guarantee the product quality and its origin.

The government has developed mandatory food standards with a section on labelling of the product which include information on the name of product, the name and address of the manufacturer, country of origin, date of product manufacture, the expiry date, the batch number, ingredients, storage conditions, net weight where number or volume of contents are in metric units and the indication of genetically modified products (Regulations relating to the labelling and advertising of foodstuffs, 2010). In

SA, very few packaged beef in the retail outlets are labelled but do not display complete information about classification. The available labels on the beef only display information on price, net weight and expiry date but they do not show nutritional content, quality inspection or name of manufacturer.

As shown in Figure 2 the importance of information available on the beef package was ranked by consumers as follows: price, grade or class and size/quantity of the product were the most important labels followed by quality inspection or certification indicator. These findings are consistent with those of Peters-Teixeira and Badrie, (2005) and Prinsloo *et al.* (2012), who found that consumers had higher interest of nutritional information on food packages. Slightly lower attention was given to nutritional information and brand name. Producer's identity was found to be the last information in which consumers were interested. These results show that beef front-pack labels in SA should include nutritional information, storage instruction, quality inspection, price, size and grade or class.

4.2. Willingness to pay for graded beef

The distribution of respondents willing to pay for graded beef is shown in Table 8. Of all consumers, 64.67% were willing to do so and the remaining 35.33% were not willing to pay anything.

Table 8: Distribution of consumer WTP

WTP	Frequency	Percentage
Willing to pay	97	64.67
Not willing to pay	53	35.33
Total	150	100

Source: Authors' computation from survey data

Initially the respondents were asked if they would pay more for beef. Respondents who accepted were additionally asked if they would be willing to pay for graded beef at a higher price. The actual or base price of beef was R42.20/kg.

Table 9: Consumer response to different bid levels

		Response (%)					
Bid	WTP	5% bid	10% bid	15% bid	20% bid	25% bid	
Premium	Yes	68.0	65.6	79.7	51.5	56.7	
	No	32.0	34.4	11.3	48.5	44.3	
Discount	Yes	33.3	54.5	80.0	80.3	100.0	
	No	66.7	45.5	20.0	19.7	0.0	

Source: Author's computation from survey data, 2017

The bid sets were randomly distributed to the questionnaire. These initial and second bids were obtained during the pilot survey. Over half of the respondents would be willing to pay more although the proportion diminished with the level of the extra cost. Respondents given a 5% premium, only 68% were willing to pay. For respondents given a 10% premium, only 56.7% were willing to pay. This is consistent with economic theory because the amount of the respondents willing to pay decreased as the bid they were asked to pay increased.

Respondents who rejected the initial bid (35.3%) were presented with a lower bid (discount), also at different percentage to the actual price of beef. Respondents presented with a discount of 5%, 33.3% were willing to pay. One hundred percent (100%) of respondents with a 25% discount accepted the bid.

To evaluate the mean WTP empirically, the logit model explaining WTP without consumer characteristics ($\lambda_i = 0$) was estimated (Jerop, 2012). Table 10, shows estimated mean WTP for the graded beef considered in the study.

Table 10. Estimates for the double bounded dichotomous choice model

Variable	Estimate	Standard error
Constant (α)	4.0258	0.4355***
Bid (ρ)	0.0822	0.0786***
Mean WTP (α/ρ)	48.97	

Number of observations	150
Log-likelihood	102.611
Chi squared	15.125
Pseudo R ²	0.666

***Statistically significant at 1%

Source: Author's computation from survey data, 2017

Following equation 7, the mean WTP can be derived from the α/ρ ratio, where, where α is the coefficient of the intercept term and ρ is the coefficient of the bid. Therefore, mean WTP = α/ρ = R48.97/kg. The positive mean WTP for graded beef is expected, given studies in other countries (Chung *et al.*, 2012). Results show that consumers would be willing to pay an increase of 16.04% for graded beef, as opposed to normal beef with no differentiation. It is important for all the stakeholders in the beef industry to consider this attribute as a tool for differentiation. This is supported by Berges *et al.* (2015), who found out that the mean WTP for purchasing certified beef with the presence of "safety certification" label, was approximately 20% higher than the current price. Sriwaranun *et al.* (2013), indicated that respondents were willing to pay a premium price of 88% for organic products. Lewis *et al.* (2017), also found that consumers were willing to pay more for safety attributes in Germany.

4.3. The effects of socioeconomic characteristics on WTP

To analyse the effects of different characteristics on WTP, equation 8 was estimated. The model included a total of 10 variables and only four were found to significantly influence WTP.

Table 11: Logit results of socioeconomic factors influencing consumer WTP

Variable description	Coefficient	Standard error	Marginal effects
Constant	3.2958	0.2873	-
Gender	1.222	0.0016***	0.0131
Income	0.087	0.050**	0.0229

Age	-0.139	0.065*	-0.004
Education	0.106	0.557	0.0157
Household size	-0.231	0.069*	-0.0143
Ethnicity	0.429	0.109	0.0191
Marital status	-0.216	0.527	-0.104
Employment	0.033	0.061	0.0175
Frequency of purchase	0.035	0.138	0.003
Awareness of beef grades	0.137	0.167	0.059
<hr/>			
Number of observations	150		
Log-likelihood	98.224		
Chi squared	20.095		
Pseudo R ²	0.578		

Note * **and ***; Significant at 10%, 5% and 1% respectively.

Source: Author's computation from survey data, 2017

The purpose of estimating the logit model with the addition of consumers' characteristics was to determine relevant characteristics which influence consumers' WTP. The marginal effects of the variables were also estimated, the model further shown that the probability of WTP for graded beef was positively influenced by gender and income. Conversely, WTP was negatively affected by age, household size and marital status.

The results in Table 11 reveal that, the gender of the respondents had an expected positive and significant effect on the WTP for graded beef at 1%. This means that female would pay more for graded than males. The results indicate that, female consumers who are responsible for buying groceries and cooking for the entire household would be willing to give out more of their income to keep the household healthy. The marginal effect of 0.013 implies that each additional year of age from the mean increases the probability of the respondent to pay more for graded beef is 1.3%.

The positive sign was expected and significant at 1% indicating that female consumers are likely to pay high premiums than male consumers.

The coefficient of income showed significance at 5% and had a positive sign, implying that consumers were willing to pay more as their income increased. This finding agrees with Alinda *et al.* (2016), who reported that income influenced the WTP for quality beef. The marginal effect indicates that having higher income levels increases WTP by 2.3%. Beef is a highly valuable food item for which the market price remains relatively higher compared to other foods. Willingness to prioritise expenditure on beef will therefore increase with increase in income. At 5% significance level, the data provides sufficient evidence to conclude that consumers are willing to pay for graded beef and that socioeconomic characteristics do influence consumers' WTP for graded beef. Therefore, null hypothesis were rejected.

Results shows an unexpected negative sign on the coefficient of age and a significant effect of 10%. A one-year increase from the mean reduces the probability of the respondent's WTP by 0.4%. This indicates that, older respondents are not willing to pay for graded beef when compared to younger consumers. The results indicate that, the youth who still have more years to live, for all things being equal are likely to be cautious of the quality and safety of the food they consume as opposed to the aged who have lived their youthful age without concern to the safe measures to what they consume. This is supported by Owusu-sekyere (2014), who indicated that consumer characteristics such as age and income significantly influenced preferences and WTP for beef products.

The coefficient for household size variable was negative and shows a significant effect of 10% on WTP for quality beef. The finding implies that an additional member in the household reduces the probability of respondents WTP by 4.3%. This means that there is a negative correlation among household size and WTP. The higher the household size, the less likely the WTP more for graded beef. The reason might be that, in larger households the disposable income per person decreases, therefore less willing to pay more. This finding differs from a study by Radman *et al.* (2012), who found that household size was the most vital and significant factor that influenced and determined the WTP.

Estimated coefficient for education was positive. The marginal effect indicated that for each additional increment in educational level, the probability of the willingness of the respondent to pay for graded would rise by 1.6%. This could be because education raises awareness on food safety and quality and that educated respondents are concerned about health.

The ethnic background of the respondents (ethnicity) influences WTP for graded beef but it is not significant. Frequency of purchase increased the probability of WTP by 0.3%. Result also revealed that an increase in the level of awareness of respondent on the grading system, the higher the probability (5.6%) of their WTP more for graded beef. Therefore, the information given about grading systems was able to affect the actual liking of beef. This in contrast with Jerop (2012), who found that awareness decreased the probability of consumers to pay for goat milk.

The marital status of the respondents was found to have a negative sign. The finding implies that were not willing to pay for graded beef as opposed to those who were single or divorced/separated. This could be explained by the fact that married respondents are likely to live in households which have more economic obligations (i.e. children) than those with single or divorced/separated households

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter draws a summary of the research findings and conclusions based on results of the study. Furthermore, recommendations are brought forward on how best to satisfy the beef consumer as well as improve the beef market based on the needs of the consumers.

5.1. Summary

Improved knowledge about the connection between diet and health, combined with rising standards of living, heightened awareness of food-related safety issues and consumer expectations have led to growing demands on the food production system throughout the world. In general, consumers have become more interested in where their food comes from and how it is produced, while the food industry has recognized the potential for product differentiation opportunities and management. This has led to establishment of quality standards in food products, including beef. The Red Meat industry has made a number of efforts to guarantee the safety and quality of beef. This includes the creation of South African Meat Industry Company (SAMIC) as a quality assurance company to ensure the quality and safety of meat in South Africa.

This study aims to find the consumers' preference and WTP for graded beef. In eliciting the required information, face-to-face surveys with double bounded contingent valuation setting was employed on 150 respondents. The econometric analysis was conducted by using double bounded logit model in SPSS 23.2. The surveys were conducted with randomly selected people in different parts of Polokwane municipality in order to represent all consumer groups.

First of all, socio-demographic characteristics of the respondents are explained along with the descriptive variables. Awareness about the grading or classification system, preference of beef quality and the purchasing habits are explained. Then, the independent variables are used intuitively in the model in order to find the WTP for a group of variables and lastly variables are used to find the influence of socio-economic characteristics on the WTP.

About 53% of the respondents were aware of grading or classification systems and their major source of information was through the butcher's information. Consumers purchase decisions were influenced by price (90.7%), freshness (87.3%), sell-by-date

(76%) and meat colour (72%). While most consumers (65.4%) preferred buying from supermarkets, 28.9% preferred buying from the butchery and others (9.4%) at the street vendors. The study also revealed that consumers prefer beef products to be labelled with price, grade/class, size or quantity of the product and lastly quality inspection or certification indicator.

With the ever-growing dominance of supermarkets in beef markets consumers now prefer to buy beef, in the supermarkets, mainly for convenience and price. Those who purchase at the butchery do so because they trust the butcher and because of the quality of the products.

Quality is to some extent subjective and preferences vary, however, consumers primarily use intrinsic and extrinsic quality cues to assess the quality of food. The intrinsic quality cue appearance, strongly affected the assessment of fresh meat. The results of the analysis of this study showed that respondents strongly preferred beef that was with less fat, less bones, contained white fat and had slightly red colour.

Consumer WTP for graded beef was also assessed using the contingent valuation method. The results showed that the respondents' WTP more for graded beef was more than 16% of the prices of the normal beef without any grading or classification. The empirical results also show that the bid price significantly influence consumers' WTP for graded beef. Also, product characteristics such as colour, size, tenderness, freshness statistically influence consumers' WTP for graded beef.

The logit model was used to estimate the direct effects of socio-economic on their individual WTP. The results revealed that, gender coefficient was found to be positive as expected and statically significant at 1% indicating that female consumers are likely to pay high premiums than male consumers.

The expected positive signs of income coefficients which was statistically significant at 5% on consumers' WTP indicates that, high income earners were likely to be willing to pay high for graded beef which will be shown on front of pack label than lower income earners. Age of respondents and household size were significant at 10% on consumer WTP indicate. Age had an unexpected negative sign on the coefficient which indicates that, elderly consumers are not willing to pay for graded beef as opposed to younger consumers. Also, household size had a negative sign on the coefficient, which explains that the higher the household size, the less likely the WTP

more for graded beef. Marginal effects of the estimated variables revealed that awareness had a strong impact on WTP and that an increase in awareness of the grading system increased the probability of WTP by 5.9%.

5.2. Conclusions

The results led to the conclusion that most consumers are not aware of the grading system, however show interest in food safety and quality. Therefore, investments in educating consumers about these systems would be vital. The emphasis should be put in supermarkets and butchereries since those places are frequented by higher educated and higher income earners who are willing to pay premium for high quality and graded beef.

The findings reveal that consumers prefer less fat, less bones, white fat and slightly red colour meat. Also, they prefer beef products to be labelled with price, grade/class, size or quantity of the product and lastly quality inspection or certification indicator. Over half of the respondents (53%) were aware of grading or classification systems and their major source of information was through the butcher's information. Small-scale producers and processors should consider these attributes to implement differentiation to stimulate further demand. This shows an opportunity in marketing, beef producers can substantially increase the values of their animals by improving fat content, lean colour and fat colour through feeding and breeding management systems.

WTP for graded beef varies significantly across age, gender, income of respondents and household size of beef consumers. Polokwane producers can use the study results to target market their local beef products to consumers who are most likely to be willing to pay a premium. Producers can target market their beef to make it more accessible and appealing to those that are more likely to choose graded beef.

5.3. Contributions to knowledge

This study adds to the current body of literature on food quality and safety. The study provides empirical evidence on importance given to quality labels including grades, nutritional content as well as quality certification on the front-pack of beef. Inclusion of these attributes give the information on most preferred attributes in beef and shows the empirical estimation of economic value that consumers give to those quality attributes in South Africa.

5.4. Policy recommendations

Implications from the study extend to three levels explicitly: farming, meat sector and government. Subjects deal with quality and marketing issues. Firstly, at farm level, it was indicated that challenges to be met deal with increasing production efficiency and producing quality and intrinsically safe meat through animal welfare and environment friendly production methods. For future growth of production, farmers need to practise stringent production practises, controls and standards as set by the government and meat sector.

Secondly, at the meat sector, changes in consumer needs and demands for safety and quality guarantees are major constrains. For competitive advantage, role players need to produce beef that is healthy, of good quality and convenient for consumers. Restoring the image of meat and providing consumers with assurance are also recognized as priorities. The information produced by respondents led to the recommendation that a grading or classification scheme could achieve the objective of promoting marketing of beef by using the marking or labelling of quality marks (grading information) on beef up to the point of retail, this can satisfy consumer choices with different levels of WTP. Grading with respect to quality attributes would therefore make beef sales at differentiated prices possible. Ultimately, it would enhance sales volumes and returns for beef producers, processors and traders in the value chain. Graded beef could also facilitate the development of beef exports.

Thirdly, the government has a role of protecting consumers through providing education related to potential health risks and benefits and establishing clear rules and regulations to benefit all role players in the meat chain. Investment in creating awareness through media (television, radio, newspaper etc.), about grading schemes is recommended, to display the different grades of the beef, highlight risks associated with eating unsafe beef, the importance of different vitamins to the body and the importance of graded beef. This will help reduce the death rates caused by unknowingly eating unsafe food. The results show that the information given about grading systems is able to affect the actual liking of beef

The meat sector should also use selective targeting of socioeconomic characteristics to develop a strong market for quality characteristics and food safety of beef products. Among socioeconomic characteristics, age, gender, income and household size

significantly influence WTP. Elderly respondents were not willing to pay for graded beef when associated to younger consumers, and those with higher level of income per month and few members in the household have higher WTP than those with little income and bigger household size. All Polokwane municipality consumers are a great target market for this campaign however, it is important to reach out to the young consumers, females and high-income earners because they showed positive WTP for graded beef. It is therefore recommended that investors use selective targeting of socioeconomic characteristics to develop a strong market for quality characteristics and food safety of beef products. As shown in the results, when income increases the respondents were willing to pay more for graded beef.

5.5. Suggestions for future research

Future research should focus on the following areas:

- The study only focused on Polokwane municipality, Limpopo and is therefore not applicable to a broader audience. There is still a considerable need for empirical studies of WTP for graded beef on a provincial if not national scale. This knowledge will support the notion that visible on pack labelling indicating the grading of meat, could empower consumers to make more informed product decisions.
- Given the experience of this survey, some methodological improvements can be suggested for future studies.
- Concerns about high quality, health, and social-responsibility demand will make product attribute labelling an important marketing tool for the future. As food products with unobservable quality attributes are increasingly marketed, the information issues and their implications for food supply chains, markets, and trade will continue to gain importance. More research is needed to understand these markets and information issues and evaluate policies.
- Future research should also include WTP for other attributes of beef such as animal welfare, product characteristics, environmental and health concerns.

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7. APPENDICES

Appendix A: PARTICIPANT CONSENT LETTER

Department of Agricultural Economics
and Animal Production

University of Limpopo

Private X1106

Sovenga

0727

Date: _____

Dear participant

Thank you for agreeing to take part in this study focusing on consumers' preference and willingness to pay for graded beef in Polokwane municipality. The purpose of the study is to evaluate consumers' preference regarding safe and quality beef and determine willingness to pay for graded beef in Polokwane Local Municipality.

Kindly answer all questions as honest as you can. Your responses will remain strictly confidential. You are free to answer any question. Participation is voluntary, and you are therefore free to withdraw from this study at any time. Thank you for your cooperation.

Kind regards,

Miss L.F Makweya (master's student)

Date

Prof I.B Oluwatayo (supervisor)

Date

Appendix B: PARTICIPANT CONSENT FORM

I _____ hereby agree to participate in a master's study focusing on consumers' preference and willingness to pay for graded beef in Polokwane local municipality, Capricorn district, Limpopo province, South Africa.

The purpose of the study was fully explained to me and I understand that my participation in this study is voluntary and that I am not forced to participate. Furthermore, I understand that I can withdraw from participating in this study at any time. I also understand that my responses will be kept strictly confidential.

I insist that this research project is not necessarily going to benefit me personally.

Signature: _____

Date: _____

Appendix C: REQUEST FOR PERMISSION

P O Box 7018
Mmotong
0784

The
Polokwane
PO
Polokwane
0700

Executive

Local
Box

Mayor

Councillor
Municipality
111

Dear Ms., Thembi Nkadimeng

REQUEST FOR PERMISSION TO COLLECT DATA.

My name is Lesiba Florah Makweya, a student in the Department of Agricultural Economics and Animal Production at the University of Limpopo. I am currently undertaking a research project for my master's degree. My interest lies in exploring consumers' preference and willingness to pay for graded beef in Polokwane local municipality. To this end, I kindly request permission to collect data from beef consumers at Polokwane local municipality.

Should you have any queries or comments regarding this survey, you are welcome to contact my supervisor at (015) 268 3928 or 078 4493 162 isaac.oluwatayo@ul.ac.za

Yours sincerely,

Appendix D: ETHICAL CLEARANCE APPROVAL



University of Limpopo
Department of Research Administration and Development
Private Bag X1106, Sovenga, 0727, South Africa
Tel: (015) 268 3935, Fax: (015) 268 2306, Email: anastasia.ngobe@ul.ac.za


TURFLOOP RESEARCH ETHICS COMMITTEE CLEARANCE CERTIFICATE

MEETING: 27 November 2018

PROJECT NUMBER: TREC/211/2018: PG

PROJECT:

Title: Consumers' preference and willingness to pay for graded beef in Polokwane municipality, South Africa.
Researcher: LF Makweya
Supervisor: Prof IB Oluwatayo
Co-Supervisor/s: N/A
School: Agricultural and Environmental Sciences
Degree: Master of Science in Agricultural Economics



PROF T. MASHEGO

CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE

The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: REC-0310111-031

Note:

- i) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.
- ii) The budget for the research will be considered separately from the protocol. PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

**CONSUMERS' PREFERENCE AND WILLINGNESS TO PAY FOR GRADED BEEF
IN POLOKWANE MUNICIPALITY, SOUTH AFRICA.**

Questionnaire no:



School of Agriculture and Environmental Sciences

Department of Agricultural Economics and Animal Production

BEEF CONSUMER SURVEY QUESTIONNAIRE

The questionnaire is three parts:

Section A consists of questions on the socio-demographic characteristics of the interviewee.

Section B consists of questions on beef

Section C consists of questions on consumers' willingness to pay.

SECTION A: Characteristics of the beef consumer

Please tick

1. Gender

Male	Female
<input type="checkbox"/>	<input type="checkbox"/>

2. Age.....

3. Educational level

No formal education	Primary school	High school	Tertiary education

4. Ethnicity

African	Coloured	White	Asian

5. Marital status

Single	Married	Divorced	Widowed

6. Household size.....

7. Employment

Employed	Unemployed

8. Monthly income.....

	Yes	No
9. Any other source of income		
10. Access to social grant		
11. Access to credit facility		
12. Membership of association		

SECTION B: Beef Consumption

1. Where do you normally buy beef?

Supermarket (packaged)	Butchery	Street hawkers	Other

2. Reason for purchasing at that location	Yes	No
Most convenient		
Best value for money		
Quality of the meat		
I trust them to make sure the meat is safe for eating		
The service is excellent		
Availability		
Nearness of beef source		

3. How frequently do you purchase beef?

Daily	Weekly	Monthly

4.

	Yes	No
Are you familiar with the concept of meat grading?		
Do you understand the classification (coloured marks/labels) on some cuts of your meat?		

**5. What characteristics do you rely on when looking for a quality beef product?
(average scores from five-point scale, with 5 indicating highly reliable)**

Price	
Freshness	
Tenderness	
Meat colour	
Bone to fat ratio	

Organic certification	
Quality mark, quality seal	
Shopping environment	
Packaging	
Sell-by date	

6. What are the factors you consider before buying for beef?

.....

7. Which aspect of food safety is more important to you?

Chemical safety (use of car tyres in singeing, improper washing of the offal, additives, etc.)	
Microbial safety (bacterial infections, careless display location , presence of blood)	
Physical safety (presence of foreign material in the product)	

8. Rate the following

Beef concerns	1= not at all concerned	2= not very concerned	3= neither	4= quite concerned	5= very concerned
Animal diseases					
Hormones					
Antibiotics					
Salmonella or other bacteria					
Fat or cholesterol					

9. How important are these aspects to you in meat package label?

Label aspect	1 = Not sure	2 = Not important	3 = Important	4 = Slightly important	5 = Very important
Nutritional information					

Brand name					
Storage instruction					
Quality inspection indicator					
Producers identity					
Grade or class					
Size or quantity					
Price					

10. Which information about beef do you wish should appear on the packaging?

.....

11. Who do you trust most when looking for information about the safety of the meat? Name a few

.....

.....

SECTION C: Contingent Valuation

Imagine in a usual shopping incidence, you see two choices of fresh beef in the meat section: the one has no labelling and the other is differentiated by a label with meat quality grades on it.

Suppose that the industrially produced beef is priced as R 42.20 per kilo.

Are you willing to pay more for graded beef?

Yes No

(For question 1 and 2 obtain the correct percentage and ask in terms of Rands).

1. If yes, are you willing to buy graded beef if it was offered at a price of.....10%.....20%.....30%.....40%..... 50%?

Premium?

2. if No, would you be willing to buy graded beef if it was offered at a price of:
10%.....20%.....30%.....40.....50%?

Discount (tick the minimum price)?