The impact of secondary information on consumers' willingness to pay for differentiated fresh lamb meat products in South Africa

by

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Declaration

I, Tineil Hurter, declare that this dissertation, which I hereby submit for the degree MSc (Agric) Agricultural Economics at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

Signature: July 2018

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When I decided to embark on this journey, I had no idea of what was waiting for me. I started the next chapter of my academic career, with determination and a plan. I was prepared for the expected trials and challenges which I was told came with the decision and responsibility of such a *masterful* journey. Despite this cognitive self-confidence, I was not prepared for the strong currents, hurricane winds and rogue waves which life was about to slide my way – the beginning of my own magnificent, perfect storm.

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From Pretoria to Bloemfontein. Amsterdam in the Netherlands and Queenstown in the Eastern Cape. This dissertation has taken me on an incredible journey. I am looking at the horizon for the next beginning.

"…At just the right time we will reap a harvest of blessing if we don't give up."

Galatians 6:9

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Abstract

The typical South African red meat consumer is spoilt for choice when it comes to the selection of their Saturday braai staples – chops, steak and "boerewors". Labels (primary information) claiming the meat is Free-Range, Natural, Region-of-Origin or simply a Generic product might cause some uncertainty when all that a consumer wants is a good-looking T-bone.

The 2017/18 outbreak of *listeriosis* in South Africa, along with the previous meat scandals of undeclared meat-based ingredients, is undeniably a significant cause of concern to South African meat producers and consumers. The absence of or incomplete product information in the agricultural and food markets have consumers asking more questions about what is in their meat. This gap in information about the effect of secondary information as a supplement to the labelled (primary source) information became the premise for this study. The effect of information on consumers' demand has been studied across the globe. On the other hand, little research has been done in a South African context, which only focuses on the effect of positive secondary information on consumers' purchasing

decisions and ultimately their willingness to pay (WTP) for fresh meat's quality cues and attributes.

This study is concerned with examining if and how positive secondary information about differentiated fresh lamb meat products will have an impact on consumers' willingness to pay. The WTP was elicited through an experimental auction, and the results could potentially be used to help realign the marketing approaches of the industry.

The analysis is based on 51 respondents participating in a two-stage experimental auction, three months apart. A random n^{th}-price auction was used to obtain the willingness to pay estimates. During the first stage, a pre-auction survey was done to define the exact demographic structure of the samples as well as gaining an understanding of the sample's purchasing and consumption behaviour. The first auction sets measured the initial willingness to pay (based on prior knowledge and beliefs) and the immediate effect of positive secondary information on the consumers' willingness to pay. In the second stage (3 months after the first auction), the willingness to pay values were re-elicited for the same group of participants and products, but this time without providing any positive secondary information. The second stage was conducted to determine the long-term effect of positive secondary information on the participants' willingness to pay.

The results from the experimental auction showed that the provision of positive secondary information is useful and has a positive effect on the consumers' willingness to pay Free-Range, Natural and Region-of-Origin fresh lamb meat products. In the long-term, the average willingness to pay bids increased after the positive secondary information was presented to the participants.

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List of Abbreviations

BDM	Becker-DeGroot-Marschak auction mechanism
DAFF	Department of Agriculture, Forestry and Fisheries
EA	Experimental Auction
ELM	Elaboration Likelihood Model
GM	Genetically Modified
LSM	Living Standards Measure
NWOM	Negative Word of Mouth
PWOM	Positive Word of Mouth
SAARF	South African Audience Research Foundation
SAMIC	South African Meat Industry Company
WOM	Word Of Mouth
WTP	Willingness to Pay

Chapter One

Introduction

1.1 Background

Following the cross-species contamination scandal in 2013 and the *Listeriosis* scandal in 2018, South African consumers are more attentive to what is in and should be in their meat products. This creates the need for more thorough information about the origin and production processes of the meat products being considered for purchase.

Product information in the agricultural and food markets is often incomplete, not readily available, distributed asymmetrically and has high transaction costs related to the collection thereof. Verbeke (2005), states that when consumers are faced with uncertainty with respect to food quality, it inhibits their efforts to harmonise their food choices with their preferences. Verbeke continues to explain that the only solution for this market failure, stemming from information asymmetry, is the provision of specific need-related information, which can be processed by the consumer. Market failure refers to the inability of the market to, in this case, match consumer choices with their preferences to buy the best and most appropriate product (Bator, 1958).

The other side of the coin is the assumption pertaining to the consumers' willingness and capability to process information. In 2004, McCluskey and Swinnen introduced the "rationally ignorant consumer" hypothesis. They postulated that a rational consumer may be imperfectly informed due to the fact that the marginal benefit of the information is not worth the high cost of obtaining or processing this information. When consumers purchase products, they usually do it with incomplete information about the product as well as the available alternatives on the market. Although, rational consumers will for example not intentionally consume hazardous food, without reliable information consumers face uncertainty and will need to incur search costs. When confronted with uncertain decision-making, consumers tend to act contrary to what is expected (Kahneman & Tversky, 1973).

This, for example, could happen when consumers have less knowledge or information than producers do, about production processes linked to quality indication labels on meat packaging. The effect of incomplete information on the decision-making process is, therefore, an essential aspect of consumer behaviour analysis (Tellis & Gaeth, 1990).

Environmental and consumer interest groups on the one side of the debate and agribusinesses and agro-food technology firms on the other, often present consumers with inconsistent information which translates into further confusion when consumers are faced with the purchasing decision. For example, the debate about the use of antibiotics and growth hormones in the production of food animals, and its possible effects on humans. The conflicting information problem can be explained by an example of growth hormones and antibiotics being used in meat production in South Africa.

Regardless of these conflicting information sources, the majority of South Africans continue to be frequent consumers of red meat. The fact, however, remains that consumers are faced with numerous decisions concerning food choices as part of their daily lives. Du Plessis and Du Rand (2012), explains that there are various stages in the decision-making process through which consumers go to make a final decision. To have reached the ultimate point of purchase, the consumer had to recognise a problem, search for, process information, and evaluate the alternative products available. Only when a problem is identified, a need for decision-making exists. If a consumer intends to purchase lamb or mutton but is uncertain about the quality, a need to resolve the situation arises. Prior to the actual purchase, the consumer will go through two search processes: internal and external. The internal process commences when the consumer recalls information from their memory. An example of this process would be when the term “Free-Range” brings up images of animals roaming free on endless green pastures, and thoughts of quality, tender and tasty meat. The information stored in the consumers’ memory is based on a source of experiences. For this information to be recalled from the consumers’ memory, product information needs to be available and accessible. If the consumer cooked a certain type of lamb before and found the meat to be tasty and tender, this memorable experience will assist the consumer in future decision-making processes (Du Plessis & Du Rand, 2012). The external search process will follow when the information from the consumer’s memory

is perceived to be unsatisfactory to make a purchase decision. When searching for information in the external process, consumers generally use meat colour and fat content as indicators of taste and tenderness, and animal welfare information as an indicator of health and wholesomeness (Grunert, 2005). Grunert continues to explain that consumers believe that information about the animal's breed, age, and slaughtering date are foretelling of meat taste and tenderness, but few consumers are confident in using this information in their decision-making. From this, it is apparent that it is particularly challenging to manage information because consumers and their individual needs for information differ. Consumers assume quality from certain product characteristics and information available for processing. This information can be discovered objectively through inspecting the physical product or subjectively through consumption. Grunert (2005) states that brands, labels, and information pertaining to the origin of the product are the three quality signals that receive considerable attention from consumers during the external search process.

1.2 Problem statement

Do South African meat consumers know what the labels (such as Free-Range, Region-of-Origin, grain-fed, grass-fed and certified Natural) on packets of meat are telling them? The terminology and concepts used on labels (primary information) have been studied and found to have significant meaning to consumers (Lusk, Jamal, Kurlander, Roucan & Taulman, 2005). When additional (secondary) information about ingredients or production processes accompany labels, there is also a noteworthy impact on consumers' purchasing decisions (Liaukonyte, Streletskaya, Kaiser & Rickard, 2013; Rousu, Huffman, Shogren & Tegen, 2007; Fox, Hayes & Shogren, 2002; and Hayes, Fox & Shogren, 2002).

Following an international cross-species contamination scandal in 2013, consumers are more attentive to what is and should be in meat products. Soon after, South Africa had its own scandal where undeclared ingredients were found to be present in meat products (Cawthorn, Steinman & Hoffman 2013). On the back of this, modern South African consumers require more thorough information on the composition, origin and safety of the

foods as they become more attentive of what they consume (Cawthorn, Steinman & Hoffman 2013). The extent to which this information actually adds value to the consumers' decision-making process can be better understood by measuring their willingness to pay (WTP) for a particular meat product.

Information is a key aspect, which motivates consumers to participate in the decision-making process to purchase fresh lamb meat products. The shortage of information could be adversely affecting consumers' decision-making process to purchase differentiated fresh lamb meat products. The biggest identifiable gap in South African case studies and literature is that there are no studies indicating whether positive secondary information has an impact on consumers' WTP for fresh lamb meat products. We do not know whether positive secondary information combined with a time factor will have a long-term effect on the WTP, which means we ultimately cannot conclude whether or not positive secondary information has a purpose or if it influences the decision-making process. This, in turn, suggests that South African food producers, processors and marketers cannot successfully develop, revise or improve strategies to complement the consumers' WTP for differentiated fresh lamb meat products.

The rationale for researching the effect of positive secondary information on SA consumers' WTP in this study is to evaluate if the use of positive secondary information, its immediate and long-term effect is of any value to marketers, producers and consumers alike. With significant results, positive secondary information could be used as a powerful marketing tool to gain consumer trust and loyalty.

All of the cases mentioned earlier and a large number of international studies within literature (Huffman, Shogren, Rousu & Tegene, 2003; Liaukonyte et al., 2013; Liaukonyte, Streletskaya & Kaiser, 2015; Loureiro & Umberger, 2007; Napolitano, Braghieri, Piasentier, Favotto, Naspetti, & Zanoli, 2010) studied the effect or impact of secondary information on consumers' WTP. Within the South African milieu, there has not been a study, which investigated the effect of only positive secondary information on consumers' WTP, let alone the effects of both positive and negative secondary information. The proposed study will aim to contribute to the literature, by minimising this knowledge gap by investigating

the effect of positive secondary information on South African consumers' WTP for differentiated fresh lamb meat products. Furthermore, the proposed consumer research and WTP experiments aim to establish whether consumers trust the available information to the extent that they apply it to their decision-making processes when purchasing fresh differentiated lamb meat products.

1.3 Conceptual framework

The South African lamb industry is characterised by a significant range of differentiated products and inherently different information. This information is usually observed on the labels of these products and is specifically designed to provide positive cues or incentives to encourage the decision-making processes of consumers. The effect, which this has on information and on the consumer, can be better understood through evaluating their WTP. Figure 1.1 below serves to illustrate how this information translates to consumer WTP for differentiated fresh lamb meat products to ultimately make recommendations about the best strategies to use.

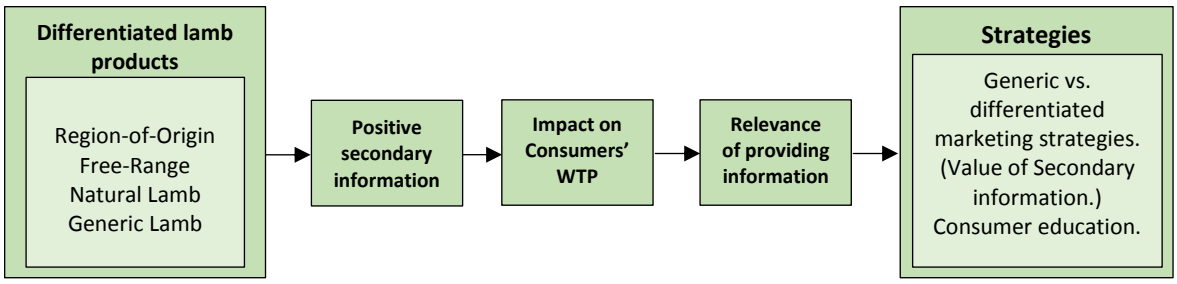

Figure 1.1: Conceptual framework
Source: Author's own compilation

This study is concerned with examining if and how positive secondary information about differentiated fresh lamb meat products will have an impact on consumers' WTP. The WTP will be elicited through a physical experimental auction (EA) and an online stated preference questionnaire. The results are expected to show whether the provision of positive secondary information is valuable and how it will influence the marketing strategies employed by the industry.

1.4 Purpose statement

This study is concerned with examining whether providing positive secondary information (about the production claims of fresh lamb meat) has an effect on consumers' WTP. The effect which positive secondary information has on the consumers' WTP will be elicited through an experimental auction, where participants will be provided with specific information concerning production claims. Lamb meat products were identified based on the fact that there are distinct differentiated products within the industry. Some of these lamb meat products are marketed to the consumer at premium prices linked to certain quality claims. The need was established to investigate whether consumers know what these statements mean and whether or not positive secondary information with regard to these claims have an impact on consumers' WTP.

The purpose of this study is to determine whether positive secondary information about differentiated fresh lamb meat products will have a positive or negative effect on consumers' WTP. The study will research the degree to which consumers' WTP for differentiated fresh lamb products depend on the primary information labels, as well as investigating the effect of positive secondary information about the production processes. The effects will be measured over a time of three months (two experimental auctions, three months apart, with the same participants). Time plays a significant role in consumer memory, preference and reaction to information, and might have a negative influence on information retention and subsequently WTP.

1.5 Research objectives

The broad research objective of this study is to examine if, and how positive secondary information about product quality cues and attributes affect consumers' WTP for these differentiated fresh lamb products over time.

More specifically the study aims to address the following specific research objectives:

- To discover whether consumers understand what is meant with the different claims attached to differentiated fresh lamb meat products

- To determine if consumers are willing to pay a premium for differentiated fresh lamb meat products given their current inherent knowledge about the product

- To determine if consumers are willing to pay a premium for a product after positive secondary information about the differentiated fresh lamb meat product's quality cues and attributes are given

- To determine if consumers are still willing to pay a premium for a product three months after positive secondary information about that product's quality cues and attributes were given (i.e. no information will be provided again)

- To determine, based on the WTP results whether Generic or differentiated marketing strategies are more effective in the marketing of fresh lamb meat products.

1.6 Identifying the hypotheses

Lecocq, Magnac, Pichery and Visser (2005), states that the amount of information available to the consumer has an influence on their willingness to pay. When consumers have more information about a product, they will pay more for it, than consumers who are only partially informed. To analyse how WTP is impacted by secondary information, the secondary information presented must be credible, relevant and easy to understand. Conflicting information from the media, welfare groups and government is catalysing a paradigm shift in the way consumers think about food.

Therefore, the following hypotheses will be tested:

H_0: Presenting consumer with secondary information about differentiated fresh lamb meat products' quality cues and attributes will not have an immediate impact on their WTP for the differentiated fresh lamb meat product

H_1: Presenting consumer with secondary information about differentiated fresh lamb meat products' quality cues and attributes will not have an impact on their WTP for the differentiated fresh lamb meat product over time (three months)

Therefore,

H_0: The median difference in WTP between pairs[1] of information levels is equal to zero

H_1: The median difference in WTP between pairs of information levels is not equal to zero

Rejection rule: Reject H_0 when p-value < 0.05

[1] The respondents' WTP will be measured at three different time points. The first measurement will be based on the respondents' prior knowledge (without any new information provided). The second WTP value will be measured immediately after the respondents received positive secondary information. The third and final WTP measurement will be done three months after the positive secondary information is presented to the respondents. These different measurements will be compared to determine the impact of positive secondary information.

1.7 Methodology

In order to determine the long-term impact of positive secondary information on consumers' WTP requires an appropriate mechanism. Numerous scientific studies and literature describe methods to measure and elicit consumers' WTP for specific food quality attributes see inter alia (Cunningham, 2003; East, Hammond, & Lomax, 2008; and Huffman et al., 2003). The findings of this literature conclude that revealed and stated preference methods pose probable means towards understanding consumers' WTP.

In a study conducted by Cunningham (2003), WTP was effectively measured by the collection of market data that included differences in quantities demanded given different price levels. This method, however, can only be applied where actual market data and products exist. Where actual market data is not available, stated and revealed preference methods are often used. Stated preference methods are applied to elicit WTP where consumers explicitly state their WTP for a given product or attribute. These stated preference methods enable the researcher to create hypothetical market situations in which the consumer choice can be analysed (Lusk & Shogren, 2007). Revealed preference methods model consumer preference based on real consumer decisions and purchasing behaviour (Loureiro, McCluskey, & Mittelhammer, 2003). Revealed preference methods were originally used to estimate the preference for different transport options but have become an important tool in food preference research (Kroes & Sheldon, 1988). Revealed preference methods, in specific experimental auctions, provide an alternative method to study consumers' behaviour, where market data is unavailable. Through combining the advantages of revealed and stated preference methods, we enter the world of experimental auctions. Experimental auctions (EA) put the consumer in a working market setting where they can combine market feedback and information where real economic consequences allow them to state their true preferences that exist (Lusk & Shogren, 2007). Due to the fact that no market data for differentiated fresh lamb meat products exist, a random n^{th}-price auction was identified as the preferred auction mechanism to be applied in this research study.

A typical sample size ideal for eliciting WTP values are depended on factors such as financial and time constraints. Another factor to consider is the objectives of the study. As noted before, the objective of this study is to identify differences in WTP values between treatments of information and to determine an estimate of the mean WTP for differentiated fresh lamb meat products. According to Lusk and Shogren (2007) a sample size large enough to produce results, which are of statistical significance, would be preferred if the impact of information will be measured. A variety of sample sizes were used in studies with similar objectives. Cunningham (2003) tested the effect of information on Canadian consumers' WTP for Bison meat products, with a sample size of 57. In the study Liaukonyte, Streletskaya and Kaiser (2015) did on whether information had an effect on consumers' WTP over time, 110 participants participated of which 101 returned after three months. The study Liaukonyte, Streletskaya, Kaiser and Rickard (2013) did on the impact of labels and secondary information on WTP had a sample size of 351 adult participants. In the South African WTP study, Van Zyl (2011) did on food attributes; the sample consisted of 31 participants.

For this study, approximately 110 participants were randomly invited to take part in the auction, of which 23 of them accepted the invitation and attended the physical experimental auction procedures. Of the 23 participants, 15 returned for the second stage of the two-stage auction experiment. An online stated preference experiment (contingent valuation) was used as an ancillary to the experimental auction to reach a larger sample. Random emails were sent out to invite respondents to participate in the online stated preference surveys. For the online procedure, 124 participants started the survey process, but only 36 respondents completed both stages of the two-stage stated preference experiment. The participants for this study had to be regular consumers of red meat (ideally lamb meat products) and should be the main grocery buyers in the household. In addition, the participants should be from the upper-middle-class to wealthier consumer segments (LSM 7-10), as measured by the South African Audience Research Foundation's (SAARF), Living Standards Measure (LSM) segments[2]. Not only are these consumers

[2] These LSM segments were measured by the South African Audience Research Foundation. The segments are based on the South African consumers' access to amenities, and is not directly linked to the consumers' income levels. Within the LSM spectrum four lifestyle levels could be identified and defined, these groups are (Bureau for Food and Agricultural Policy, 2017):
LSM 1-3: Poor consumers.
LSM 4-6: Middle-class consumers i.e. the mass market.
LSM 7-8: The upper middle-class consumers.
LSM 9-10: Wealthy consumers

considered affluent enough to be able to afford fresh lamb meat products but they are also expected to be able to afford the premium for information on an already expensive food product[3]. The online stated preference experiment used the same questionnaires that were presented to the participants of the physical auction rounds.

A short pre-auction survey was conducted on the day of the auction. The information was used to gain a better understanding of the participants' demographic composition and their knowledge about differentiated fresh lamb meat products and their attitude towards the standard description of fresh meat products in general such as Free-Range, Region-of-Origin, Natural and Generic products. The auction consisted of a practice and several official-bidding rounds. During the first official-bidding round, the participants were presented with four packets of 500 g lamb loin chops as shown in Figure 1.2. All branding was removed, with only the production process (Free-Range, Region-of-Origin and Generic) used indicated on each packet with a label.

Figure 1.2: Photo of 500 g packs of differentiated lamb loin chops
Source: Author's own photo

[3] Lamb and mutton represents the most expensive meat option in South Africa (Bureau for Food and Agricultural Policy, 2017). The average Rand per kilogram (R/kg) for generic fresh lamb loin chops during 2017 were R170/kg or approximately €11/kg at the time. For differentiated lamb loin chops, the consumer would pay an average of R185/kg (€12.20/kg). Compared to differentiated beef sirloin steaks at R170/kg (€11/kg) and generic pork loin chops at R103/kg ((€6.70/kg), lamb and mutton is the most expensive meat product on South African shelves. The average exchange rate for the same period was R15.17/€ and was used for the calculation.

No additional information was given during the first round. Participants indicate their WTP (based only on the label) for each of the four packets by submitting the maximum monetary amount which they are willing to pay. At the start of the second round, positive secondary information with regard to each production process (as provided by SAMIC) was given to the participants after which they were asked to write down the maximum monetary amount they are willing to pay. After each round of official bidding, the bids were collected, sorted and a random number was drawn. This number indicates the cut-off position for the 'winners' of the round. After all the official bidding rounds were conducted, a bidding round and one of the four packets of lamb loin chops were randomly selected. The 'winners' of the round purchased the selected packet at the price equal to the bid at the randomly drawn position.

The motivation behind using this methodology was to effectively elicit the participants' true WTP values in a realistic economic environment. This information will enable us to identify whether or not providing positive secondary information as a marketing strategy will assist consumers in their decision-making process. A detailed explanation of the auction mechanism is discussed in Chapter Three.

1.8 Academic value and intended contribution of the study

The main contribution of this study is to address the gap in the information on the effect of secondary information on WTP. More specifically, to provide some insight into the impact of secondary information on South African consumers' WTP for differentiated fresh lamb meat products. The study will focus on the effect of positive secondary information and examine the changes in consumers' WTP for differentiated fresh lamb meat products once they are better informed about the production processes of the specific lamb meat product. The results could potentially be used to efficiently realign the lamb and mutton industry's marketing resources allocated towards providing positive secondary information to increase demand and WTP for the fresh lamb meat products.

The impact of positive secondary information on consumers' WTP, the value consumers attached to information about differentiated fresh lamb meat products, which resources consumers trust for information and what consumers understand about differentiated claims are some of the knowledge that might become known from this research. This new knowledge will ultimately contribute to filling the gap in information by meeting the broad research objective: if, and how positive secondary information about quality cues and attributes affect consumers' WTP for differentiated fresh lamb meat products over time.

The recent food safety scares have brought about new consumer preferences and demand for information about production processes and the origin of fresh meat products. The problem is not that consumers are receiving confusing information, but that consumers are not getting any information about the production processes of lamb and mutton. Because of this, it is crucial for marketers and producers alike to consider the information available to consumers about intrinsic and extrinsic characteristics adding to the differentiating qualities of fresh lamb meat products. Using intrinsic quality characteristics as extrinsic quality indicators might influence consumers' decision-making process.

The practical implication of the results of this study could be beneficial to producers and consumers. The South African red meat producers are competing in an ever-changing local and global market, which require producers to be adaptable. The results of this study could be used to develop new methods to ensure profitable production, which is essential in the changing environment. Providing information about the differentiated fresh lamb meat products' production processes at the consumers' decision-making point will reduce the information search cost. This reduction will increase the utility of purchasing and consuming fresh lamb and mutton products. By providing information through consumer education campaigns, and labels on packaging, awareness about each production process and what it contributes to the intrinsic and extrinsic characteristics, is increased.

1.9 Dissertation outline

Chapter Two starts the study off with an evaluation of the information problem in consumer decision-making. Chapter Three is dedicated to a literature review evaluating and discussing the techniques used to estimate consumers' WTP. The design and procedure details of a random n^{th}-price auction mechanism are discussed in Chapter Four. In Chapter Five, the demographic variables are unpacked to profile the lamb consumers based on product knowledge and behaviours. Chapter Six discusses the results of the experimental auction and stated preference analyses. The dissertation concludes with Chapter Seven, which is dedicated to concluding, with the results and findings as well as practical implications and recommendations.

Chapter Two

The information problem in consumer decision-making

2.1 Introduction

Information is the key ingredient in consumers' decision-making process. It motivates the consumer to buy a product or to leave it on the shelf. In the modern information age, it is imperative for marketers to understand consumers' behaviour when it comes to when and how they seek information and how they process it. By focussing on the when and how, as well as the information available to consumers, marketers will be able to realign marketing resources behind a specific way of marketing, coupled with the best type of information to increase demand for differentiated fresh lamb meat products effectively (Cunningham, 2003).

Verbeke (2005) stated that the models on consumer psychology and behaviour postulated that information moves people through a series of stages, referred to as a hierarchy of effects. Different consumers have different approaches to processing information, but the two most relevant ones relating to food safety and quality are the heuristic-systematic model (Chaiken, 1987) and the Elaboration Likelihood Model (ELM) of persuasion (Petty & Cacioppo, 1986).

Two modes are proposed by the heuristic-systematic model (systemic and heuristic), which consumers use to process information. The systemic model is constructed on investigative positioning in which consumers evaluate, examine and combine all valuable information to reach their decision. Systemic processing occurs when an individual comes across information of personal significance. The heuristic mode consists of simple rules of thumb, enabling the consumer to make quick decisions in complex situations or when the motivation, to consider potential outcomes, are low. Limited cognitive capacity is needed and explains why consumers fall into and prefer routine purchasing. The elaborated problem solving occurs when the first purchase is made. The ELM of persuasion postulates that believable messages are processed either through the central or peripheral route.

Active, in-depth information processing takes place in the central route while the peripheral route uses low connection and external cues about the information.

Tellis and Gaeth (1990) define information as the consumer's knowledge about the product outcome. Information can further be divided into three levels for the decision-making process. These levels are certainty, uncertainty, and ambiguity. In this context, certainty is the complete comprehension of the outcome, uncertainty is only the knowledge of the likelihood of different consequences, and ambiguity is the indistinct knowledge about the probability of the outcomes. In the instance where there is more information available about the price than quality, consumers are faced with three decision-making strategies. These three strategies are price aversion, price-seeking and best value. (Tellis and Gaeth, 1990). The best value strategy is applied when an item with the least overall cost (regarding price and expected quality) is selected. When the highest priced product is chosen to maximise expected quality, the consumer is carrying out a price-seeking strategy (with the assumption that the highest priced item is also the product with the highest quality). Price aversion is the selection of the lowest priced item to minimise the immediate cost.

Food-related decisions in the present agri-food environment are based on heuristics or follow peripheral routes of information processing (Verbeke, 2005). The search for and processing of information is inherently conditional on the consumer's need for information. There are various individual characteristics, which lead to the difference in information needs and the reaction to it.

The next sections of Chapter Two will provide an overview of the different types of information available to consumers and how they use primary and secondary information in their decision-making processes.

2.2 Word-of-mouth

Word-of-mouth (WOM) can loosely be defined as an informal conversation with the sometimes unintended ability to convey advice between individuals in a fast, unbiased and costless way (East, Hammond& Lomax, 2008). WOM can, for applicability to this research can be regarded as a source of auxiliary information. Companies are becoming more aware of the power that lies in WOM to influence consumer behaviour. Product choice can be encouraged through positive word-of-mouth (PWOM) or discouraged through the negative (NWOM). For consumers, the NWOM sometimes occur easier than the positive, while PWOM can be organic with little advertising, but most of the time it is managed and facilitated (East et al., 2008).

The number of times positive or negative WOM occurs, will affect the purchase probability of a brand (East et al., 2008). When consumers decide to switch between brands, WOM is often the main reason behind the change. It is particularly useful when consumers may feel they have a more personal connection with a brand. East et al. (2008), explains that there is difficulty in proving that NWOM has a greater impact than PWOM, although most marketers believe this to be true. The media also supports the ideology that negative information will have a more potent effect than the positive side of the story. It has been claimed that positive copy is four times less persuasive than negative copy (Fiske, 1980)

WOM cannot be observed and measured through direct means and has to be gathered through indirect methods such as monitoring social media postings about products and brands. Social media allows markers to establish a public voice and presence to both convey and collect vital information directly from the happy or unhappy consumer. Reliability is considered to be the default condition for modern brands. Therefore, unreliability is more useful, and NWOM will have more impact on the assessment process of undecided consumers.

Fiske (1980) explained that a gap exists between the position being implied and the position of the receiver. If the information which the receiver accepts reaffirms what they believe, their certainty will be increased, with the unlikely chance that other aspects of their

judgement will be changed. On the other hand, if the received information differs from that which is believed, the consumer's judgement may change. In other words, the more positive information a consumer receives on everyday matters will ensure that most consumers' position remains positive. Therefore, negative information will have a more significant impact on their judgement when it is received. Negative information is considered to be rare and therefore diagnostic, which makes it unexpected and will draw more attention.

In their study to determine whether PWOM or NWOM has the biggest impact, East et al. (2008) found that the impact of constructive and adverse advice was similar, but that PWOM was more powerful on the overall impact on brand purchase probability.

2.3 The value of brands

Brands are designed in such a way as to be able to communicate various types of information to consumers, who want to make a decision. Brands are considered signals of quality regarding higher mean and lower variation in quality. Regarding the appearance and design, these products are a cut above and transmit a prestigious social image (Yanhong, Zilberman & Heinman, 2005).

Yanhong et al. (2005), continues to explain that when a consumer buys a well-known brand, the uncertainty, and anxiety which is generated from thoughts that there is a possibility that they are making a wrong decision, is reduced. Brands have a tendency to generate substantial premiums and have therefore been used to enhance the value added of farming. However, consumers may be less willing to pay more for fresh produce brands since they are able to test the quality, to a certain degree, and reduce uncertainty by seeing, smelling, touching and tasting the fruit, vegetables or meat (Yanhong et al., 2005).

The 2008 study by Yanhong, Zilberman and Heinman states that ex-ante learning is a factor which determines the quality a consumer gains from purchasing a product. Ex-ante consumer learning, which, for example, involves consumers participating in in-store

demonstrations and tests to decrease uncertainty about product quality. Ex-ante consumer learning is considered to be a partial proxy to brands, in offering information about quality. When ex-ante learning is restricted, as with electronics and packaged foods, brands have substantial value in delivering information about the quality. The quality value of packaged food brands stems from the unavailability of valuable ex-ante measures to assess quality but is restricted by the non-durability of the products. The perishability and high availability of ex-ante learning in fresh produce reduce the value of brands for fresh food products.

Brands convey some form of prestige. By choosing a particular brand, for example, the consumer wishes to be associated with the quality elements of prestige that the brand, guarantees to offer to some extent. Prestige is much easier to achieve through clothing and, electronic brands, for the mere fact that the chosen prestige is visible to other consumers. Brands of food products are, according to Yanhong et al. (2008) possibly the least valuable source of prestige. Only the consumer buying and or consuming the food item(s) will observe and appreciate the full extent of the prestige, which is conveyed by the particular food brand. In their 2008 study, Yanhong, Zilberman, and Heiman found through conducting consumer questionnaires, that fresh produce brands contribute the least to product value. Furthermore, because fresh food products face greater uncertainty in the production process, it becomes harder to maintain a predefined standard of quality and design. The possibility of repurchase by consumers will most certainly be reduced if a brand is inconsistent concerning quality. Inconsistency generates negative word-of-mouth and undermines the investment in the brand.

The socioeconomic background of individuals may influence their attitudes towards brands (Zeithaml, 1988). By making use of this consumer information, brand managers and retailers can create market segments for target marketing, choose locations for retail, forecast brand expansion and design marketing mixes to convince the consumer to purchase a specific item rather than buying the competitor's item. The information, which a brand communicates, influences the consumer's WTP for that specific brand. Yanhong et al. (2008) state that brands, as a source of information, will be stand-ins to skills and time in the product quality assessment process. Extra information value will be added to

individuals with limited or low levels of education, skills, experience or product knowledge and to those with a time constraint or time too valuable to engage in intensive pre-purchase quality assessments. Zeithaml (1988) previously proved this statement when research showed that educated females with a time constraint were more likely to rely on brands when they purchased fresh orange juice. Higher income groups have greater opportunity costs of search times, which results in higher WTP for brands.

2.4 Quality indication marks

Within the context of the South African red meat industry, consumers are willing to pay a bit more for the peace of mind that the meat is healthy and of good quality (Van Zyl, 2011). This places some pressure on the red meat industry to provide credible information to consumers. Consumers' primary source of information is the front of pack labels. Research done by Stranieri and Banterle (2015) showed that consumers have some difficulty when "navigating through labelled information". Stranieri and Banterle explain that this could be linked to consumers' bounded rationality and external factors such as time constraints. Consumers' bounded rationality refers to the cognitive restrictions of the mind to process the total quantity of information within the available time to make a purchase decision (Stranieri & Banterle, 2015). Grunert, Fernandez-Celemin, Wills, Bonsmann and Nureeva, (2010) found that while food knowledge and label usage had a positive relationship, time constraints influenced the use of labels negatively. Verbeke (2005) argues that providing consumers with too much detailed information could result in information overload resulting in confusion, loss of confidence or total indifference. This problem connects with the mentioned "rational ignorant consumer", where the consumer does not consider any or all of the information available about the food products, despite the fact that the information is free (Stranieri & Banterle, 2015).

All agricultural products are connected to some geographical area of production or Region-of-Origin. Consumers use this information to tell apart products from different countries, regions or areas, to form a quality evaluation of the products. This effect of differentiation is embedded in the image the consumer has of the superiority of the specific product, to

the point where the Region-of-Origin is used as a source of information for determining the quality of the product (Du Plessis & Du Rand, 2012). The product is linked to knowledge the consumer may already have of the region, which could include beliefs about production methods to climate and geomorphological attributes. In the Karoo, region-specific herb and shrub-like grazing vegetation are believed to contribute to the specific taste of the lamb and mutton meat produced in this region. These unique taste characteristics cannot be produced anywhere else in the world. This enables consumers to use the information about the Region-of-Origin during repeat purchases of the lamb and mutton meat. However, Region-of-Origin signals will have no significant impact on the consumer decision-making process if the consumer has no knowledge of the Region-of-Origin or when the product is experienced as a trial purchase (Grunert, 2005).

Meat products, especially fresh lamb and mutton meat products in South Africa need to communicate the differentiated qualities to consumers. This will enable consumers to make inferences about the quality of the meat products, which will assist them in the internal stage of the decision-making process. If this information is not communicated in an effective way, consumers may become indifferent and will simply not purchase the differentiated fresh lamb and mutton products. The strategies of providing massive amounts of information to consumers to reduce the information asymmetry have a limited possibility of success for the mere reason that a lot of information at a time will not focus on an exact consumer's information need.

The challenge, which marketers face with providing information, lies in identifying consumer segments, which need to be reached effectively (Verbeke, 2005). Verbeke identified four different segments of meat consumers: "the straightforward meat lover", "indifferent meat consumer", "cautious meat lovers" and "concerned meat consumers". All of these consumers have individual information needs. This process of segmentation is possible but can become challenging when variables such as motivation, personality and attitudes come into to equation. Generic approaches and strategies run the risk of overloading consumers with information, which will only create confusion and a lack of interest. This is counterproductive to the goal of solving market failures caused by information asymmetry (Verbeke, Pieniak, Guerrero & Hersleth, 2012). The information

from agriculture and food industries should be managed in such a way that the desired market segment is identified, their specificities well understood and taken into consideration to ensure that the provided information is effective and useful. In a study done by Ubilva, Foster, Lusk and Nilsson (2011) on consumer preferences with regard to pork, it was found that the provision of information about the production of pork had an effect on consumer preferences. After providing more information to the consumers, the Generic (non-differentiated) pork product looked similar to the differentiated pork product from the consumers' perspective.

The vast body of literature on food labelling and the role of information on consumer decision-making have revealed that labels have a noteworthy impact on consumer demand and their WTP (Bougherara & Combris, 2009; Liaukonyte, Streletskaya, Keiser & Bradley, 2013; Stranieri & Banterle, 2015). In their 2013 study, Liaukonyte et al. investigated the extent to which consumers' WTP rely on primary information labels as well as secondary information regarding the ingredients or production processes. Primary information is contained within the labels on the actual packages, which the consumer can read and interpret, while secondary information includes verifiable information regarding the ingredients or processes of production. Secondary information can be positive or negative. Negative secondary information summarises the views of critics while positive secondary information comprises of the supporters' statements about the ingredients or production processes (Liaukonyte et al., 2013)

The study by Liaukonyte et al. (2013), addressed concerns related to the "negativity effect" of labels and secondary information. This negativity effect holds that adverse information has a greater impact on consumer behaviour than positive information does (Kahneman & Tversky, 1973). The study focused on the impact of food product labels as an information signal on consumers' WTP and quantified to what extent consumers allocate greater weight to negative secondary information compared to positive secondary information. The findings revealed that primary labels, and particularly the content of the secondary information, had a significant impact on consumers' WTP. Negatively framed secondary information consistently had a greater impact on decision-making than comparable positively framed secondary messages. The study concluded that when consumers are

presented with additional information (positive or negative), they will consider the statements (primary information) with more confidence, update their prior beliefs and determine whether the ingredients or processes are in harmony with their true preferences (Liaukonyte et al., 2013).

Fox, Hayes and Shogren (2002) found that the framing of the information significantly influenced the WTP for pork products. The negative information dominated when consumers were simultaneously presented with positive and negative information. This happened even when the information provided was from a consumer activist group and written in a non-scientific manner. The results of Fox et al. (2002) suggest that favourable or unfavourable information affects the WTP for pork. According to Lecocq, Magnac, Pichery and Visser (2005), WTP is impacted by the amount of product information presented to the consumer. Consumers with greater perceivably positive information will pay more for the product than a consumer who is only informed to some extent. When consumers are presented with appropriate and reliable information, which is in an understandable format, the information becomes relevant in eliciting consumers' true WTP (Cunningham, 2003).

In 2007, Napolitano, Caporale, Carlucci and Monteleone found that the animal welfare information about the rearing conditions had a positive effect on meat acceptability among consumers. This finding is supported by more recent studies, which noted that consumer interests in organic production and the related information on the labels have a positive effect on consumer preference (Napolitano et al., 2010; Janssen & Hamm, 2012).

These studies have all shown that information on production processes, ingredients and animal welfare has a significant impact on consumer preference and decision-making. A final factor to consider is the influence which time has on this information and consumer memory. Different theories have different explanations for the interaction between information and memory (Kronlund, Whittlesea & Yoon, 2008). Among the theories, Braun-Latour and Latour (2004) postulated that time has a negative impact on the consumers' ability to retain information, commonly referred to as the "forgetting effect". Keller (1991) explains that researchers believed that a separate memory trace was created, for the

information communicated through an advertisement, which decayed over time. The failure to remember the information was due to the consumer's failure to find the right cue to access the content stored in memory. The newer view on consumer memory is that when comparable information is presented over time, the information is collapsed together and added to the consumer's knowledge about the brand or product (Braun-LaTour & LaTour, 2004). The long-term impact of introducing new information to consumers might be exaggerated by the immediate reaction captured in experimental studies (Liaukonyte et al., 2015). Dillaway, Messer, Bernard and Kaiser (2011) examined the long-term effect (seven weeks for this study) of food-safety information on consumers' WTP for chicken. The results showed that consumers are willing to change their behaviour to avoid unsafe products – both positive and negative information affected consumers' WTP. The negative effect, which the food-safety information had on the less safe products, continued in the long-term. This indicated that food products that are negatively affected by information would result in significantly lower WTP for an extended time (Dillaway et al., 2011).

2.5 The influence of quality on purchasing decisions

To maximise their expected utility, consumers collect, interpret and act upon the available information. Over the past few years, substantial significance has been placed on quality as a key concept not only for consumers but also for producers (Padberg, Ritson & Albisu, 1997). Oude Ophuis and Van Trijp (1995), define quality as synonymous with innate excellence that can only be recognised through experience. Quality attributes are therefore only observed after the product is consumed. Additionally, quality is a multidimensional concept containing many attributes, which cannot be assessed by a consumer in its entirety (Oude Ophuis & Van Trijp, 1995). These quality attributes create a variety of food choices, which becomes the largest component of the consumer's purchasing decisions (Grunert, 1997). Food choices address established and unique quality attributes. When faced with a purchase decision, consumers have a clear idea of the quality attributes they desire. Even the slightest variations in attributes will cause the consumer to evaluate comparable products differently (Melton, Huffman, Shogren & Fox, 1996).

There are two categories in which the information of product characteristics can be classified as; quality cues and quality attributes (Cunningham, 2003). These two categories are further divided into sub-categories: intrinsic and extrinsic quality cues, and experience and credence attributes. Table 2.1 provides clarifying examples of the difference between these quality cues and attributes for fresh meat products.

Quality cues can immediately be established and determined by the senses prior to consumption. These cues, normally informal stimuli are related to the quality of the meat product. Quality cues are further categorised by Oude Ophuis & Van Trijp (1995) as either intrinsic or extrinsic. Intrinsic cues are physically part of the product and cannot be changed without changing the product itself; examples include meat colour and the amount of visible fat.

Table 2.1: Quality cues and quality attributes of fresh meat products

Intrinsic quality cues	**Extrinsic quality cues**
Appearance	Brand name
Colour	Price
Size	Production information
Cut	Country or Region-of-Origin
Marbling	Place of Purchase
Experience quality attributes	**Credence quality attributes**
Taste	Way of production
Freshness	Environmental friendliness
Convenience	Vitamins and Minerals
Tenderness	Protein content

Source: Adapted from Oude Ophuis & Van Trijp, 1995:179

Extrinsic cues are not tangibly part of the product, but linked to it and can be manipulated without modifying the physical product. The best-known example of an extrinsic cue is the price. When no other information is available, and the quality of two similar products are judged, the higher priced substitute will be expected to be of higher quality (Oude Ophuis & Van Trijp, 1995). The production practices and or the Region-of-Origin of food products can also act as extrinsic quality cues (Stranieri & Banterle, 2015) and have an effect on consumers' assessment of these food items. The extrinsic trait such as a brand or the Region-of-Origin is directly related to the intrinsic value of the meat's colour, appearance and marbling for example. Grunert (2005) explains that consumers may use the Region-of-

Origin cue to link the product to their own knowledge of the region or to re-identify a product during repeat purchases of the product when there is no strong brand associated with the product. According to Oude Ophuis and Van Trijp (1995), these extrinsic cues can also be seen as credence attributes which, signals experience quality attributes, such as taste and tenderness to consumers. Additionally, the value of food is directly impacted by the Region-of-Origin and production processes due to the symbolic value, which these cues and attributes might have to the consumer (Stefani, Romano, & Cavicchi, 2006).

Quality attributes, on the other hand, are the functional and psychological benefits provided by a product. They represent attributes of what the product is perceived to provide to the consumer and are usually unobservable to the consumer prior to consumption. Experience and credence quality attributes can be distinguished. Experience attributes are identified while the product is being consumed and may include taste, tenderness, and product convenience. Because the credibility of these experience attributes will only be established during consumption, producers and suppliers must be confident that the claims are indisputable, or they might lose consumers (Cunningham, 2003). If meat was produced through a perceived animal-friendly process such as Free-Range, the quality attribute has to be credited by some form of information, which accompanies the meat product. How the consumer receives this, will affect their personal values to a degree to where they attach significance to certain credence quality attributes (Oude Ophuis & Van Trijp, 1995). Conversely, credence attributes cannot be identified before, during or after consumption Credence attributes are regarded as search cues contained on labels, which allows consumers to learn more about the intrinsic characteristics of meat products. Interestingly, credence related claims need to be made by a reliable third party to be considered credible by the consumer (Cunningham, 2003). The judgement and information relating to the credence attribute made and shared by the third party become the only source for the consumer to rely on when making purchasing decisions.

Historically, the production and sales of Generic commodities have dominated agricultural markets. In recent years, however, a prominent tendency has developed toward a more demand-driven marketplace in which agricultural producers must take into account and

weigh consumers' demand for specific attributes prior to production (Lusk, 2003). This shift in consumers' paradigm, which carried over into the production and marketing of foods, can be observed in the increase in quality differentiated foods, such as "Natural", "grass-fed" and "organic".

2.6 Information related to differentiated lamb meat products

The Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act no. 54 of 1972) No. R. 146 issued by the South African Department of Health requires the obligatory declaration of all food ingredients on food labels, including certain defined allergens. Additionally, the Consumer Protection Act safeguards individuals from mistreatment of any kind in the marketing and sale of consumer goods (Cawthorn et al., 2013). It is also required by this Act that all the information on the labels must be objective, verifiable and understood by consumers. Any new labelling legislation should thus focus on consumers' evolving need for information and their desire for information disclosure to make suitable food choices. Although labels receive only limited consideration and deliberation in the decision-making process (Stranieri & Banterle, 2015), product labelling remains useful to improve communication regarding information about the contents of food.

In South Africa, the regulations regarding the classification and marking of meat intended for sale in the Republic of South Africa (Government Notice No. R.55 of 30 January 2015) does not allow any misleading indications to be used on any meat (beef, lamb, mutton, pork or goat) products. In correspondence with Niel Erasmus (Chief Food Safety and Quality Assurance Officer, Directorate Food Safety and Quality Assurance, Department of Agriculture, Forestry and Fisheries, 2017) the following was made clear; if a producer or marketer use any indications on such products, they are required to supply evidence and proof that the product adheres to the standards of the indication and that they are inspected or audited against that standard. In response to this, the Department of Agriculture, Forestry and Fisheries (DAFF) created a process in the regulations through which any producer or marketer can create their own standards, which will be audited and inspected by the South African Meat Industry Company (SAMIC). Currently, there are no

formal set standards in the South African legal framework for any of the following meat quality indications claims: “Free-Range”, “Grass-fed”, “Grain-fed”, “Natural”, “Region-of-Origin”, “Generic” and “Feedlot”. This led to the registration of many producer or retailer linked quality indications pertaining to production practices.

SAMIC is appointed by DAFF as an assignee for the purpose of the application of sections 3(1)(a) and (b) and 8 of the Agricultural Product Standards Act (Act No. 119 of 1990) These items relate to the classification and marking of meat intended for sale in the Republic of South Africa. SAMIC is responsible for making sure that there is no conspicuous misleading information within these differing claims. Currently, DAFF is in the process of amending the Agricultural Product Standards Act (Act No. 119 of 1990). These amendments will allow DAFF to set more formal and specific standards for claims and indications such as “Free-Range”, “Grass-fed”, “Grain-fed”, “Natural”, “Region-of-Origin”, “Generic” and “Feedlot”. Although there are no official definitions registered at DAFF for these quality indications the following definitions are used by SAMIC for auditing purposes.

Free-Range lamb is defined as lamb meat sourced from farmers which do not make use of feedlots, growth promoters and routine antibiotics. The animals are free from hunger and thirst, pain, disease or injury, reared in an appropriate environment, can express normal behaviour and are free from fear and distress (SAMIC, 2016a). Region-of-Origin differs in that only animals originating (born in) the Karoo, or alternatively, originated outside the Karoo but remained in the area of the Karoo for a continuous period of at least 6 months before slaughter in the Karoo. Only animals that feed freely on indigenous veld in sizable camps representative of the identified typical Karoo vegetation and has access to clean water qualifies for certification. No routine antibiotics are allowed and the withdrawal periods have to be adhered to. Added hormones are prohibited. The Region-of-Origin mark guarantees full traceability (SAMIC, 2016b). Lamb products, which are both Free-Range and Naturally reared are marketed under the Certified Natural claim. These animals roam free, have free access to feed that is free of animal by-products and have access to clean drinking water. The use of hormones and stimulants are prohibited, and strict antibiotic control is a requirement. Slaughtering, chilling and processing procedures are well controlled, and traceability from fork to farm is required (SAMIC, 2016c). The sellers

or marketers of Generic lamb or mutton meat products are not allowed to state or make any claims with regard to these unregistered fresh meat products.

South African meat products are currently classified and marketed according to the Regulations Regarding the Classification and Marketing of Meat Intended for Sale in the Republic of South Africa (No. R. 55 of 2015) under the Agricultural Product Standards Act, 1990 (Act No. 119 of 1990). Other legislation regulating the meat industry include the labelling regulations as stipulated in the Regulations Relating to the Labelling and Advertising of Foods (No. R. 429 of 2014) under the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972). These documents do not put any legislative obligation on marketers or processors to define or communicate the production process (secondary information) practised in rearing the animal producing the meat. This reiterates and confirms the statement made that there are no formal set standards in the South African legal framework for the production of quality indication claims such as: “Free-Range”, “grass-fed”, “grain-fed”, “Natural”, “Region-of-Origin”, “Generic” and “feedlot”. If any claims of the sort are made, the following is required according to the labelling regulations No. R. 429 of 29 May 2014 (Department of Health, 2014): “Any word, statement, phrase, logo or pictorial representation which implies a message of being additive-free or veterinary medicine-free or which indicates the more humane treatment/rearing of food animals, such as, but not limited to, "grain-fed", " grass-fed", "Karoo lamb", "Natural lamb", "country reared", "Free-Range", "pure", which are linked to specific protocols which are approved or registered with the Department of Agriculture, or regulated in terms of the Agricultural Products Standards Act, 1990 (Act 119 of 1990) or National Regulator for Compulsory Specifications Act, 2008 (Act 5 of 2008), will be permitted on the pre-packaged labelling and advertising of these products.” (Department of Health, 2014). These Acts only provide regulations regarding the classification and marking, labelling and advertising of fresh meat. Even though the Department of Agriculture needs to approve the standards, any producer or marketer can create and register their own standards of production of the mentioned quality indications.

2.7 Summary

The information problem in consumer decision-making is of importance not only to the uncertain consumer but to producers and marketers as well. Knowing if and how consumers use information will enable marketers and producers to provide relevant and useable information to consumers. Chapter Two gave an overview of how consumers use primary and secondary information in their decision-making processes, through the heuristic-systematic model. The power of positive and negative word-of-mouth related to brand repurchase probability was discussed, after which the value of brands was unpacked and evaluated. Quality indication marks were discussed, which led to the explanation of quality cues and attributes of fresh meat products. In section 2.6 the information relating to differentiated fresh lamb meat products in the South African context was critically evaluated. The regulations set out within the South African legislation is of utmost importance for the experimental part of this study, as this is an indication of how information is managed and provided to the South African meat consumer. Chapter Three introduces the world of experimental economics and how to elicit WTP using experimental auctions.

Chapter Three

A review of methods for measuring consumers' willingness to pay

3.1 Introduction

To assist agricultural producers, processors and marketers in the market research process, agricultural economists are gradually making more use of experimental auctions to elicit consumer demand and WTP (Lusk & Shogren, 2007). Within the experimental setting where real money and real products are, exchanged participants have a greater motivation to reveal their true value for a product. Fundamentally, experimental auctions are an approach, which combines the advantages of revealed and stated preference methods of determining WTP (Lusk & Shogren, 2007). With the purpose of understanding the world of experimental auctions, the building blocks of this world will be explored in the sections to follow.

Our values are reflected in our choices. When people choose to spend an extra hour at work rather than at a social event, purchase more food and groceries rather than electronic equipment or drop the unwanted change into the charity-can at the till-point or not, reveals their relative values. The economic value of these choices is determined by the rate at which a consumer is willing to trade one good (or service) for another. A consumer's maximum WTP, to purchase a good, captures this rate of economic value (Lusk & Shogren, 2007). Numerous methods of how to collect and measure data on consumers' WTP are described within a vast body of scientific literature. Two of the most well-known methods used to estimate WTP is through eliciting revealed or stated preferences (Lusk & Shogren, 2007).

Revealed preference methods use actual market transactions to model consumer preferences (Loureiro et al., 2003), while stated preference methods are based on surveys in which the participants are directly questioned about their WTP (Hanley, Shogren & White, 2013). Stated preference methods ask participants to state their value for the (new) product. The advantage of making use of stated preference methods is that a hypothetical

product or market can be created. A disadvantage of this method is that the respondents are aware that the product is hypothetical which can lead inconsistencies due to the absence of market discipline (Lusk & Shogren, 2007). Revealed preference methods are normally used when existing market data is used to derive implicit values for a product, which already exists in the market (Lusk & Shogren, 2007). Lusk and Shogren (2007) continue to explain that one of the advantages of revealed preference methods is that actual choices are examined. A downside, however, is that the assessment is implied and will need to be inferred from observed patterns. Lusk and Shogren (2007) put the debate of, which method is best, revealed or stated preference, to rest when they stated that experimental auctions combine the advantages of revealed and stated preferences. Within this chapter revealed and stated preferences will briefly be reviewed, which will lead to the discussion on experimental auctions.

3.2 Revealed preference

Revealed preference methods (hedonic pricing, travel cost method, and defensive behaviour and damage cost methods) examine the real choice of a consumer, but the valuation is indirect and must be inferred from empirical patterns. This method is a technique, which uses actual consumer decisions to elicit WTP values, through modelling consumer preferences and exploiting the fact that true preferences are revealed through the decision (Loureiro, McCluskey, & Mittelhammer, 2003). When making use of revealed preference methods, real choice-experiments are examined which results in very accurate data (Lusk & Shogren, 2007).

The WTP for existing goods can be measured by collecting market data on quantities demanded at different prices. This method is normally employed within a retail environment where the retailer allows prices and information about a product to be changed, for the researcher to record actual purchases (Lusk & Shogren, 2007) However, when prices are controlled to elicit consumers' revealed preference in a controlled market setting, consumers' true WTP might not be revealed. Lusk and Shogren continue to explain that this data will however only reveal that the buying consumers' WTP is at least as high

as the controlled price, while the non-buyers' WTP is lower than this price. This method will therefore not reveal the true WTP.

3.3 Hedonic pricing

Differentiated (or heterogeneous) products are products with characteristics which varies in such a way that there are distinct product types within the same market. According to Taylor (2003), the ability of the hedonic pricing method to determine the value of the underlying characteristics of the differentiated goods lies in the method's dependence on real market transactions for these differentiated products. The hedonic pricing approach is useful when the relationship between product quality and price are being studied. Hedonic models are generally used in environmental- and property market studies. Property value models are used to determine the premium a household is willing to pay to purchase a property close to, or away from an environmental feature (Boyle, 2003b). The WTP for a specific attribute is measured by comparing the market value of two similar products, which are only different in that specific attribute. The implicit price of specific attributes is defined as the derivative of the price with regard to the specific product attribute. The implicit price for the attribute is assessed by comparing the price a buyer is willing to pay for the product possessing the attribute with the price of a product without the attribute (Lusk & Shogren, 2007). The relationship between the observed price and the number of attributes contained in the product is captured in the hedonic price function. This method is, therefore, an indirect valuation method in which the consumers' value for the product characteristics are inferred from the observed market transactions (Taylor, 2003).

Hedonic pricing has also been used as a value elicitation method in the agricultural- and food sector with specific reference to the wine industry (Langyintuo, Ntoukam, Murdock, Lowenberg-DeBoer & Miller, 2004; Lenz, Mittelhammer & Hillers, 1991). Noev (2005) used a hedonic pricing model to estimate the effect of wine quality and regional and varietal reputation on wine prices in Bulgaria. Combris, Lecocq and Visser (1997) used a hedonic price technique to show that the market price of Bordeaux wine is determined by

independent characteristics, meaning the label on the bottle, but also the sensory characteristics of the wine. The hedonic pricing model is thus widely applied in the estimation of WTP for specific food attributes and durable goods.

3.4 Travel cost method

The travel cost method is a non-market technique used in environmental studies to place a value on recreational sites. In other words, Fleming and Cook (2008) explain that because it is difficult to determine the true value of items, which are not sold in a real market, a value for a recreation site is obtained by considering how much money people are willing to spend to reach the site. The cost of consuming the recreational site is used as a proxy for price. The travel cost method is typically used to approximate values of use for recreation activities and any changes in these values caused by changes in the quality of the environment (Boyle, 2003b). Parsons (2003) explains that the travel cost model is a demand-based model generally used in benefit-cost analyses in cases where Natural resource damage needs to be determined. The model is used to estimate use-values only because the estimations are based on observed behaviour.

3.5 Defensive behaviour and damage cost methods

The actions people take to reduce the environmental damage is referred to as defensive behaviour, for example, to reduce pollution and minimise the adverse effect of exposure to it. This method assumes that rational people will take defensive action as long as the cost of the defensive action is less than the value of the avoided damage. The value of the avoided damaged therefore is inferred from the cost of the defensive behaviour (Dickie, 2003). Dickie explains that damage cost is the real resource cost of the pollution. This cost includes direct expenditure to treat illnesses or to restore, replace or sustain damaged materials, while the opportunity cost of reduced or foregone productivity due to environmental contamination is captured by indirect cost.

The defensive behaviour method calls attention to the way in which people respond to environmental changes and the influence of their behaviour on the experienced consequences. However, the damage cost method indirectly assumes that the behavioural response to changes in the environment is non-existent or ineffective (Dickie, 2003). The design of the defensive behaviour method enables the process to deliver an economic value, like WTP. From the short explanation, it is clear that both methods are frequently used to determine the value of changes in health and pollution.

3.6 Implementation of revealed preference methods

The fundamental theory of experimental auctions is partly built from the methods of revealed preference. It is therefore important to understand the strengths and limitations of revealed preference methods.

Lusk and Shogren (2007), state that the main advantage of using revealed preference methods is that real choices obtained from real data are examined. The methods all depend on revealed behavioural (actual choices) data. All the methods except, the damage cost method infers values from individual choices, for example, the decision to visit a recreational site (travel cost), the decision to purchase a product with certain qualities (hedonic price), and choosing to make expenditures to avoid exposure to adverse environments. Damage cost is a result of individual and public decisions. Damage cost is therefore not as desirable from an economic perspective, to use in consumer choice studies (Boyle, 2003b).

A weakness of revealed preference methods is that it cannot be used when a unique product is being developed. This is because consumer behaviour will not be directly observable since the product does not exist yet. (Lusk & Shogren, 2007). Caldas and Black (1997) pointed out that the results and choices made against the actual set of options when using this method depend only on the respondent's existing market perception. Therefore, the researcher cannot control the boundaries of the experiment. This means that the researcher has no control over any outside influence that could influence the respondent's

market perception in the actual market situation where the data was observed. Revealed preference methods are not able to estimate values for quality levels, which the respondents have not experienced.

3.7 Stated preference

Another way to elicit WTP is through stated preference methods, which use individual participants' preference statements to elicit WTP values for a given good. Kroes and Sheldon (1988) casually defined stated preference methods as a "family of techniques which use individual respondents' statements about their preferences" of a specific good or service to elicit WTP values for the given product or service. Lusk and Shogren (2007) explain that when stated preference methods are applied, the respondents are asked to state the monetary value that they attach to a particular good or service (directly or indirectly). Survey questions are used to engage respondents to state their choices, describe their behaviour and state their WTP for a specific product or attribute. The three most used methods within this family of techniques are contingent valuation, conjoint analysis, and choice experiments. A summary of stated preference food and in particular meat studies are given in Table 3.1.

3.7.1 Contingent valuation

The contingent valuation method is a survey-based technique, in which respondents directly state their preferences (in a monetary value) for particular attributes of a product. These preferences are used to elicit the respondents' WTP values for a given product or service (Boyle, 2003a; Lusk & Shogren, 2007). The instrument used to obtain these preferences is a questionnaire with open-ended and dichotomous choice questions - which could be single or double-bounded. Single bounded questions require a yes or a no answer, while doubled-bounded questions involve a follow-up question requiring the respondent to state a lower value. Open-ended questions typically require the respondents to state their WTP value, without being given a market value for the product.

Contingent valuation methods create a market where no actual transactions are made. The direct questioning technique of contingent valuation makes the method flexible and affordable to implement (Romano, Finco, Rosenthal, Finco, & Deliza, 2016). One of the main features of the contingent valuation method is that the technique evaluates how consumers' preferences change as product attributes change.

Although contingent evaluation is typically used to determine consumers' preferences for nonmarket goods, it can be used to elicit WTP for quality attributes of existing goods. This is achieved when respondents state their WTP to acquire a product but are not obligated to make a payment and do not receive the product (Maynard, Hartell, Meyer & Hao, 2004).

3.7.2 Conjoint analysis

The conjoint analysis procedure was developed within the field of mathematics, psychology and psychometrics to measure consumer purchase decisions. Conjoint analysis or trade-off analysis is used to evaluate buyer trade-offs among products with multiple attributes (Walley, Parsons & Bland, 1999). When consumers are faced with various attributes of competing products, the decision-making process often requires a trade-off between these products and their specific attributes. The goal of a conjoint analysis is to infer the satisfaction, which consumers attach to product attributes, which in turn will determine the relative importance of these attributes (Walley et al., 1999).

A conjoint analysis presents the consumer with choice alternatives (choice sets) described in terms of or defined by a set of attributes (from the conjoint design). Participants are then asked to evaluate the choice sets and rank them on a scale to indicate their preference for the different sets. This allows the researcher to analyse the respondents' evaluation and trade-offs when a purchase is made (Darby, Batte, Ernst & Roe, 2008). The conjoint analysis technique does not directly ask the respondents which attributes are important but forces the participants to make trade-off decisions between products, revealing their actual preferences. This makes the conjoint analysis a valuable outward expression of consumers' core values for product attributes.

3.7.3 Choice experiment

One of the widely utilised stated preference methods applied to the general analysis of consumers' choices and WTP for products or services are choice-experiments. A choice-experiment, in novice terms, can be defined as a setting where respondents are asked to choose between different products with pre-specified attributes, with the goal of eliciting consumers' stated preferences for the given attributes represented in the choice sets (Mørkbak, Christensen & Gyrd-Hansen, 2008). Choice-experiments are often used in the application of agricultural economics (Enneking, 2004; Alpizae, Carlsson & Martinsson, 2003; Loureiro & Umberger, 2007). The design of a choice-experiment gives the participant the option to decide between two or more product options, each option with a set of attributes at different levels. Each product option would typically be referred to as a choice set, with the various attributes defining the choice set (Alpizae et al., 2003). Loureiro and Umberger (2007) illustrated that a non-choice option is usually also included amongst alternative choice-sets. A more realistic purchase situation is created by including a non-choice option because consumers could decide not to purchase the good or choose to make the purchase at a different store (Enneking, 2004).

In the choice-experiment participants would be asked to choose the most preferred product option available to them. A choice-experiment can be done through the presentation of choice sets to participants. Various presentation methods are possible such as voiced descriptions, illustration presentation, physical, graphical or photographic presentation. With this systematic trade-off between pairs of products, the researcher would be able to estimate the utility and WTP for separate attributes. In the design of choice-experiments, the choice sets are exhibited in such a manner that participants are presented with a hypothetical setting of different product options defined by a given number of attributes and associated attribute levels (Lusk & Shogren, 2007).

3.7.4 Implementation of stated preference methods

The main strength of stated preference methods is that a hypothetical market can be created by the researcher in which the consumer can transact namely to buy or sell goods, indicating that consumer choices about a proposed product can be analysed (Lusk & Shogren, 2007). These preference methods are fairly easy to control and not as expensive as revealed preference methods due to the hypothetical situations and products which are presented (Kimenju, De Groote & Morawetz, 2006). For developing countries with only a limited budget for research, stated preference methods make for an attractive alternative.

Stated preference methods also have some weaknesses. The participant's stated preference might not correspond closely to his actual preference. This is due to the hypothetical nature of the questions and the fact that no actual behaviour is observed (Loureiro et al., 2003). As participants are not required to make any real economic commitment, stated WTP values could be higher than what the participant is actually willing to pay for a given product. Stated preference methods have also been criticised for not being incentive compatible. Stated differently, the respondents do not have any incentive to state their true WTP, as there is no obligation or consequences for their stated value (Kimenju, DeGroot & Morawetz, 2006).

Furthermore, respondents might be unfamiliar with the good and not have an adequate basis for evaluating and stating their true value (Lusk & Shogren, 2007). The good represented in the stated preference situation could be hypothetical (novel good not yet on the market) or unknown to the participant. Consequently, the respondent will not have any idea of what value to attach to such a product seeing as there is no point of reference. This could lead to over- or understating their WTP values for the product, whereas if the product was presented to them, they could have a clearer understanding of it and state their WTP more accurately. Table 3.1 provides a summary of studies where stated preference methods were used to elicit consumers' WTP for meat products and its attributes such as meat origin and animal treatment practices. In the studies summarised below a positive WTP was observed, indicating that consumers do consider meat attributes and are willing to pay a premium for the preferred attributes.

Table 3.1: Summary of stated preference studies

Authors	Focus	Mechanism applied	Main Results
Enneking (2004)	The study investigated consumers' WTP for a quality assurance scheme within the German meat sector, specifically meat marketed with a 'quality and safety' label. The meat product used was packaged liver sausages.	Choice experiment	The empirical findings were that the quality labels significantly influence consumers' decision-making behaviour and that WTP estimates varied across brands.
Loureiro & Umberger (2007)	This research used a unique data set to determine the relative value US consumers placed on several relevant beef attributes, such as origin, food safety, traceability and tenderness. Ribeye steak steaks were used for the study	Choice experiment	The participants of this study valued USDA food safety inspection certification higher than any other of the choice set attributes, including origin labelling, traceability and tenderness.
Walley, Parsons & Band (1999)	The research sought to determine the importance of quality assurances schemes in the decision-making process of consumers. The meat product used was minced beef.	Conjoint analysis	The study found that quality assurance schemes influence the consumer decision-making process for minced beef and in addition, provides an indication as to its relative importance. Quality assurance schemes appeared to improve consumer confidence.
Verbeke & Roosen (2009)	The study focused on whether origin, quality and traceability labelling is an appropriate way to differentiate fresh meat and fish products.	Primary data were collected by means of four consumer surveys over five years	Direct information cues of quality were more appealing to consumers than those about traceability. Meat's differentiation potential of origin and quality labelling is mainly connected to its healthiness appeal.
(Mørkbak, Christensen & Gyrd-Hansen (2008)	This study was done to elicit whether consumers' WTP for reducing the risks of Salmonella infections was affected by the specific risk reduction methods practised at slaughterhouses in Denmark. Pork mince was used.	Choice experiment and an online questionnaire	The results indicated that consumers are willing to pay for safer meat, but there is a limit to what they are willing to pay. The consumers cared about how the risk reduction occurred. They preferred that risk reduction and decontamination occur at farm level.
Romano et al. (2016)	The study estimated Brazilian consumers' WTP for value-added pomegranate juice. Technology, which preserves vitamins and antioxidants, is used to process the juice. This process keeps the flavour of fresh juice without adding colourants and preservatives.	Contingent valuation	The results showed that consumers were willing to pay more for the value-added juice. The study revealed that consumers with higher incomes were willing to pay more for the niche-defined product.
Li, Curtis, McCluskey & Wahl (2003)	A consumer survey was conducted in Beijing, China to determine Chinese consumers' WTP for genetically modified rice and soybean oil.	Contingent valuation	Although the majority of the respondents indicated that they had little or no knowledge of biotechnology, their attitude towards GM foods was positive. This positive opinion about GM foods had a positive impact on WTP values. The results implied that there is a market for GM foods in China.

3.8 The value of revealed and stated preference methods

From the previous discussion, it is clear that both methods of revealed- and stated preference have prominent advantages, but are also lacking in certain aspects. The main shortcoming of stated preference methods is that it is not an incentive compatible mechanism. Subjects facing a hypothetical setup tend to behave differently from a real-life situation (Lusk & Shogren, 2007). Participants would typically overstate their WTP, due to the facts that there are no actual consequences to their actions. The main weakness of revealed preference methods is that only an existing good or service could be valued. No new good could be valued because the method is based on observing existing patterns.

Subsequently, a need was identified to establish an approach to overcome some of these shortcomings and offer a combination of the advantages of both methods (Lusk & Shogren, 2007). Combining the advantages of both methods leads us to experimental economics as an alternative to the hypothetical approaches by providing real choices with real consequences for consumers' stated values. Experimental auctions are an example of an efficient quantitative research method, to present consumers with real choices where they are obligated to reveal their true preferences because the auction can be designed in such a way that the participants may actually have to pay their bid price for the product (Combris, Lange & Issanchou, 2006).

This point of argument leads to the discussion on experimental auctions. This chapter will further explain the advantages of EA over the conventional methods of estimating consumer preferences and WTP. Experimental auctions put the consumer in an active market environment where they can combine market feedback and information, and where real economic consequences to stating their true preferences exist.

3.9 Experimental auctions

Experimental auctions are quantitative research methods used in applied economics. This research method was originally developed as a mechanism to elicit information about people's values concerning monetary lotteries. Decades later, researchers found that experimental auctions could be a powerful tool, resulting in the implementation of experiments to extract participants' values about goods and services in real-life situations (Lusk & Shogren, 2007).

One of the most important advantages of conducting an experimental auction is that the researcher creates a hypothetical market situation with real money and products, where some variables can be controlled, but still offer the participants an incentive to state their true WTP (Lusk & Shogren, 2007). Incentive mechanisms give participants a chance to actually purchase products by bidding for them. In the majority of experiments where eliciting, WTP was the final objective; participants were asked to give their maximum monetary value at which they would agree to buy a product which they had evaluated (Combris, Bazoche, Giraud-Héraud, & Issanchou, 2009). In normal bargaining situations, it is not in the best interest of the bidder to reveal their maximum price, unless this would not influence the price which they are actually going to pay. An experimental auction is an incentive compatible when a participant has a motivation to submit a bid which sincerely reveals their true value or preference for the good up for auction. In other words, a participant's dominant strategy would be to reveal their true value for the good through their bidding behaviour, i.e. the mechanism is incentive compatible if the market price paid by a person is independent of what they bid (Lusk & Shogren, 2007).

Lusk and Shogren (2007) continue to explain that participants do not perceive a gain or loss from simply stating their preferences and believe that their answers to hypothetical questions are insignificant and without consequence. A vast amount of evidence in the economic literature suggests that people overstate the amount which they are willing to pay in hypothetical settings as to when real money and goods are on the line (Lusk, 2003). A variety of auction mechanisms are considered incentive compatible, but little theoretical

evidence is provided as to which mechanism should be preferred over another (Lusk, Alexander & Rousu, 2007).

The most important task in implementing an experimental auction is deciding which mechanism to employ. There are a number of mechanisms, which can be used to elicit values, of which three demand-revealing and incentive compatible auction mechanisms will now be discussed. These mechanisms include; Vickrey's second price auction, Becker-DeGroot-Marschak (BDM) mechanism and the random n^{th}-price auction.

3.9.1 Vickrey's second price auction

Vickrey's second price auction has been a popular mechanism, which has been widely used since its introduction in 1961. This mechanism argues that a bidder will be best off when they bid truthfully (Vickrey, 1961). The popularity of this mechanism is largely due to it being demand revealing, relatively uncomplicated to explain and it has an endogenous market-clearing price (Shogren, Margolis, Koo & List, 2001b). The participants have an incentive to be honest because the auction disconnects what they pay from what they say. More specifically the winner buys one unit of a good and pays the second highest price. The endogenously determined price means that the payment price would be equal to one of the bids submitted, thus originating internally by the auction mechanism through the bids (Lusk & Shogren, 2007).

The standard Vickrey auction follows the following procedure; Participants submit their sealed bids. The bids are sorted, and the highest bid is determined. The good up for auction is then awarded to the highest bidder, but at the *second-highest* price. In other words, the person who bids the most, gets the good, but only has to pay the price equal to the bid made by the second-highest bidder. As explained above, it is now clear that the price paid by the winner is determined endogenously through the design of the auction mechanism and not randomly, as it will always be the second highest bid.

A participant cannot be better off by bidding insincerely, and therefore it is in their best interest to bid their true value – sincere bidding is the weakly dominant strategy (Shogren

et al., 2001b). It is impossible for a participant to (truthfully) determine the price they are going to pay. When overbidding, the participant could win the auction, but at the risks of paying more than what the good is worth to the winner. Underbidding can lead to a participant missing the chance of a profitable purchase (Vickrey, 1961). The main problem of Vickrey auctions is at the individual level. Participants will often bid insincerely, especially bidders who are said to be "off-margin" bidders (Shogren et al., 2001b). The off-margin bidders are bidders whose values for the good are far above or below the market-clearing price. Vickrey auctions fail to engage the low-value bidders who believe they will never win and consequently deem the auction unreliable (Shogren et al., 2001b). It has been suggested that Vickrey auctions create an environment, which is too competitive to elicit participants' true WTP (Shogren, Cho, Koo, List, Park, Polo & Wilhelmi, 2001a). Participants might be submitting bids just to win, for the sake of being victorious.

3.9.2 Becker-DeGroot-Marschak (BDM) mechanism

The BDM auction mechanism was introduced and used in 1964 when Becker, DeGroot and Marschak found a way to induce individuals to truthfully reveal certain equivalents for lotteries (Lusk, Feldkamp & Schroeder, 2004). This mechanism is not an auction as such, as the participants do not bid against each other as in the Vickrey case.

BDM auctions are relatively easy to explain to participants and therefore repeated practice rounds are not always necessary. Lusk, Alexander and Rousu (2007), explain that with the BDM mechanism participants do not bid against each other, but rather against the random price generator. A simple format of the BDM is where the participants submit a sealed bid for the good on auction. The bids are sorted, and a random price is then drawn from a predetermined range of prices. If a participant's bid is greater than the randomly drawn price, the participant will purchase the good at the randomly determined drawn price (Lusk & Shogren, 2007).

The BDM mechanism is also classified as an incentive compatible auction mechanism, where the participants' weakly dominant strategy is to submit a bid equal to their true WTP value. Once again underbidding will increase the likelihood of missing out on a profitable

purchase while overbidding will increase the chance of making an unprofitable purchase (Shogren et al., 2001a).

When the BDM mechanism is employed, there are several factors, which a researcher needs to consider. These considerations, for example, are, what price distribution should be used for the random price generator and how, or if this should be communicated to the participants. Cunningham (2003) argues that it is important not to reveal the upper and lower boundaries of the possible price range to the participants, as it could contaminate the demand-revealing characteristic of this auction mechanism. Lusk (2003), explains that the BDM mechanism is the only mechanism that can be used on an individual basis that does not require a group of subjects because participants are not required to bid against each other. This means that the mechanism is useful in field settings such as grocery stores.

3.9.3 Random n^{th} – price auction

In multiple auction rounds, participants with relatively low values (off-margin bidders) can become disinterested in Vickrey auctions; because they quickly learn that, they will not win. The participants then fall out of the auction or simply submit a zero bid. With the BDM mechanism, every participant has the opportunity to "win" but there is no active market, as it can be employed on an individual level. The random nth –price auction overcomes these issues.

Shogren formally introduced this auction mechanism in 2001 (Shogren et al., 2001b). This auction mechanism attempts to engage each and every bidder by incorporating the best characteristics and features of the Vickrey and BDM auctions – a random but endogenously determined market-clearing price. The randomness keeps all participants involved in the auction and reduces their incentive to fixate on a stable market-clearing price. The endogeneity guarantees that the market-clearing value retains some relation to the participants' bids (Shogren et al., 2001a).

The random n^{th} –price auction works as follows; participants simultaneously submit sealed bids for a good. The bids are collected and sorted in order from highest to lowest. The

monitor then draws a random number (*n*) which will be uniformly distributed between two (2) and *k* (with *k* being the number of bidders). The monitor will sell one unit of the good to each of the (*n*-1) highest bidders at the price equal to that of the n^{th} bid (Shogren et al., 2001b). It is important to note that the distribution starts from two (2) to *k* and not 1 to *k*. If the distribution were from one (1) and the monitor draws *n* = 1, there would be no winners in the auction as the winners are equalled to *n* – 1 (which in this case would equal zero). Further, it is important to take note that the random number *n* being drawn is a position and not the actual payment price. The price is equal to the bid of the n^{th} position. For example, a random n^{th} –price auction is held with 23 participants (k = 23). The participants' place their sealed bids for the auctioned product. The bids are collected and ordered from highest to lowest bid value. The monitor then draws a random number from the distribution between 2 and k (thus 2 to 23). If the random number drawn by the monitor is, for example, *n* = 7, the 6 (*n*-1 = 7-1 = 6) highest bidders will each "win" and purchase one unit of the good at the price equal to the seventh (n^{th} bid value) highest bid.

Shogren et al. (2001b) showed that each participant has an equal chance of winning the auction because the market-clearing price is determined endogenously. The random n^{th} – price auction is demand revealing due to its ability to engage all bidders, even those who have low preferences for goods (Shogren et al., 2001a). The fact that the price is randomly determined ensures that all participants are involved, while the endogenous price assures that the price, which the winners will pay, is in line with the true value the participants attach to the product.

3.9.4 Summary of the incentive compatible auction mechanisms

From the previous sections, it is quite clear that all three of the mechanisms have demand revealing properties and offer participants an incentive to reveal their true WTP value. Some of the prominent disadvantages of the Vickrey auction is that participants are likely to overbid, and the mechanism does not include low-value off-margin bidders. The BDM mechanism on the other end of the spectrum offers a solution through the randomly drawn purchase price. This price, however, is drawn from a predetermined distribution of prices, which if made known to the participants, could influence their bidding behaviour. The price

drawn in the BDM auction is therefore not endogenously determined and not directly connected to the participants. The random n^{th} –price auction offers a best-of-both-worlds solution. A detailed summary of the auction types is given in Table 3.2.

Table 3.2: Summary of incentive compatible auction mechanisms

Auction attributes	Vickrey Auction	BDM Auction	Random n^{th} –Price Auction
Participant procedure	Bids are submitted simultaneously.	Bids are submitted simultaneously.	Bids are submitted simultaneously.
Winning bidder	Highest bidder.	All participants with bids greater than the randomly drawn price.	All participants with bids greater than the randomly drawn n^{th} bid.
Number of winners	1	0 to all participants	n - 1
Market price	Second highest bid.	Randomly drawn price.	n^{th} highest bid.
Advantages	Easy to explain and implement. Only one unit the good is sold – easier preparation.	Implementable at the individual level. Quick elicitation process.	All bidders are engaged in multiple bidding rounds. Endogenously determined market price.
Disadvantages	Participants overbid. Low-value bidders fall out after multiple bidding rounds.	No active market. Revealing price distribution can influence behaviour.	Difficult to explain to participants. Time intensive if group sizes are large.

Source: Adapted from Lusk, 2003; Lusk, Feldkamp & Schroeder, 2004.

3.9.5 Application of experimental auctions

Using experimental auctions to elicit consumers' demand and WTP for food safety and quality is a natural fit for agricultural economists because of their interest in applied issues and their concern with using methods, which are consistent with economic theory (Lusk, 2003). In this section, the application of experimental auctions in the field of agricultural economics is discussed through examples of previous studies. Most of the studies relevant to this research made use of Vickrey and BDM auction mechanisms, but this can probably be attributed to the fact that the random n^{th}-price auction is relatively new in the world of experimental economics. All studies summarised in Table 3.3 investigated the impact of information on consumers' WTP for food or meat products. From the seven studies' results, the random n^{th}-price auction was selected as the best method to use in this study.

Table 3.3: Application of experimental auction methods

Authors	Focus	Mechanism applied	Main Results
Melton, Huffman, Shogren & Fox (1996)	The study illustrates the application of experimental auctions by evaluating consumer perceptions and WTP for fresh pork chops.	Vickrey auction	The results showed that the visual attributes of the meat matters. The presentation format of meat matters and impact the WTP for first-time buyers. Repeat purchasers are more affected by taste.
Napolitano, Braghieri, Piasentier, Favotto, Naspetti & Zanoli (2010)	The study was aimed to assess the effect of information about the organic production of beef on the liking and WTP of consumers.	Vickrey auction	The study found that the main limitation to the purchase of organic meat is the price. The results showed that information about the production process did influence the WTP and consumers are willing to spend more for organic meat when reliable information is supplied.
Liaukonyte, Streletskaya, Kaiser & Rickard (2013)	The study investigates the impact of labels and secondary information on the WTP for foods that use various ingredients and production processes.	BDM auction mechanism	It was found that labels and accompanying secondary information have a significant impact on WTP and the probability of refusal to buy at any price. The results showed that consumers benefit from the secondary information.
Liaukonyte, Streletskaya & Kaiser (2015)	The study examines the effect of information about product labels on WTP over time.	BDM auction mechanism	The results suggest that the adverse effect of negative information does not persist over time. In the case of positive information, it was found that there was no statistical difference in the WTP over time.
Cunningham (2003)	This study focused on the impact of information about bison products on consumers' WTP. Three information treatments were given: Nutritional information, information about the taste and information about the production process.	Random n^{th} – price auction	The study's results showed that the information on nutrition did not have a significant impact on the WTP and the main hypothesis of the thesis was rejected. The results of the impact of information about taste and production processes were not statistically significant. ANOVA analysis indicated that there were no statistically significant differences between the mean differences in the bids of the three information treatments.
Huffman, Shogren, Rousu & Tegene (2003)	Some groups advocate mandatory labelling of genetically modified (GM) products, while other groups oppose the labelling of these foods. This study used experimental economics to examine how WTP changes when GM labels are introduced.	Random n^{th} – price auction	The study demonstrated that the WTP decreased when the label indicated that the food product is GM. Consumers were willing to pay a 14% premium for food items perceived to be non-GM.
Umberger, Feuz, Calkins & Sitz (2003)	WTP for country of origin labelling were elicited from American-consumers. The participants were asked to evaluate two packaged beefsteaks visually. The only difference between the packs was that one pack was labelled while the second pack had no labelling.	Random n^{th} – price auction	The results indicated that 73% of the participants were willing to pay a premium of 11% for the steak with country of origin labelling on the packs and a premium of 19% for steaks with labels guaranteeing that the product was born and raised in the US.

3.10 Summary

The first part of this chapter was dedicated to a detailed discussion of revealed and stated preference methods employed to elicit WTP estimates for food quality cues and attributes. The different techniques of each method were evaluated. The application of revealed and stated preferences methods used in studies of specifically food and meat research were summarised in Table 3.1. From the literature reviewed, revealed preference methods were mostly applied in research within the transportation and environmental fields, while stated preference methods were employed when actual market data are not available. Stated preference techniques are mainly used to assess consumers' true values for food products with enhanced quality cues and attributes. The stated preference contingent valuation technique was selected as the most appropriate technique to use for research within this study. Contingent valuation has the ability to create a market where no actual transaction occurs, while directly determining the participants' true preferences. This method was employed in a supplementary study to the main experimental auction used to elicit South African consumers' WTP for differentiated fresh lamb meat products.

In the second part of Chapter Three, the fundamental building blocks of experimental auctions were discussed. This was followed by an in-depth discussion about the three widely used demand revealing auction mechanisms: Vickrey's second price auction, Becker-DeGroot-Marschak and the random n^{th} -price auction. The random n^{th} -price auction mechanism was found to be the best auction mechanism to use in determining South African consumers' WTP with regard to the purpose of this study. The random n^{th} -price auction is superior to stated preference methods, as well as the Vickrey and BDM auction mechanisms for two main reasons. First, the random n^{th} -price auction creates a market where actual transactions occur. Secondly, the random n^{th} -price auction mechanism combines the main features of the Vickrey and BDM auction mechanisms through engaging all bidders in bidding truthfully, as there is a reasonable chance that any participant might win. A summary of relevant WTP studies wherein experimental auctions was used as an elicitation method was given in Table 3.3.

Chapter Four

Experimental auction - design and procedure

4.1 Introduction

Chapter Three explored the three auction mechanisms used in experimental economics. Through experimental auctions, a market situation can be created to effectively elicit consumers' WTP for meat and its differentiated attributes. Advantages of such a hypothetical setting are the ease of applying and executing the experiment and the ability to control variables. Most auction mechanisms are incentive compatible and designed to reveal participants' true WTP values. Following a proper review of the literature, the random n^{th}-price auction was selected for the purpose of this study. The random n^{th}-price auction is designed in such a manner to create a market with real products where real money is exchanged for the products being auctioned (Lusk et al., 2004). Furthermore, the random n^{th}-price auction engages all bidders to bid truthfully, through combining the best elements of the Vickrey and BDM auction mechanisms, resulting in a mechanism with a random but endogenously determined market clearing (payment price) price. This endogenous payment price guarantees to preserve some relation to the participants' private values for the auction-good (Shogren et al., 2001b). Additionally, randomness increases the positive probability of each participant of becoming an auction winner and reduces any motivation to fixate on a stable market-clearing price.

From the random n^{th}-price auction mechanism's advantages, it was evident to use this specific auction mechanism to measure the impact of secondary information about differentiated fresh lamb meat products on SA consumers' WTP. The experimental part of the study was done in two ways: a physical random n^{th}-price auction was held, and an online contingent valuation questionnaire was sent out via email as an ancillary to the auction. The physical random n^{th}-price auction was employed in combination with pre- and post-auction surveys to capture the participants' demographic characteristics, purchase behaviour, and prior knowledge about lamb meat production processes. In order to acquire the participants' private values, without any external influences, for the lamb meat

products, no additional information about the lamb meat products for the auction was provided before the pre-auction survey. As mentioned, in addition to the physical auction held, an online equivalent was created. This was done to reach a wider range of participants (within the identified LSM groups).

The online participants were shown photos of the actual packets of lamb loin chops that were up for auction on the physical auction day. The same participants were contacted three months later to take part in the second set of online auction rounds and the post-auction survey. All participants remained anonymous.

To maintain the authenticity of the market environment, no initial endowment was given to the participants. Ding, Grewal, and Liechty (2005) stated that paying consumers some money for participating in a research study is not salient, because there is no relationship between the consumers' response and actions, and the money they receive. Through providing an initial endowment or reward, there is no reason to expect that the participants' behaviour during the experiment will be a true reflection of their behaviour during a similar real-world, economic activity. When respondents are held accountable for the decisions they made, their actions will more accurately predict purchases.

The lamb meat products used in this research case study were loin chops produced by means of Free-Range, Natural, Region-of-Origin and Generic production processes. All brand-specific labels and packaging were removed to ensure that the loin chops are not identifiable by any marketing characteristics. All chops were identically repacked and labelled with only the production processes (Free-Range, Natural, Region-of-Origin and Generic) indicated on the packs.

Furthermore, the impact of secondary information on consumers' bidding behaviour and WTP was measured before, immediately after, and three months after information was given to the participants. The different packets of lamb loin chops were shown to the participants where after all the participants wrote down their true WTP value for each packet. After the first set of bidding (each set consisted of one practice and four official bidding rounds), positive secondary information about the production processes of the

lamb loin chops was presented to the participants, whereafter the second set of bidding took place. Three months after the first auction day, a second day of auction took place, with the same participants as the first time. The participants took part in a set of bidding after which they completed a post-auction survey. During this auction procedure, the participants did not receive any positive secondary information. This was done to determine if the positive secondary information had any effect on their WTP or purchasing patterns over the three-month period.

Through using a contingent valuation questionnaire for the online participants, the WTP before, immediately after and three months after positive secondary information was provided to the participants could be measured. A similar procedure as the physical auction was followed. The only difference was that the respondents viewed photos of the packaged lamb meat. Their stated preferences were used to make inference about whether positive secondary information affects the WTP for the differentiated fresh lamb meat products.

The experiment was designed to measure consumers' WTP during the entire experiment. The WTP values elicited before, after and three months after secondary information was provided, made it possible to measure the impact of the secondary information on the consumers' bidding behaviour. In a South African context, it is difficult to measure a premium on fresh lamb meat products because it is already an expensive meat product. To verify this statement, the retail prices for differentiated fresh lamb loin chops were observed and noted. The observations were made at retailers and butcheries in Pretoria, Gauteng. This geographical area was chosen because it is the same area from which the target population were invited to participate. The specific retailers were chosen due to the fact that each retail store specifically supplies one of the four differentiated fresh lamb meat products. The average prices of differentiated fresh lamb loin chops are indicated in Table 4.1. These prices range from approximately R140/kg to R200/kg.

Table 4.1: Observed prices for differentiated fresh lamb loin chops

Butcher / Retailer	Price of differentiated lamb loin chops (R/kg)
Woolworths (Free-Range lamb and mutton)	R199.99/kg (€13.18/kg)
Checkers (Natural lamb and mutton)	R149.99/kg (€ 9.88/kg)
Spar (Generic lamb and mutton)	R169.99/kg (€ 11.21/kg)
Food Lovers' Market (Generic lamb and mutton)	R139.99/kg (€ 9.22/kg)
Boma Meat Market/Butchery (Region-of-Origin lamb and mutton)	R196.99/kg (€ 12.99/kg)

Source: Prices observed and noted during May-August, 2017. An exchange rate of R15.17/€ was used.

4.2 Experimental design

This study adopted an experimental auction and stated preference technique to determine the impact of secondary information on South African consumers' WTP for differentiated fresh lamb meat products. The physical experimental auctions for this research were conducted in May and August 2017 in Pretoria, Gauteng, South Africa. The contingent valuation questionnaires were also sent out during this time. The study and surveys used were approved by the University of Pretoria's board of ethics.

4.2.1 The sample

The participants for this study had to be consumers of lamb and mutton meat products. These participants are from households from the wealthier consumer segment groups, LSM 9 and 10, making them affluent enough to afford lamb and mutton meat products.

As mentioned before a typical sample size ideal for eliciting WTP values are depended on factors such as financial and time constraints. Furthermore, Lusk and Shogren (2007) stated that a sample size large enough to produce results, which are of statistical significance, would be preferred if the impact of information will be measured. In previous studies where the impact of information played an important role, a variety of sample sizes were used to conduct experimental auctions. In a Canadian study on the WTP for Bison products by Cunningham (2003) a sample size of 57 participants was used. In Van Zyl (2011) a sample of 31 participants was used for the experimental procedure. The study by

Liaukonyte, Streletskaya, Kaiser and Rickard (2013) on the impact of labels and secondary information on WTP had a sample size of 351 adult participants. While in the study by Liaukonyte, Streletskaya and Kaiser (2015) on the effect of information consumers' WTP over time, 110 participants participated of which 101 returned after three months.

This study has similar objectives as the studies referenced above and aimed for a sample of similar size. Due to financial and time constraints, however, the sample size for this research consisted of 15 auction participants and 36 online respondents. For the first physical auction day close to 100 people were invited to take part in the auction, with only 23 of them attending the auction. The day of the physical auction turned out to be one of the coldest autumn days in Pretoria (see Appendix E). Accumulated snowfall on the mountains in the central region of South Africa caused a cold front in Pretoria. This unusually cold and miserable weather, for the time of year, probably contributes to the low turnout of participants. Of the 23 original participants, only 15 returned for the follow-up auction day three months later. For the online contingent valuation, 124 participants started the online process, but only 36 participants completed both questionnaires entirely.

4.2.2 The questionnaires

The questionnaires were designed to identify the factors consumers regard as important during the process of purchasing fresh meat products. One of the main purposes of the questionnaires used in this research is to determine the participants' prior knowledge of production processes termed "Free-Range", "Natural", "Region-of-Origin", and "Generic". For this reason, direct, open-ended questions were asked. Furthermore, it was intended to gather as much information about the participants' purchasing behaviour of lamb and mutton meat products. The information was treated strictly confidential. Important survey questions included:

- Please use five descriptive words to explain what you think Free-Range (Natural, Generic, Region-of-Origin) lamb/mutton is
- Do you usually read food labels in the front of fresh meat packaging?

- Do you think there is enough information on fresh meat packaging?
- Did you believe the information that was provided about differentiated fresh lamb meat during the previous bidding exercise (three months ago)? Why or why not?
- Do you think fresh lamb meat products should be marketed Generically, as a homogenous meat category, or according to the differentiated claims, such as Free-Range, Karoo, Meat of Origin or Certified Natural?

It is important to note that the exact same questionnaires, which were used in the stated preference experiment, were used as part of pre- and post-auction surveys of the physical auction part of the study.

4.3 Experimental procedure: Random n^{th}-price auction

The procedure for the experimental auction component of the research consisted of two half-day experimental auctions, and a pre- and post-survey. The experimental procedures for both days are outlined in Table 4.2 with a detailed explanation for each stage of the experiment.

Upon arrival, the participants received pre-auction surveys, which they were requested to complete. The surveys consist of four sections of questions to elicit the needed data and home-grown values for Free-Range, Natural, Region-of-Origin and Generic production processes. Home-grown values are described by Lusk and Shogren (2007) as the values, which participants possess prior to the experimental stages of the research. These values are obtained through their own learning experiences in real-world situations.

Table 4.2: Outline of the experimental procedure

Stages	Description: Day one – auction sets A and B	Description: Day two – auction set C (three months later)
Stage 1	Participants receive information packs and surveys.	Participants receive information packs and surveys.
Stage 2	Pre-auction surveys are completed and taken in.	A verbal explanation of the random n^{th} – price auction is given with an example.
Stage 3	A verbal explanation of the random n^{th} – price auction is given with an example.	A practice round is done with bottled water.
Stage 4	A practice auction round is done with bottled water.	The four bidding rounds for Free-Range, Natural, Region-of-Origin, and Generic lamb loin chops are done. Bids are collected after each round.
Stage 5	The first four bidding rounds for Free-Range, Natural, Region-of-Origin, and Generic lamb loin chops are done. Bids are collected after each round.	A binding bidding round is randomly drawn, and the payment price is determined. The winning participants receive and pay for their packets of loin chops.
Stage 6	Positive secondary information about Free-Range, Natural, Region-of-Origin and Generic production processes is presented.	Post-auction surveys are completed and taken in.
Stage 7	The second four bidding rounds for Free-Range, Natural, Region-of-Origin, and Generic lamb loin chops are done. Bids are collected after each round.	
Stage 8	A binding auction set and bidding round is randomly drawn, and the payment price is determined. The winning participants receive and pay for their packets of loin chops.	

After completing the pre-auction surveys, the participants received an information pack (see Appendix A). The information provided explained the auction procedure through written instruction as well as how the participants' identification numbers for the auction is determined. These identification numbers were used to track WTP data and allowed the participants to remain anonymous.

The moderator gave participants verbal instructions on the experimental procedures based on the information and instructions from the information packs provided. The auction mechanism was explained through an example and practice round with bottled water. The practice round was conducted so that the participants could get comfortable with the auction procedure. The practice round aided in explaining to the participants that the best

strategy in an incentive compatible auction is to bid their personal true value for the auction product, and not to bid as they would in other markets.

The moderator explained that there would be two sets (A and B) with four bidding rounds (1-4) in each set. The first set of bidding rounds (A1, A2, A3, and A4) occurred to determine the participants' home-values; no information about the product or the production processes was given to the participants. The moderator continued to explain that after the first set of four bidding rounds (A1-A4), positive secondary information about each differentiated fresh lamb meat product's production process would be given to the participants. Immediately after the participants received the secondary information, the second auction set (B) would start. The participants would place their bids for each bidding round (B1, B2, B3, and B4). These bids (B1-B4) are considered to be an updated home-value, as it is based on their own knowledge and the information the participants received. Three months later a second auction will be held with one set of four bidding rounds. A step-by-step representation of the auction procedure is given in Table 4.3 followed by a detailed description.

Table 4.3: A summarised overview of the auction procedure

		Official bidding rounds:			
		Round 1	**Round 2**	**Round 3**	**Round 4**
Auction day 1:	**Bidding set A**	• Participants examine fresh Generic lamb loin chops. • Participants write down and submit their WTP value based on their home-values and prior knowledge about Generic lamb meat products. • All bids are collected before the next round (A2) starts.	• Participants examine fresh Free-Range lamb loin chops. • Participants write down and submit their WTP value based on their home-values and prior knowledge about Free-Range lamb meat products. • All bids are collected before the next round (A3) starts.	• Participants examine fresh Natural lamb loin chops. • Participants write down and submit their WTP value based on their home-values and prior knowledge about Natural lamb meat products. • All bids are collected before the next round (A4) starts.	• Participants examine fresh Region-of-Origin lamb loin chops. • Participants write down and submit their WTP value based on their home-values and prior knowledge about Region-of-Origin lamb meat products. • All bids are collected before the information session.
		Presentation of secondary information about each differentiated lamb meat product to the participants. Bidding set B starts immediately after the presentation.			
	Bidding set B	• Participants examine fresh Generic lamb loin chops. • Participants write down and submit their WTP value immediately after secondary information about Generic lamb meat products are presented. • All bids are collected before the next round (B2) starts.	• Participants examine fresh Free-Range lamb loin chops. • Participants write down and submit their WTP value immediately after secondary information about Free-Range lamb meat products are presented. • All bids are collected before the next round (B3) starts.	• Participants examine fresh Natural lamb loin chops. • Participants write down and submit their WTP value immediately after secondary information about Natural lamb meat products are presented. • All bids are collected before the next round (B4) starts.	• Participants examine fresh Region-of-Origin lamb loin chops. • Participants write down and submit their WTP value immediately after secondary information about Region-of-Origin lamb meat products are presented. • All bids are collected before the binding set, round and winners are determined.
Auction day 2:		**Three months after the first auction day, a second auction day will be held to measure the effect of information and time on the participants' WTP values.**			
	Bidding set C	• Participants examine fresh Generic lamb loin chops. • Participants write down and submit their WTP value based on their updated home-values and knowledge about Generic lamb meat products. • All bids are collected before the next round (C2) starts.	• Participants examine fresh Free-Range lamb loin chops. • Participants write down and submit their WTP value based on their updated home-values and knowledge about Free-Range lamb meat products. • All bids are collected before the next round (C3) starts.	• Participants examine fresh Natural lamb loin chops. • Participants write down and submit their WTP value based on their updated home-values and knowledge about Natural lamb meat products. • All bids are collected before the next round (C4) starts.	• Participants examine fresh Region-of-Origin lamb loin chops. • Participants write down and submit their WTP value based on their updated home-values and knowledge about Region-of-Origin lamb meat products. • All bids are collected before the binding set, round and winners are determined.

During each round, the identically packaged packets of lamb loin chops, marked only with a label indicating the production process, were shown to the participants. After visually examining the chops in each round, the participants placed their bids by writing down the value they were willing to pay for the specific packets.

After the first set of four bidding rounds (A1-A4) were completed, positive secondary information was presented to the participants. It is important to note that the information presented to the participants can be accessed on the website of the South African Meat Industry Company's (SAMIC) website. SAMIC is assigned by DAFF to ensure the application of sections 3(1) (a), (b), and Section 8 of the Agricultural Products Standards Act (no 119 of 1990) with regard to the classification and marketing of meat. Figure 4.1 shows the exact screenshots of the presentation of the information session.

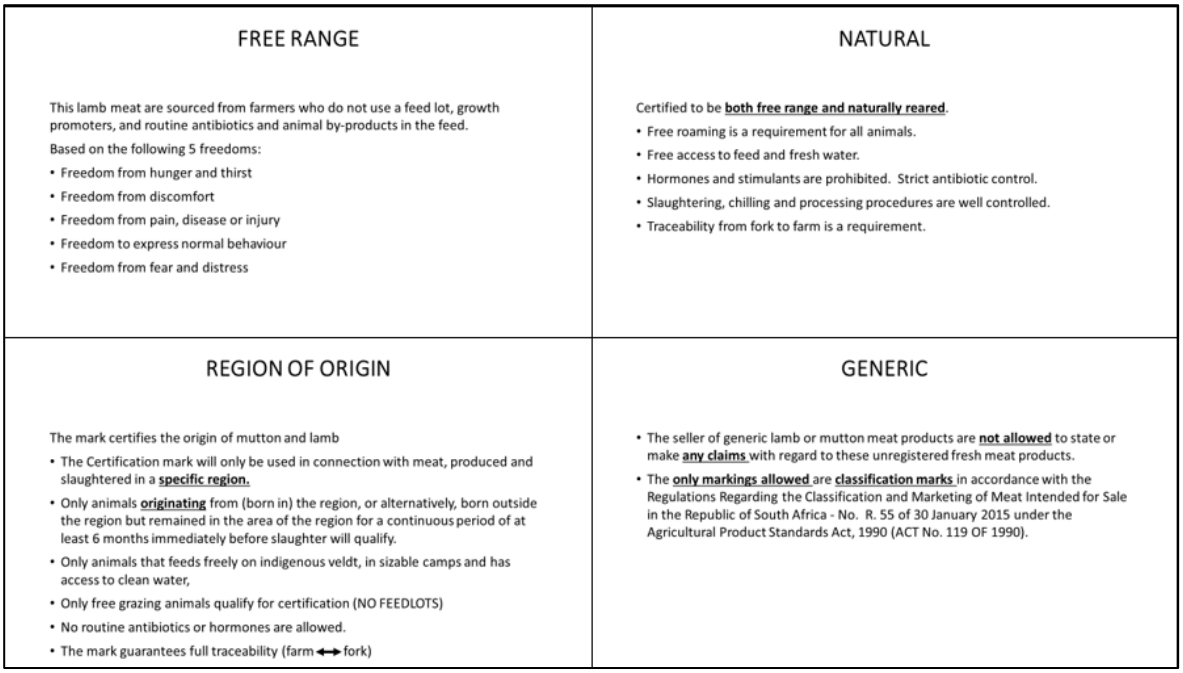

Figure 4.1: Information presentation slides
Source: SAMIC, 2016a, 2016b, 2016c; Department of Agriculture, 1990

A second set of four bidding rounds (B1-B4) were held after the participants were presented with the information mentioned above. The identically packaged packets of lamb loin chops marked only with a label indicating the production process were shown to the participants again. After looking at the chops, now with added information about the

production processes recently provided to them, the participants again placed their bids by writing down the value they were willing to pay for the specific fresh lamb meat products.

All the bids from set A and B were collected after each round (1-4) before the next round started. After collection, the bids were sorted from the highest to the lowest values. The bids from set A and B were kept separate. A random number between 1 and 2 (where a value of 1 = set A and 2 = set B) was generated in Excel to determine the binding set; the binding set was set A. After the set was determined, a binding bidding round from that set was randomly selected (round 1-4); binding round 1 from set A was randomly generated. The product, which was randomly selected as the product, which the participants won and pay for, was Generic lamb loin chops before the information, was presented. A random number (n) from the distribution {2; k, where k = 25} was generated to determine the cut-off position indicating the market clearing price at position n, which is the n^{th} bid value. The random n equal to four (n = 4) was generated in Excel, from the distribution {2; 25}. Therefore, with the random n equal to four, the three (n-1 = 4-1 = 3) highest bidders will each purchase one unit of the good at the price equal to the fourth (4^{th} = n^{th} bid value) highest bid. The three winners were identified, and each paid R85 for a packet of fresh Generic lamb loin chops.

After three months the procedure was repeated to measure whether time along with secondary information had an impact on WTP. The participants completed an auction set (set C) with four bidding rounds (C1-C4), without receiving any additional positive secondary information. No additional information or a repetition of the previous information provided was given. This was done to measure whether information had an impact on the respondents' WTP values over a three-month period. On completion of the auction procedure, all of the participants filled in a post-auction survey. After the surveys were collected, the winners had to be determined. As there was only one auction set for the day, this set (set C) was the binding auction set from which a binding bidding round had to be determined. Bidding round 4 was randomly determined, which meant the Region-of-Origin lamb loin chops were selected as the auction product.

A random number (n) from the distribution {2; k, where k = 15} was generated to determine the cut-off position indicating the market clearing price at position *n,* which is the n^{th} bid value. The random n equal to nine (n = 9) was generated in Excel, from the distribution {2; 15}. Therefore, with the random n equal to nine, the eight (n-1 = 9-1 = 8) highest bidders each purchased one unit of the good at the price equal to the eighth (8^{th} = n^{th} bid value) highest bid. The eight winners were identified, and each paid R62 for a packet of fresh Region-of-Origin lamb loin chops.

4.4 Summary

This chapter presented a very comprehensive discussion on the design and procedure of the methods employed during the data gathering process of this study. The chapter started with a brief overview of the random n^{th}-price auction and why it was chosen as the mechanism for this study. The second part of Chapter Three was dedicated to the experimental design and procedure, discussing the sample selection, questionnaire design and its analysis. The surveys were developed to collect data and information about the participants' decision-making processes, their *home-values* and prior knowledge as well as demographical information. This led to the third and final part of the chapter explaining the auction procedure, presented in eight stages in Table 4.2. The experimental auction component of this research was developed to conduct the random n^{th}-price auction to elicit true WTP values from the participants. The participants' WTP values were measured before, immediately after, and three months after positive secondary information was presented to them. The socio-economic profile, as well as new knowledge on lamb consumers' purchasing and consumption behaviour, will be discussed in Chapter Five.

Chapter Five

Profiling the product knowledge, and purchasing and consumption behaviour of South African lamb consumers

5.1 Introduction

This chapter is filled with interesting statistics and findings about the respondents' prior knowledge and their attitude towards new knowledge. Furthermore, the chapter will evaluate how the consumers valued and applied the secondary information presented to them. The discussions will be based on the results from the questionnaires the respondents completed (online, and pre- and post-auction). Their answers and opinions were used in quantitative and qualitative data analyses. The chapter is structured to follow the same sequence as that of the questionnaires.

This study has the unique opportunity to evaluate and compare the results of two samples of respondents; an online, and physical (face-to-face) sample. The questionnaires used were the same for both samples. The only difference is that the respondents of the physical sample went on to participate in a WTP experimental auction, while the online respondents completed a contingent valuation. To start the chapter off, the demographic profile of the participants will be analysed.

5.1.1 Data analysis: Questionnaires

Fisher's exact test

The demographic variables of the questionnaires were analysed using descriptive statistics and Fisher's exact test. The Fisher's exact test was specifically developed for exact inference on small samples, making it the perfect test to use for analysis in this study. The assumptions for Fisher's exact test are as follows:

- The sample was randomly drawn from the population
- Directional hypothesis is assumed - either positive or negative association is predicted, but not both
- The data is independent and not correlated
- A dichotomous measurement level of the variables is assumed

The Fisher's exact test tests the null hypothesis that the relative proportions of one variable are independent of a second variable. The p-value computed through Fisher's exact test can be compared to a specific level of significance to determine the independence of the two variables. All the Fisher's exact test analysis and other descriptive statistics were performed with the statistical package IBM SPSS Statistics 24 for Windows and Excel 2013.

Henry Garrett ranking technique

To determine which factors the respondents considered most to least important, when purchasing meat (red meat, and lamb and mutton respectively) the Henry Garrett ranking technique was used (Dhanavandan, 2016).
Following this method, the outcome of the respondents' ranked factors was converted into score values using the following formula:

$$Percent\ position = \frac{100(R_{ij} - 0.5)}{N_j}$$

Where

R_{ij} = Rank given for the i^{th} variable by j^{th} respondents

N_j = Number of variables ranked by j^{th} respondents

The per cent position is then converted into Garrett values with the help of Garrett's ranking conversion table. For each factor being ranked, the original rank value is then multiplied with the calculated Garret value and then summed to determine the total value. Each factor's average score is calculated. The average scores are then ranked to determine each factor's final overall rank. All calculations for the Garrett ranking technique were done in Excel.

Wilcoxon's signed-rank test

The respondents were asked to rank the same seven factors (quality cues and attributes) at two different times. The first time was before any secondary information was provided, while the second time was three months after the secondary information was presented to them. The first ranking occurred based on the participants' existing preferences for the seven specific cues and attributes. The second-ranking was done to determine if the provided secondary information about differentiated fresh lamb meat products had an impact on the cues and attributes the participants deemed important. The Wilcoxon signed-rank test was employed to calculate the difference (if any) in rank for each of the seven factors.

The Wilcoxon signed-rank test statistically compares the values of two dependent samples, or in other words, the two sets of scores (measured for the same factors) that come from the same participants at different times (Lund Research Ltd, 2013). The Wilcoxon signed-rank test is used to analyse any differences in scores from one time point to another, or when respondents are subjected to more than one condition. The Wilcoxon signed-rank test is a non-parametric statistical hypothesis test with the following assumptions:

- The dependent variable should be measured at the continuous or ordinal level
- The independent variable should consist of two categorical related groups or matched pairs
- The distribution of the differences between the related groups should be symmetrically shaped

The Wilcoxon signed-rank test tests the null hypothesis that the median differences between pairs (the change in rank) are equal to zero. The p-value computed through the Wilcoxon signed-rank test can be compared to a specific level of significance to determine if the difference measured in the dependent variable is statistically significant. All Wilcoxon signed-rank test analyses were performed through the statistical package IBM SPSS Statistics 24 for Windows.

5.1.2 Data analysis: Experimental auctions

Friedman's analysis of variance (ANOVA) along with Wilcoxon's signed ranks tests were applied to investigate whether there were any statistically significant differences in the mean values of the auction bids (WTP values). Friedman's ANOVA is the non-parametric equivalent of a one-way repeated measures ANOVA and is used in cases when the data does not meet the assumptions of a one-way repeated measures ANOVA. Because the WTP data for some of the products were not normally distributed and did not meet the assumption of sphericity, non-parametric tests were applied. The assumptions for Friedman's ANOVA are as follows:

- One group that is measured on three or more different occasions
- The group is a random sample from the population
- One dependent variable that is ordinal
- The samples do not need to be normally distributed

Friedman's ANOVA only reveals whether or not there is a significant statistical difference among the information treatments, but not exactly, where the difference occurs. To determine where the difference occurred, the Wilcoxon signed rank test was used.

All ANOVA and post-hoc tests were performed with the statistical package IBM SPSS Statistics 24 for Windows and Excel 2013.

5.2 Demographic information

The online and physical samples' demographic characteristics are summarised in Table 5.1. The demographic data was captured in the surveys sent out via email as well as in the pre-auction surveys on the auction day. The potential links between demographic variables and their responses are explained throughout the survey results.

Table 5.1: Sample demographics

Variable	Characteristics of the Sample	
	Online (n=36)	**Physical (n=15)**
Gender		
% Female	61 %	53 %
% Male	39 %	47 %
Age		
% 24-29 years	56 %	13 %
% 30-39 years	19 %	13 %
% 40-49 years	11 %	20 %
% 50-59 years	11 %	27 %
% 60 years and older	3 %	27 %
Education		
% Matric	6 %	20 %
% Technicon diploma	6 %	20 %
% Incomplete University degree	6 %	13 %
% Complete University degree	25 %	13 %
% Post-grad University degree	58 %	27 %
% Other post-matric qualification	0 %	7 %
Monthly Household Income		
< R 25 000	28 %	7 %
R 25 000 – R 29 999	8 %	13 %
R 30 000 – R 34 999	14 %	7 %
R 35 000 – R 39 999	6 %	20 %
R 40 000 – R 44 999	8 %	0 %
R 45 000 – R 49 999	3 %	7 %
> R 50 000	33 %	47 %
Average Household Size		
Average household size	2	2
Household size range (largest; smallest)	9;1	4;1
Geographical Distribution		
Gauteng	75 %	All participants (100%) lives in Pretoria, Gauteng.
North West	6 %	
Free State	8 %	
KwaZulu-Natal	6 %	
Eastern Cape	3 %	
Limpopo	3 %	

5.2.1 The online sample

The average household size for this sample was two people per household. The largest household in this sample was nine people, while the smallest was one. With 72% of the online sample's monthly household income being equal to or greater than R25 000, from Table 5.1 it is safe to conclude that the participants fall into LSM groups 7 – 10. According to SAARF (2014), the average household income for LSM 7-10 would be in the range of R12 789 to R40 337. Considering these SAARF measures for monthly household income, the samples of respondents is representative of the LSM 7 – 10 population. This is in line with the BFAP Baseline report (2017), which states that sheep meat is the most expensive meat option. This supports the decision that a wealthier sample was appropriate for this study.

The higher LSM groups, 7-10 are predominantly located in Gauteng, Western Cape and KwaZulu-Natal. The upper-middle-class consumers, LSM 7-8, in these provinces represent about 71% of the total upper-middle class consumers in South Africa, while the wealthy consumers, LSM 9-10 represents 79% of the total number of SA's wealthy consumers (Bureau for Food and Agricultural Policy, 2017). From the online sample, 75% of the participants are based in Gauteng.

For the online group of participants, 56% fell into the 24-29 years age group. Due to the relatively small sample sizes, it was decided to split the samples into two age categories. The age-range groupings of the participants were simply too big to use for the small sample size. By splitting the age groups into 24-29 years and 30 years and older, two similar sized groups were obtained for the online sample, improving statistical analysis.

5.2.2 The physical sample

When considering the physical auction's sample of participants' household income, 93% of the physical sample fall within the range of R12 789 to R40 337 or above it. The participants of the physical auction were also split into new age groups to improve statistical analysis. The new age groupings revealed that 87% of the physical auction participants are 30 years and older.

The average household size for the physical sample is two people per household. According to Statistics South Africa's Statistical Release Community Survey (2016), the average household size had decreased from 4,5 in 1996 to 3,3 in 2016. All of the participants in this sample reside in Gauteng, where the auction was held.

5.2.3 The Fisher's exact test results

As previously explained, the Fisher's exact test tests the null hypothesis that the relative proportions of one variable are independent of a second variable. The p-value computed through Fisher's exact test can be compared to a specific level of significance (significance level = 0.05) to determine the independence of the two variables. In Table 5.2 below the demographic variables were tested against one another to determine whether a dependency exists between for example income level and level of education achieved.

Table 5.2: Fisher's exact test statistics

Demographic Variables tested		**Online sample's Fisher's exact test statistic**	**Physical sample's Fisher's exact test statistic**
Gender:	Age	p-value = 0.447	p-value = 0.285
	Income level	p-value = 0.107	p-value = 1.000
	Education level	p-value = 0.586	p-value = 0.621
Age:	Income level	p-value = 0.232	p-value = 0.118
	Education level	p-value = 0.179	p-value = 0.056
Income level:	Education level	p-value = 0.450	p-value = 0.372

The Fisher's exact test was employed to measure if there exists any significant association between the demographic variables. None of the results indicated any statistically significant dependencies between the variables (all p-values > 0.05; Not rejecting H_0). In other words, all the demographic variables are independent of each other. The unexpected results of total independence might be due to the uniformity observed among participants in both samples.

5.3 Fresh meat purchasing and consumption behaviour

To analyse the meat (red meat, and lamb/mutton meat respectively) purchasing and consumption behaviour of the respondents, the participants were asked to indicate the following; place of purchase, consumption frequency and factors considered at purchase. These behavioural aspects were analysed to see if there are any purchase and consumption trends related to the respondents' bidding behaviour.

From Table 5.3 it is evident that the majority from both samples (58% of the online sample and 53% of the physical sample) consume red meat three to six days a week. For the same consumption frequency, only 8% of the online sample and 7% of the physical sample's respondents consume lamb and mutton three to six days of the week. Of the online sample, 36% consume lamb or mutton once to twice per week, while 33% enjoys lamb or mutton only twice a month. Compared to the physical sample's 27% and 40% for the same consumption frequencies, both samples' consumption of lamb and mutton is on average the same. The lower consumption frequency of sheep meat products for 3-6 days per week is justifiable within the South African consumer milieu, due to lamb and mutton being the most expensive red meat option.

The participants had to choose one outlet where they are most likely to purchase fresh meat. Butcheries are the top choice for purchasing red meat by the online participants with 42%, while 40% of the physical sample prefer Spar. Butcheries remain at the top spot for lamb and mutton for the online sample with 36%. Woolworths is a close competitor, while Checkers seems like the least favourite option for any fresh meat purchases.

Table 5.3: Fresh meat purchasing and consumption behaviour

Variable	Red Meat		Lamb and Mutton	
	Online (n=36)	Physical (n=15)	Online (n=36)	Physical (n=15)
Consumption frequency				
Every day	11 %	7 %	0 %	0 %
1-2 times per week	28 %	40 %	36 %	27 %
3-6 times per week	58 %	53 %	8 %	7 %
Twice a month	3 %	0 %	33 %	40 %
Once a month	0 %	0 %	17 %	7 %
Less than once a month	0 %	0 %	6 %	20%
Outlet choice of purchase	42 %	3 %	36 %	27 %
Butchery	14 %	40 %	14 %	40 %
Spar	3 %	7 %	3 %	7 %
Checker	31 %	13 %	28 %	20 %
Woolworths	8 %	0 %	11 %	0 %
Pick ‘n Pay	3 %	7%	8 %	7 %
Other:				

The results from the purchase decision analysis about outlet choice are interesting, indicating that the respondents in both samples may not be sensitive to sheep meat prices. This could be attributed to the fact that lamb and mutton is already an expensive meat option. Butcheries and Woolworths are priced higher R/kg than other outlets (see Table 3.1 for prices). This might suggest that there are other perceptions associated with retail food outlets, which overpowers the possible concerns with prices.

5.4 Factors influencing purchasing behaviour for lamb and mutton

In this section of the questionnaire, participants were asked to evaluate and rank seven (7) factors in order of importance when purchasing lamb or mutton. The factors are; price/kg, brand, packaging, fat content/marbling, meat cut, production method, and region of production. In Table 5.4, the factors are ranked from most to least important. The Henry Garrett ranking method and Wilcoxon’s signed rank test were used to analyse the results statistically. It is important to note that the participants were asked to rank the factors before any positive secondary information was given and again three months after the positive secondary information was presented. This was done to determine whether

secondary information and time had an impact on the importance (rank) which the respondents attach to specific quality cues and attributes.

The hypothesis tested is:

H_0: The median difference between pairs is equal to zero (not statistically significant)

H_1: The median difference between pairs is not equal to zero (statistically significant)

Rejection rule: Reject H_0 when p-value < 0.05

Table 5.4: Ranked results of lamb and mutton purchasing factors

Online sample results	
Pre-information rank	**3 Months Post-inform rank**
1. Meat cut	1. Price/kg
2. Price/kg	2. Meat cut
3. Fat content/marbling	3. Fat content/marbling
4. Packaging	4. Packaging
5. Brand	5. Brand
6. Production method	6. Production method
7. Region of production	7. Region of production
Physical sample results	
Pre-information rank	**3 Months Post-inform rank**
1. Price/kg	1. Fat content/marbling
2. Meat cut	2. Price/kg
3. Fat content/marbling	3. Meat cut
4. Brand	4. Production method
5. Packaging	5. Region of production
6. Production method	6. Brand
7. Region of production	7. Packaging

From the results in Table 5.4, it is interesting that the top three characteristics for both samples remain the same pre- and post-information, while only the rank order changes. The three most important factors, which the participants consider when purchasing lamb or mutton, are price/kg, meat cut and fat content/marbling. The test statistics calculated for the online, and physical samples are given in Table 5.5 and Table 5.6 below.

Table 5.5: Wilcoxon signed-rank test statistics: Online sample

Wilcoxon signed-rank test statistics: Online sample							
	Price/kg	**Brand**	**Packaging**	**Fat content**	**Meat cut**	**Production method**	**Region of production**
Z -value	-1.936	-1.460	-1.024	-1.457	-2.587	-1.429	-0.754
p-value	0.053	0.144	0.306	0.145	0.010	0.153	0.451
Effect size	-0.23	-0.17	-0.12	-0.17	-0.30	-0.17	-0.09
Rejection rule: (p-value < 0.05)	Fail to reject H_0	Fail to reject H_0	Fail to reject H_0	Fail to reject H_0	Reject H_0	Fail to reject H_0	Fail to reject H_0

A Wilcoxon signed rank test showed that for the online sample the change in rank for meat cut from most important to second most important was statistically significant (Z = -2.587, p-value = 0.01, effect size = -0.30, which is considered to be a moderate change). The change in rank for price/kg (from second most important to important) is very close to the level of statistical significance with Z = -1.936, p-value = 0.053 and effect size = -0.23 (small change). These results show that providing consumers with positive secondary information has a significant impact on their decision-making when considering the importance of intrinsic and extrinsic meat quality characteristics and ques.

Table 5.6: Wilcoxon signed-rank test statistics: Physical sample

Wilcoxon signed-rank test statistics: Physical sample							
	Price/kg	**Brand**	**Packaging**	**Fat content**	**Meat cut**	**Production method**	**Region of production**
Z -value	-2.032	-0.582	-2.106	-1.238	-0.463	-2.615	-1.633
p-value	0.042	0.561	0.035	0.216	0.644	0.009	0.102
Effect size	-0.37	-0.11	-0.38	-0.23	-0.08	-0.48	-0.30
Rejection rule: (p-value < 0.05)	Reject H_0	Fail to reject H_0	Reject H_0	Fail to reject H_0	Fail to reject H_0	Reject H_0	Fail to reject H_0

The results for the physical sample showed a statistically significant difference in rank (pre- vs post-information) for price/kg from most important to second most important (Z = -2.032, p-value = 0.042 and effect size = -0.37, moderate). The change in rank for meat cut (from second to third most important) and fat content/marbling (from third to most important) was not statistically significant. The rank for packaging showed a statistically significant change from fifth to least important factor (Z = -2.106, p-value = 0.035 and effect size = -0.38.

Compared with the findings in section 5.3, it is interesting to see that although the participants chose to purchase lamb and mutton from butcheries and Woolworths, price/kg was the only factor for both samples, which changed rank over time. Another interesting result is the change in rank for production method in the physical sample. This jump in rank shows a statistically significant change from sixth to fourth most important factor ($Z = -2.615$, p-value = 0.009 and effect size = -0.48). The effect size for the production method factor's rank change is very close to -0.5, which is considered a large effect. This particular change in rank could indicate that the consumers retained the provided secondary information (about the production processes) and that the information had an impact on their decision-making process and subsequently their purchase choice.
The statistically significant changes in price/kg and production method could be a result from the secondary information provided to the participants.

The fact that this significant change only occurred within the physical sample of participants leaves room for further research and investigation. The method in which the information was presented to the consumers could contribute to whether the consumers believed the information presented to them. The respondents of the physical sample attended a presentation of the information where they were able to read and hear the secondary information. The online sample's respondents only read the information.

The respondents of both samples were asked in the survey, which they completed three months after being presented with secondary information, whether they believed the information presented to them. The physical sample's respondents showed greater trust in the secondary information presented to them, with 93% of the participants answering 'Yes'. The online sample's respondents were divided, with 72% answering 'Yes', and 8% saying 'No'.

5.5 Prior knowledge of differentiated lamb meat claims

One of the specific research objectives of this study is to discover whether consumers understand what is meant with the different claims attached to, or associated with differentiated fresh lamb meat products. To achieve this, participants were asked to use descriptive words to explain what they think Free-Range, Natural, Region-of-Origin and Generic lamb is. The data gathered in this part of the survey is vital to obtain an insight into the participants' home-values before the information session where the true definitions of all the claims mentioned above were presented. It is important to note that when interpreting the data about the respondents' prior knowledge; they were allowed to use up to five descriptive words to explain what they understand each claim to mean.

5.5.1 Results from the online sample

The top five descriptive words used by the online samples' participants to explain what each claim is are presented in Table 5.7 followed by a detailed description.

Table 5.7: How online participants describe differentiated claims

Online sample (n = 36)		
Claim	**Descriptive words**	**Frequency**
Free-Range	Not confined/grazing	58 %
	Grass-fed	28 %
	Less or no hormones/antibiotics	39 %
	Flavourful/Tasty/Tender	17 %
	No Feedlot	17 %
Natural	No hormones/antibiotics	58 %
	Grass-fed	31 %
	Flavourful/Tasty/Tender	14 %
	No idea	11 %
	Affordable	8 %
Region-of-Origin	Rearing region	53 %
	Geographical location	28 %
	Exclusive/Niche product	8 %
	Place of meat origin	6 %
	Different taste	6 %
Generic	No idea	36 %
	Artificial	22 %
	Feedlot	17 %
	No branding or classification	17 %
	Hormones	14 %

Free-Range lamb and mutton defined

The majority of the online sample (58%) have a good understanding that Free-Range implies that the animals are not confined, while only 17% knows that this means the animals are not in a feedlot. The respondents (39%) explained that the animals are not, or are at least less exposed to hormones and antibiotics. Of the sample, 17% believe that the meat of Free-Range animals is flavourful, tender and or tasty. The obvious elements of Free-Range seem to be known, while the sample is not familiar with the more specific details of the Free-Range definition. Overall, the prior knowledge of Free-Range lamb and mutton production seems to have a positive perception among consumers as the descriptions of their understanding of the production process are positive.

The information presented to the participants after they completed their explanations, summarises Free-Range lamb and mutton as meat sourced from farmers with good flock management. These farmers do not use a feedlot, growth promoters and routine antibiotics. They do not feed the animals any feed containing animal by-products. Production is based on the following freedoms; freedom from hunger and thirst, discomfort, pain, disease or injury, freedom to express normal behaviour and freedom from fear and distress (SAMIC, 2016a).

Natural lamb and mutton defined

The concept of Natural lamb and mutton seem to have caused some uncertainty among the online sample respondents, with 11% not knowing what it is, and taking a guess. On the other hand, 58% of the sample stated that no hormones and antibiotics are used. There was no description of the animals not being in feedlots; yet, 31% stated that the animals are grass-fed, a concept normally associated with free roaming animals. These results imply that at least 58% of the sample has a good idea what the Natural quality indication mark means.

Interestingly, 8% of the sample described this fresh meat product as affordable. This can be related back to Table 4.1, where Natural lamb and mutton are the second most affordable lamb and mutton option. However, this is surprising as only 3% of the participants indicated that they purchase lamb and mutton from Checkers (see Table 5.3). Unfortunately, the surveys did not directly ask the respondents if they know which retail store sells Natural lamb and mutton loin chops.

Region-of-Origin lamb and mutton defined

The sample described the Region-of-Origin production process with reference to a rearing region (53%), or geographical location (28%). This description of Region-of-Origin lamb and mutton is exactly on target, when compared to the official definition. The online sample continued to describe Region-of-Origin produced meat as an exclusive or niche product (8%) with a different taste (6%) relating to the geographical area of origin. In reference back to Table 4.1, Boma Meat Market is one of the only butcheries in Pretoria, Gauteng, which sells Region-of-Origin lamb and mutton. The exclusivity of the product could be related to the product being the second most expensive lamb and mutton option of the four differentiated claims.

Generic lamb and mutton defined

Meat produced using no specific or stated production process is termed Generic with no visible labelling or wording about the production process on the meat packaging. From the survey results, the assumption is made that the participants connect the word Generic with something that is not real. A total of 36% of the online sample, did not know what Generic lamb and mutton are, while 22% described it as artificial or a vegetarian substitute.
Only 17% stated that feedlots are used in production, with no branding. The use of hormones in the production process was stated by 14% of the respondents.

5.5.2 Results from the physical sample

Table 5.8 presents the physical sample's result with a detailed description of the prior knowledge descriptions and definitions for each differentiated claim.

Free-Range lamb and mutton defined

The physical auction participants seemed to be more familiar with detailed descriptive words such as natural (40% of the sample), not feedlot (67%), and no hormones (20%). This sample also described Free-Range meat to be healthy. Of this sample, 73% of the respondents used veld grazing or grass-fed to describe Free-Range.

Table 5.8: How physical participants describe differentiated claims

Physical sample (n = 15)		
Claim	**Descriptive words**	**Frequency**
Free-Range	Veld[4] grazing/Grass-fed	73 %
	Not feedlot	67 %
	Natural	40 %
	Healthy	33 %
	No hormones	20 %
Natural	Not feedlot	33 %
	Natural feed	33 %
	Healthy	27 %
	No additives	20 %
	No medicines/stimulants	20 %
Region-of-Origin	Specific area	80 %
	Area unique characteristics	40 %
	Area unique production	33 %
	Natural	13 %
	Tasty	7 %
Generic	Feedlot	47 %
	Hormones	33 %
	No standardisation	13 %
	No idea	13 %
	Unnatural	13 %
	Low Price	13 %

[4] Alternatively, veldt is open, uncultivated grassland in South Africa bearing grass, bushes, or shrubs.

Natural lamb and mutton defined

Natural lamb claims to be certified as both free-range and naturally reared. This means the animals are free to roam, have free access to feed, and are not treated with hormones and stimulants. Strict antibiotic control is a requirement and all withdrawal periods must be adhered to. The slaughtering, chilling and processing procedures are well controlled, and traceability from fork to farm is a requirement (SAMIC, 2016c).

The physical sample described Natural lamb and mutton as animals not in feedlots (33%) feeding on Natural feed (33%) and being healthy (27%). This sample of respondents once again showed more familiarity with detailed descriptions of the claim, compared to the online sample. Both samples have a relatively positive attitude when describing Natural produced lamb and mutton.

Region-of-Origin lamb and mutton defined

The physical sample described the Region-of-Origin production process concerning a specific area of production (80%). The sample also views this lamb and mutton as meat with area unique characteristics (40%) and production methods (33%) but did not elaborate on what these characteristics are. Respectively 13% and 7% of the sample described the meat as natural and tasty.

Neither the online nor the physical sample referred to the animals used for producing differentiated lamb and mutton products. The fact that the animals used for the production of Region-of-Origin lamb and mutton need to originate from the region, or alternatively, have been in the region for at least six months immediately before being slaughtered is central to the Region-of-Origin claim. The probability that the respondents did not have enough prior knowledge to describe the product cannot be ruled out. The term Region-of-Origin is in a sense self-explanatory.

Overall, both samples showed greater uncertainty with the description of meat from a Region-of-Origin production method, compared with Free-Range and Natural. Less descriptive words were used to communicate their perceptions, but the overall view is positive. In a previous study (Van Zyl, 2011) there was a slight negative perception about the taste of Region-of-Origin meat, which was not evident among this study's respondents.

Generic lamb and mutton defined

The physical sample showed greater insight with 47% using feedlots to describe the production process, although Generic does not mean feedlots are exclusively used in production. The assumption of hormone use was made by 33% of the sample, while 13% stated that there are no measurable standards in the production of Generic lamb and mutton to which a producer must comply. The terms unnatural and low price (indicating a cheaper alternative to differentiated products) was used by 13% of the respondents.

The overall description received from participants (based on their home-values) is more negatively framed than that of Free-Range, Natural and Region-of-Origin. The quality level of Generic lamb and mutton products seems to be the consumers' main concern. This could be as a result of the lack of production information available at the point of purchase about the processes employed. This negative attitude, which the respondents have towards Generic lamb and mutton might indicate to producers and marketers that there is a need for positive secondary information about production processes and quality claims.
The physical sample showed greater insight with 47% using feedlots to describe the production process, although Generic does not mean feedlots are exclusively used in production. The assumption of hormone use was made by 33% of the sample, while 13% stated that there are no measurable standards in the production of Generic lamb and mutton to which a producer must comply. The terms unnatural and low price (indicating a cheaper alternative to differentiated products) was used by 13% of the respondents.

The overall description received from participants (based on their home-values) is more negatively framed than that of Free-Range, Natural and Region-of-Origin. This might indicate to producers and marketers that there is a need for information, which supports

the idea that fresh (lamb and mutton) meat products should be marketed under differentiated claims.

The following section provides insight to the respondents' opinions on existing information on fresh meat packaging, the change in their purchase behaviour, as well as their thoughts about the current marketing strategies employed in retail food stores. The idea that fresh (lamb and mutton) meat products should be marketed under differentiated claims became evident in this section of the survey results, based on the respondents' prior knowledge.

5.6 Information about fresh meat labelling

Liaukonyte, Streletskaya, Kaiser and Rickard (2013) found that the primary labels and the content of secondary information have a significant impact on WTP. In the last sections of the post-auction surveys (three months after the secondary information was provided), some of the questions the respondents were asked was to indicate whether or not there is enough information on the packaging of fresh meat products. Respondents were directly asked what information they would like to see on packaging and how they think fresh lamb meat should be marketed.

5.6.1 The value of labels

The results of the first question about labels and whether the participants usually read food labels on the front of fresh meat packaging is presented in Table 5.9 and discussed below.

Table 5.9: Percentage of respondents who reads food labels on fresh meat packaging

	Online sample respondents	**Physical sample respondents**
Yes	39%	47%
No	17%	0%
Sometimes	44%	53%

Online sample's results

A total of 39% of the online samples' participants indicated that they always read labels, while 44% only 'Sometimes' read the labels on the front of fresh meat packaging. The participants who answered 'Yes' were asked to explain their response by indicating the three things they notice on the labels. Price (43%), branding (100%) and use by dates (50%), along with unique attributes or ingredients (57%) were among the top stated information searched for on labels.

The group which only 'Sometimes' read labels, only search for information, when something about the meat's intrinsic quality cues (fat content, meat cut or colour) did not look appealing (50% of respondents), or when something changes the norm they are used to (44%). This change might be a different or unique packaging that caught their eye, or they simply had to purchase the meat from a different place than their usual preferred retail store or butchery. The remaining participants who did not read labels (17%) stated that they trust the retailer from which they purchase the meat and regarded it as time-consuming to read the labels.

Physical sample's results

Out of the 15 participants, only seven (47%) answered 'Yes' to reading the labels on fresh meat packaging. Of the 47%, 86% notice unique attributes about the product and packaging. From this sample, 80% of the respondents always search for price, regardless of their answer. The half of the participants who answered 'Sometimes' read labels only when they have enough time to do so.

5.6.2 The need for information on packaging

Question two directly asked the participants if they think there is enough information on fresh meat packaging. The respondents were required to indicate what important

information they would like to see if they answered 'No'. The results are presented in Table 5.10.

Table 5.10: Percentage of respondents that think there is enough information on fresh meat packaging

	Online sample respondents	Physical sample respondents
Yes	47%	60%
No	53%	40%

The results obtained from this question was 53% answering 'No', there is not enough information, while 47% regarded the current information as sufficient. Interesting reasons were given for wanting more information provided on the labels.

Of the participants that answered 'No', 63% indicated that they wanted information elements on the packaging which are already there; Information such as differentiated claims, dates and nutritional information. From this, it can be reasoned that the consumers do not read the labels, or they simply do not understand the primary information. Respondents (43%) requested that the origin of the meat should be indicated (regardless of the differentiated claim) on the packaging. In other words, the province and or the region within the province where the animals were reared should be indicated on the packet. Knowing more about the feed, diet and supplement composition was important to 21% of the respondents. These consumers want to know what the animals where specifically fed, for example; grass-fed or grain-fed and if antibiotics were used. Another interesting result from this particular group (21%) of respondents is the request that the grade and classification of the meat to be visible on the front-of-pack labels. From the explanations given, it is clear that the consumers do not understand this classification and grading roller marks on the meat itself. The respondents made statements like "some indication of the difference in grades", and "reasons for the ink colours on the fat".

The distribution of the physical sample's results for this question closely follows that of the online sample's results. Of the sample, 60% answered 'No' and indicated that they want more information on the labels. Once again some of the respondents requested information elements, which are already indicated on the labels. Elements such as claims,

origin and grade/classification were requested by 78%, 44% and 22% of the respondents. From the reasons given it is evident that the consumers are still unsure about the differences in the differentiated claims.

5.6.3 Respondents' purchase decisions

Question three evaluated the respondents' own opinion about their home-values about the differentiated claims before they participated in this study. Table 5.11 contains the percentage of each sample's participants' own evaluation of their prior knowledge about differentiated claims.

Table 5.11: Percentage of participants feeling familiar with differentiated claims before participating in the study

	Online sample respondents	Physical sample respondents
Very familiar	8%	7%
Somewhat familiar	56%	53%
Not familiar	36%	40%

A low total of 8% of the online participants were 'Very Familiar' with the claims and the differences between the claims, while 56% were 'Somewhat Familiar'. The remaining 36% feel they were not familiar with the claims or the differences between the claims. Viewed differently, this translates to 92% of the participating consumers not being confident with their own values of their prior knowledge before participating in the study. When these results are compared with their ability to describe what they think each claim means (see Table 4.7), it can to some extent be inferred that the respondents underestimated their home-values (knowledge before participating). The participants do however feel that the information currently provided by the front-of-pack labels (primary information source) are not sufficient to their information needs. This is reflected in the physical sample's results as well.

The results obtained from the physical sample once again closely follow the online sample's results, with only 7% of the respondents being 'Very Familiar' with the differentiated

claims. The majority of the sample (53%) is 'Somewhat familiar', while 40% is not familiar with the details about the claims.

In question four the respondents were asked to state if their home-values where updated since their initial participation in the study (three months before). Table 5.12 shows the percentage of participants who experience some or no change in their decision-making process for fresh lamb meat products. It is important to note that this is the respondents own reflection on their personal experience (purchasing behaviour) to the change in their decision-making process when it comes to fresh lamb meat.

Table 5.12: Percentage of participants that noticed a change in their decision-making process for fresh lamb and mutton

	Online sample respondents	Physical sample respondents
No change	53%	6%
Slight change	44%	47%
Big change	3%	47%

From all the online participants, more than half (53%) claimed they did not experience any change in their purchase decisions. The main reasons given for no change in their purchase behaviour is based on personal preference. One participant stated that even when the differences in the claims are considered, the decision to purchase the product depends "entirely on the price and overall appearance of the meat" rather than the guarantee of the product being Free-Range, Natural, Region-of-Origin or Generic. Only 3% of the respondents experienced a 'Big change', explaining that they are now more informed and aware of what they are actually purchasing.

The majority of explanations given by the respondents, who in some way experienced change, indicated that the secondary information provided did make them more aware of the information on the labels because they had a better understanding of the information (43%). Participants continued to explain that even though they might not remember what the exact differences between the claims are, they are still aware that there is a difference in the production processes. The purchase decision is, however, is still dependent on the price (72%).

The results obtained from the physical sample's respondents are interesting when compared to the results from the online sample. Only 6% of the respondents experienced 'No change', while 47% experienced 'Big change'. This may link back to the method in which the secondary information was presented to the respondents and whether they believed the secondary information about the different claims.

The respondents were asked directly asked if they think fresh lamb meat should be marketed generically, as a homogenous meat category, or according to the differentiated claims, such as Free-Range, Karoo Meat of Origin or Certified Natural? The results are given in Table 5.13 below.

Table 5.13: Marketing results

	Online sample respondents	**Physical sample respondents**
Generic (homogenous)	25%	0%
Differentiated	75%	100%

The interesting results from this opinion question show that 75% of the online sample's respondents indicated that fresh lamb meat should be marketed according to the differentiated claims. All of the respondents (100%) from the physical sample indicated that fresh lamb meat should be marketed according to differentiated claims.

These results coupled with all of the findings above paints a very interesting picture about the respondents' confidence in the primary information provided through labels, and their trust in secondary information. The majority of the respondents indicated that they want more information provided, but not all trusted this secondary information. The way in which the secondary information is presented might play a fundamental role in the respondents' ability to trust this information. Simply providing secondary information through an electronic medium, will not completely win over consumer trust. The respondents who read and heard the secondary information showed greater trust in this information. This trust updated their home-values and ultimately had an impact on their decision-making processes.

5.7 Summary

This very loaded chapter gave an overview of the different demographic variables of the respondents. These variables showed the composition of the two samples mainly consisted of educated females in the higher LSM 7-10 groups. Most of the online sample's respondents reside in Gauteng (75%), while 8% of the respondents live in the Free State, an area known for its agricultural activities. All of the respondents from the physical sample are from Pretoria in Gauteng. The Fisher's exact test results indicated there are no statistically significant associations between the demographic variables.

Purchase and consumption behavioural patterns were discussed. Interesting findings from this section where that 58% of the online sample and 53% of the physical sample consume red meat three (3) to six (6) times per week. On the other hand, for the same consumption frequency, only 8% of the online sample and 7% of the physical sample's respondents consume lamb and mutton meat frequently in a week. Respondents in the online sample indicated that butcheries (42%) are their outlet of choice for the purchase of red meat, while the physical sample's respondents preferred Spar. For lamb and mutton purchases, 36% of the online sample heads to the butchery, and 40% buy their lamb chops at Spar. Woolworths was revealed as the second outlet of choice for red meat purchases by both samples. The physical sample preferred butcheries over Woolworths for lamb and mutton purchases.

The respondents evaluated and ranked seven factors according to importance. The ranking was done twice; once before and then three months after secondary information was presented to them. The first set of results showed that the respondents considered meat cut, price/kg and the fat content as the three most important factors when they are making purchases decisions. Three months after secondary information was presented to them, the rank obtained indicated that the secondary information might have had an impact on the importance they attached to each factor. Linking these results with the outlet of choice suggests that the participants are not as price sensitive as they claim.

The overall home-values or prior knowledge about 'Free-Range', 'Natural' and 'Region-of-Origin', were positive, as described by the respondents. All the respondents from the physical sample and 75% of the online sample indicated that they thought fresh lamb and mutton should be marketed according to differentiated claims, rather than generically as a homogenous product.

Chapter Six will present and discuss the results from the experimental auction.

Chapter Six

Measuring lamb consumers' willingness to pay for differentiated fresh lamb meat products

6.1 Introduction

The complete experimental procedure and design are explained in Chapter 4. There were two bidding sets consisting of four rounds each on day one, and one bidding set of four rounds on day two, three months after the first sets. The first set measured consumers' WTP for differentiated fresh lamb meat products based on their home-values. The second set measured the WTP values immediately after the participants received positive secondary information about the differentiated fresh lamb meat products. The third set measured the WTP values three months after secondary information was presented to the participants. During the third set, the participants did not receive any information with the purpose to determine, whether or not the information given on the first day had been retained and had an effect on their initial home-values and their WTP. The online sample of respondents merely stated their WTP values in a contingent valuation, while the physical sample of respondents participated in an experimental auction. The random n^{th}-price auction was employed to elicit the WTP values for four (4) types of differentiated fresh lamb meat products; Free-Range, Natural, Region-of-Origin and Generic.

The results of the experimental auctions and the effect of positive secondary information on WTP will be discussed in this chapter. The important objectives namely to determine if consumers are willing to pay a premium for a product after positive secondary information about the differentiated products' quality cues and attributes are given; and if the consumers are still willing to pay that premium three months after the positive secondary information was given.

As previously explained, the WTP was measured at different points in time; WTP based on home-values, immediately and three-months after the secondary information was

presented. This was done to determine if the presented secondary information had an immediate and long-term impact on the consumers' home-values (prior knowledge). The percentage change in average WTP values for the differentiated fresh lamb meat products is presented in Table 6.1 below.

Table 6.1: Percentage change in average WTP values

Differentiated claims		**Information level**		
		% change from Pre to Post-information	**% change from Post to 3 Months Post-information**	**% change from Pre to 3 Months Post-information**
Free-Range	**Online**	8.8 %	-6.9 %	1.2 %
	Physical	9.7 %	-1.7 %	7.9 %
Natural	**Online**	10.1 %	-7.4 %	2.0 %
	Physical	14.8 %	3.3 %	18.5 %
Region-of-Origin	**Online**	2.5 %	-1.7 %	0.8 %
	Physical	4.3 %	-2.5 %	1.7 %
Generic	**Online**	-7.0 %	0.1 %	-6.9 %
	Physical	-16.0 %	13.3 %	-4.8 %

The average WTP measure for all products did change immediately after secondary information was presented to the participants (see % change from pre to post-information in Table 6.1). Although the change is negative, the biggest change occurred for the Generic lamb loin chops in the physical sample. The average WTP value dropped by 16% immediately after the positive secondary information about the product was presented. The inference from this change is that the value of the information has an immediate negative impact on the WTP values, even though the information is framed positively. Interestingly, the average WTP for Generic lamb increased by 13.3% when measured three months after the information was presented (see % change from Post to 3 Months Post-information in Table 6.1). The average change in the WTP value, from pre- to three months post -information for the Generic product within the physical sample was small (-4.8%) in comparison with the previous changes. This increase in the average WTP values indicates that the negative impact, which the positive secondary information had on the consumers, did not last in their memory, and did not have an impact on the physical sample's WTP for the Generic lamb loin chops. The comprehensive evaluation of whether any of the changes in Table 6.1 are of statistical significance is discussed in the remainder of Chapter Six.

6.2 WTP results

The results from the random n^{th}-price auction and the contingent valuation will be presented and discussed in this section. The online respondents simply had to state their WTP values based on photographs of the differentiated fresh lamb loin chops. The WTP values were recorded before, and immediately after they read secondary information about the differentiated products. Three months later, the same participants were asked to state their WTP values.

The first set of bidding rounds occurred without any additional information presented to the participants. The participants therefore only had their home-values based on prior knowledge to rely on for the first bidding set. After the first set, positive secondary information was presented to the participants where after they again submitted their WTP values (based on new knowledge). Three months later, a third set of bidding occurred, again without information, to measure the effect of the information on the WTP (updated home-values). The results obtained from the WTP analyses could unintentionally conclude if the participants retained the information presented to them three months earlier.

The results for each statistical analysis will be discussed for each differentiated claim, namely Free-Range, Natural, Region-of-Origin and Generic. Each claim has results from the online stated preference and physical auction. Therefore, the WTP results obtained from the physical and online experiments are discussed separately.

6.2.1 Average WTP values

The average WTP values given in Table 6.2 for the different auction groups gives a good indication of the effect additional positive secondary information had on the participants' WTP values. In Figure 6.1 the results from the physical sample are graphically presented to visually report the effect and impact of information on the average WTP.

Table 6.2: Average WTP values - Rand/500 g packets of differentiated lamb loin chops

Differentiated claim	Information level	Experiment sample	
		Online R/500 g	**Physical** R/500 g
Free-Range	Pre-info	87	67
	Post-info	95	74
	3 Months Post-info	88	72
Natural	Pre-info	82	62
	Post-info	90	71
	3 Months Post-info	83	74
Region-of-Origin	Pre-info	84	70
	Post-info	86	73
	3 Months Post-info	85	71
Generic	Pre-info	66	65
	Post-info	61.47	54
	3 Months Post-info	61.53	62

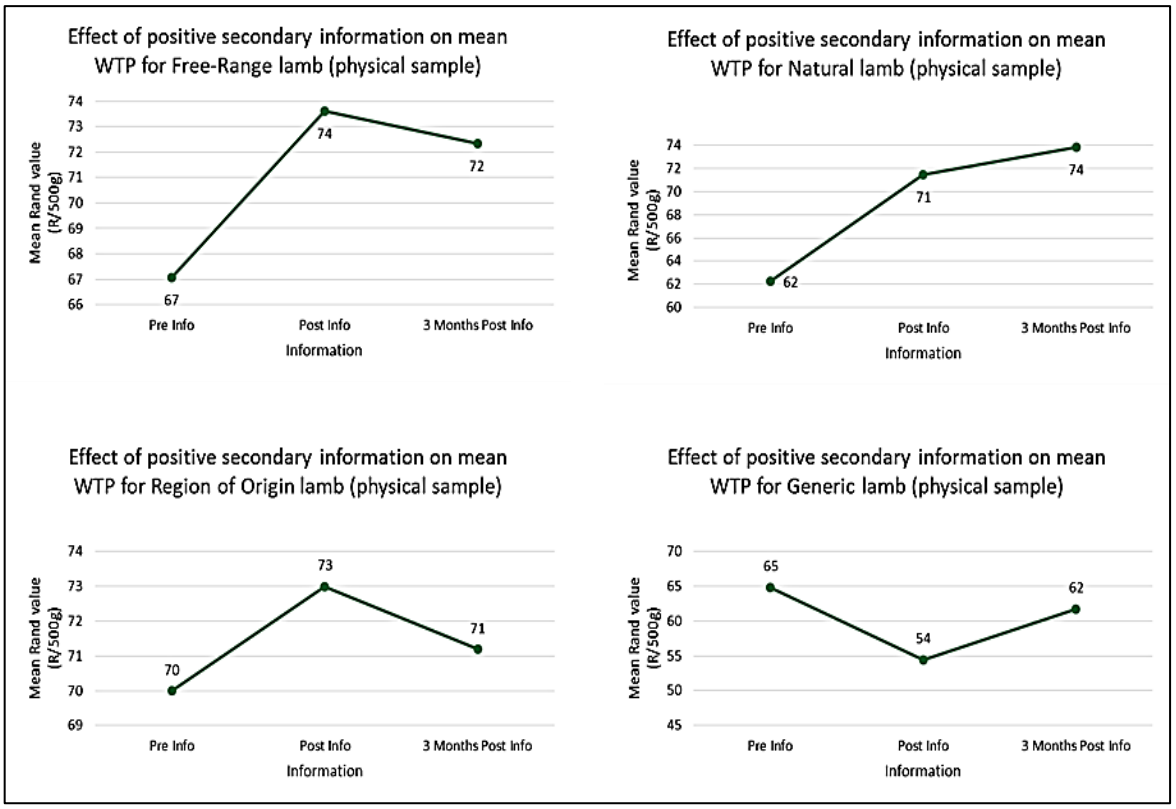

Figure 6.1: Effect of secondary information on the mean WTP - physical sample

The data in Table 6.2 and Figure 6.1 leads to the inference that once positive secondary information was presented to the participants, their immediate response to the information was more pronounced than the long-term impact. Free-Range (9.7%), Natural

(14.8%) and Region-of-Origin (4.3%) all showed a positive percentage change in the average WTP for the physical sample. The Generic lamb loin chops showed a negative change of 16%. This decline is a direct expression of the value the participants attached to the information they received, to update their home-values.

The results from the online stated preference experiments paint a similar picture as the physical sample's, following the same trend. The changes in average WTP values stated by the online respondents are visually depicted in Figure 6.2.

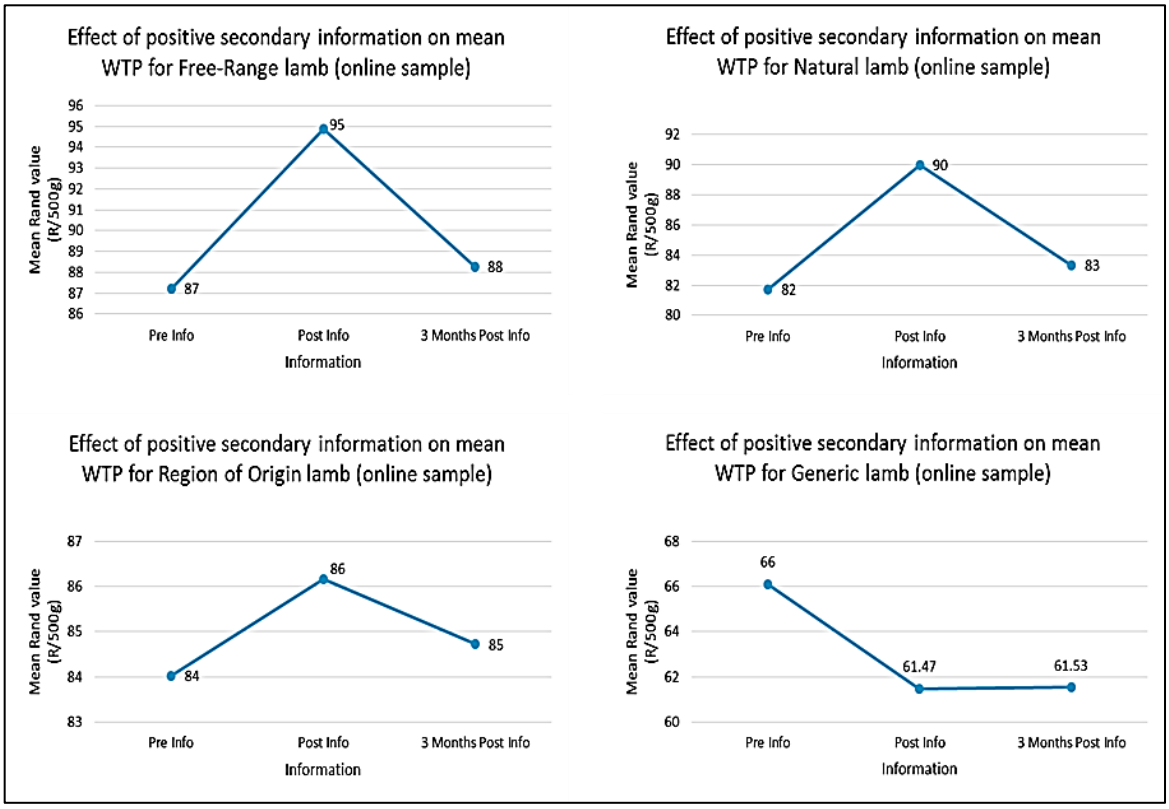

Figure 6.2: Effect of secondary information on the mean WTP - online sample

The same change trends observed in the physical sample's results occurred in the results of the online stated preference experiment. The WTP values stated, immediately after secondary information was presented, resulted in an increase in the mean WTP values. Free-Range (8.8%), Natural (10.1%) and Region-of-Origin (2.5%) showed a positive percentage change in the average WTP for the physical sample, while the Generic lamb loin chops showed a change of -7.0%.

This decline in the average WTP for Generic lamb chops could be attributed to the fact that the participants were made aware of the true meaning of Generic lamb. Even though the information provided was positive, their evaluation of the information updated their home-values. This update had a direct influence on their decisions, and this is reflected in the WTP values stated. The Rand value of the changes in the WTP values is summarised in Table 6.3[5].

Table 6.3: Rand/500 g change in WTP values

Differentiated claim	Information level	Experiment sample	
		Online R/500 g	**Physical** R/500 g
Free-Range	Pre-info to Post-info change	8	7
	Post-info to 3 Months Post-info change	-7	-2
	Pre-info to 3 Months Post-info change	1	5
Natural	Pre-info to Post-info change	8	9
	Post-info to 3 Months Post-info change	-7	3
	Pre-info to 3 Months Post-info change	1	12
Region-of-Origin	Pre-info to Post-info change	2	3
	Post-info to 3 Months Post-info change	-1	-2
	Pre-info to 3 Months Post-info change	1	1
Generic	Pre-info to Post-info change	-4.53	-11
	Post-info to 3 Months Post-info change	0.06	8
	Pre-info to 3 Months Post-info change	-4.47	-3

To determine whether these differences are statistically significant, Friedman's ANOVA was used to test the differences between the three levels of information. Friedman's ANOVA is a non-parametric test, which indicates whether or not there is a statistically significant difference between repeated measures over time. This means that this test looks at the pre-, post-, and 3 months post-information of each claim (as a group) to determine if there are statistical significances between information levels for each separate claim. From these results inference about the worth of the information can be made.

[5] An exchange rate of R15.17/€ was used for all conversions in the study.

6.2.2 Friedman's ANOVA results

Friedman's ANOVA evaluates whether or not there is a statistically significant difference among the WTP values of the different information levels. In other words, the WTP values of each claims' pre-, post- and three months post-information is statistically tested to determine if there is a significant difference among the information treatment's effects. The three pairwise comparisons of each claim in Table 6.4 only indicates that there is a difference, but not where the difference occurs (as in between pre- and post-information for example).

Table 6.4: Friedman's ANOVA results

Differentiated claim	Friedman's ANOVA	
	Auction groups	
	Online	Physical
Free-Range	p = 0.064*	p = 0.205
Natural	p = 0.104	p = 0.001**
Region-of-Origin	p = 0.717	p = 0.480
Generic	p = 0.051*	p = 0.144

* - Statistically significant at 0.07 ** - Statistically significant at 0.05

From Table 6.4, the Friedman's ANOVA statistics indicate that there are statistically significant differences between the three information levels for Free-Range in the online sample, for Natural in the physical sample, and for Generic in the online sample. The Region-of-Origin lamb loin chops WTP results did not show any significant difference between the three information levels.

The worth of the secondary information about Free-Range and Generic lamb meat presented to the respondents were of statistical significance (caused significant statistical changes) to the online respondents. On the other hand, the worth of the secondary information about Natural lamb meat was statistically significant to the respondents of the physical sample. Therefore, the information presented about Free-Range, Generic and Natural lamb was of such great value to the respondents that it significantly updated their home-values in such a manner that it became part of their stated WTP values.

The secondary information about Region-of-Origin lamb did not have a significant impact on any of the respondents' home-values. To determine exactly between which information levels the significant differences occurred (between pre- and post-info, pre- and 3 months post- info and, or post-info and 3 months post-info), Wilcoxon's signed rank test was used.

6.2.3 Wilcoxon's signed rank test results

The Wilcoxon signed rank test is a non-parametric test used to determine whether or not there is a difference between pairs of data in a related group. This is a common statistical method used in pre- and post-test designs. The Wilcoxon's signed rank test was used to determine exactly between which levels of information the significant statistical differences (identified through the Friedman's ANOVA in section 6.2.2) occurred. The results are statistically significant when a p-value smaller than 0.05 is calculated. The results summarised in Table 6.5, indicates exactly between which information treatments significant differences occurred.

Table 6.5: Wilcoxon signed rank test results

		Wilcoxon signed rank test	
		Auction groups	
Differentiated claim:	**Difference in information effects:**	**Significance value (p-value)**	
		Online	**Physical**
Free-Range	Pre-Post	0.001*	0.017**
	Post - 3 Months Post	0.351	0.861
	Pre - 3 Months Post	0.648	0.176
Natural	Pre-Post	0.003*	0.002*
	Post - 3 Months Post	0.47	0.52
	Pre - 3 Months Post	0.569	0.004*
Region-of-Origin	Pre-Post	0.418	0.439
	Post - 3 Months Post	0.893	0.552
	Pre - 3 Months Post	0.639	0.674
Generic	Pre-Post	0.009***	0.04***
	Post - 3 Months Post	0.964	0.129
	Pre - 3 Months Post	0.074˜	0.168

* - Statistically significant at 0.01 ** - Statistically significant at 0.02 *** - Statistically significant at 0.05

Free-Range

For the Free-Range lamb loin chops, the difference in the WTP values between pre-information and immediately after the information was given (post-info) is statistically significant across all auction samples. The online sample did show greater significance when compared with the physical sample, but both are significant even though Friedman's ANOVA showed that the overall difference for the physical sample was not significant. The combined sample's p-value is extremely significant. The difference between the WTP values for the post- and 3 months post-information as well as the difference between the pre- and 3 months post-information levels are statistically insignificant for both the online and physical samples. Therefore, it can be concluded that the immediate (short-term) impact of positive secondary information on Free-Range lamb loin chops was significant across all auction samples. This impact caused a statistically significant increase in the online and physical samples' respondents' WTP values.

Natural

The difference between pre- and post-information WTP values for Natural lamb loin chops were significant in both samples. Within the physical sample, a significant difference in the WTP values between the pre- and 3-month post-information levels was calculated. Thus, an inference can be made that the immediate (short-term) effect of positive secondary information on Natural lamb loin chops was significant across both samples.

Region-of-Origin

The results for the Region-of-Origin lamb loin chops are interesting in that there are no significant results. In other words, the different levels of information did not have a statistically significant effect on the participants' WTP value. Hence, the positive secondary information was not effective enough to update the participants' prior knowledge and beliefs about the product. With reference to Chapter Five, this could also be attributed to

the fact that Region-of-Origin lamb is not readily available at most retail outlets or that the consumers might not be familiar with the product.

Generic

Based on the feedback from participants discussed in Chapter Five it was clear that the prior knowledge and home-values about Generic lamb loin chops were already negatively framed. Friedman's ANOVA showed that there is a significant difference in information levels for the online and combined auction samples. These differences occurred between the pre- and post-information levels, in both the physical and online samples. When these results are compared with the average WTP values and graphs in section 6.2, the positive secondary information had a negative update effect on the participants and their WTP values. Even though the information provided was positive, it was not as descriptive and comforting in painting a positive picture about the production processes employed, as the information about the other three products.

6.3 Summary

This chapter investigated and presented the results from the random n^{th}-price auction and the online stated preference experiment. The purpose of this investigation was to determine if consumers are willing to pay a premium for a product after positive secondary information about the differentiated fresh products' quality cues and attributes are given; additionally, the study investigated if the consumers are still willing to pay that premium three months after the positive secondary information was given.

For the statistical analysis of the data, the average WTP values were determined for each differentiated fresh lamb meat product, across three levels of information, namely pre-, post- and 3 months post-information. The average WTP values were used to visually demonstrate the effect of positive secondary information on the WTP values. From the average WTP data, it is clear that the effect of the positive secondary information was the largest immediately after it was presented. The long-term effect of the positive secondary

information, three months later, was smaller than the immediate effect, but still positive. The effect of positive secondary information on the Generic lamb was more negative immediately after the information was presented than in the long-term. These results suggest that the participants did retain some information over the three month period, updating their prior knowledge and beliefs.

Friedman's ANOVA was used to determine if there are any differences among the information levels for each product. These results were further analysed through Wilcoxon's signed rank test to determine exactly where the difference occurred and if these differences are statistically significant. From the Wilcoxon's signed rank test results, it can be concluded that there were significant differences occurred for between the pre- and post-information levels across all but the Region-of-Origin differentiated fresh lamb meat products in all the auction samples. Two surprising results occurred within the physical and combined auction samples. A significant difference between the pre- and 3-month post-information levels occurred for the Natural and Generic lamb meat products. This suggests that the positive secondary information presented to the participants had a long-term effect on their decision-making process for these two products.

The overall WTP results suggest that the consumers are willing to pay a premium for a product immediately, and three months after receiving positive secondary information about the differentiated fresh products' quality cues and attributes. Even though the effect of the positive secondary information was negative in the case of a Generic product, the information still had an impact on the WTP.

Chapter Seven

Summary and Conclusions

7.1 Introduction

Within the South African meat milieu, there are numerous brands, labels and claims trying to convince consumers to buy Karoo lambs chops, grass-fed steaks and real “boerewors”. However, does the terminology and concepts used on the labels (primary information) mean anything to the consumers? Alternatively, can additional information (secondary information) relating to the production and rearing processes really convince the consumer to pay a premium for these unique claims relating to the meat’s quality cues and attributes?

The role of information on food demand and WTP has been studied to a great extent, including the outcome of labels and additional information pertaining to the content of labels. Liaukonyte et al., (2015) found that when additional information is presented to subjects, they evaluate the primary information more confidently, update their prior beliefs and home-values and then decide whether or not the ingredients and production processes are consistent with their preferences. However, within the South African context, there has not been a study, which focused on researching the effect of positive secondary information on consumers’ WTP for fresh lamb meat products. This created the ideal platform for an appropriate case study within the South African meat marketing system. This gap in the Agricultural Economics knowledge base served as the motivation for this study.

7.2 Summary of the problem and research objective

Consumers search for, collect and interpret information about food products and production processes to make purchase and consumption decisions based on this available information. However, information about food products and food production processes in the South African agricultural and food markets are often incomplete, conflicting, and not freely available, distributed unevenly, or is not credible. This information asymmetry within the market of differentiated fresh lamb meat products results in consumers making uninformed purchase decisions. The information on food packaging (primary information) or additional information (secondary information) about the production of food products is key to understanding what motivates consumers to decide to purchase or not purchase differentiated fresh lamb meat products.

The study aimed to contribute to the literature, by minimising this knowledge gap through investigating the effect of positive secondary information on South African consumers' WTP for differentiated fresh lamb meat products. Furthermore, the proposed consumer research and WTP experiments aim to establish whether consumers trust the available information to the extent that they apply it to their decision-making processes when purchasing differentiated fresh lamb meat products. Through measuring the impact which secondary information has on the consumers' WTP for differentiated fresh lamb meat products, consumers' motivations in their decision-making processes can be determined. Understanding which quality cues and attributes consumers search for and knowing what makes information credible to consumers will assist producers and marketers in developing effective information and marketing campaigns about differentiated fresh lamb meat products. By making use of information which consumers trust and will use, is a good starting point to ensure an efficient and competitive (sustainable) industry for differentiated fresh lamb meat products in South Africa.

The objectives of the study were to examine if and how positive secondary information about differentiated fresh lamb meat products impacted consumers' WTP for these products over time. More specifically the study aimed to determine whether consumers understood the different claims of each differentiated fresh lamb meat product. Through

applying the specific mechanism identified, the willingness to pay a premium for differentiated fresh lamb meat products were measured given the participants' current inherent knowledge. The same mechanisms were used to measure the impact of secondary information on WTP, immediately after and three months after the secondary information was presented.

7.3 Summary of the results and findings

The results of the pre- and post-auction surveys, presented in Chapter Four, provided insights to the respondents' demographic structure, their meat purchasing and consumption behaviour and their prior knowledge of differentiated fresh lamb meat products. Just more than half (58%) of the online sample had a good understanding and prior knowledge of what the Free-Range claim implies. Moreover, for Natural lamb meat, 31% of the online sample believed the animals are grass-fed, and 33% stated the animals are not in feedlots. The results for prior knowledge about the Region-of-Origin claim indicated that 80% of the online sample understood that the lamb loin chops produced and marketed under these claims come from a specific area. The prior knowledge and beliefs about Generic lamb loin chops were negatively framed; 36% of the online sample did not know what "Generic" meant.

The physical sample's results indicated that 67% of the sample's respondents understood that the animals are not reared in a feedlot system. The Natural claim exposed some uncertainty among the respondents, but despite the uncertainty, the overall perception about these claims was positively framed, with 27% of respondents stating they believe the product is healthy and free of additives (20%). The physical sample described Region-of-Origin meat to have unique characteristics in taste and smell (40%) and production methods (33%). In the physical sample, prior knowledge and beliefs about Generic lamb loin chops were also negatively framed; 47% of the physical sample stated that the animals are reared in feedlots.

Chapter Five presented the results of the experimental auctions and the effect of positive secondary information on WTP. The average WTP values in both samples, for Free-Range, Natural and Region-of-Origin lamb loin chops, increased immediately after positive secondary information was presented to the respondents. The average WTP for the Generic lamb loin chops decreased in immediately after secondary information was presented. (Refer to Figure 6.1 and Figure 6.2).

The average WTP values Free-Range, Natural and Region-of-Origin lamb loin chops, showed an increase in the long-term (three months after the positive secondary information was presented). The biggest percentage change in average WTP values occurred in the physical sample. The participants were willing to pay 18.5% more three months later, which is 4.3 percentage points higher than their WTP immediately after the secondary information was presented (see Table 6.1 for all the values).

Friedmans' ANOVA results showed that the overall impact of the secondary information provided was statistically significant for Free-Range and Generic in the online sample (at a 0.07 level of significance). The secondary information provided to the physical sample about Natural lamb were statistically significant at a 0.05 significance level.

The effect of positive secondary information on the WTP of the participants was significant immediately after the positive secondary information was presented. The Wilcoxon test results (given in Table 6.5) are significant for the online sample's results for Free-Range and Natural at a 0.01 level of significance. For the physical sample, the effect of positive secondary information on the WTP was significant (significance level 0.01) immediately after and three months after the secondary information was presented. The immediate effect for Free-Range was significant at a 0.02 level of significance. The effect positive secondary information had on the WTP for Generic lamb meat products was negative immediately after the information was presented in both samples at a significance level of 0.05. These results indicate that positive secondary information had a significant impact on consumers' WTP, immediately after the information was presented to them.

The majority of participants in both samples stated that fresh lamb meat should be marketed according to the differentiated claims. Marketing fresh lamb meat according to differentiated claims will not mean anything to the consumer without secondary information about the claims. Only at the very end of the experiments (3 months after the secondary information was presented) did the participants understand that there actually is a difference between differentiated and generic marketing standards. The practical implications for producers, retailers and marketers leaves room for further research.

7.4 Practical implication of the results

The results show that the positive secondary information has a profound effect on consumers' WTP. When the participants were presented with secondary information about the quality cues and attributes about the differentiated fresh meat products, they evaluated the statements and updated their prior knowledge. After updating their prior knowledge, and before submitting their WTP values, the participants had to decide whether the information provided is in line with their personal preferences. Therefore, this effect is just as important as the information given by the primary information labels.

Within the South African fresh meat marketing and labelling milieu, it could be postulated that a need for secondary information really exists. From the main findings of this study, it is clear that the immediate effect of the positive secondary information was greater than that of the long-term impact. Hence, from this study, there is enough evidence to support the provision of positive secondary information to consumers, at the point of the purchasing decision. Providing consumers with secondary information can be done as easy as augmenting the information listed on the primary labels or through elaborate in-store and media campaigns.

7.5 Recommendations

This study made use of two sample groups, which had its challenges. Due to the fact that there had to be a three month period between the experimental auction days, a decrease in sample size was expected. For the physical auction sample, 15 of the original 21 participants returned. The online surveys and auction method also had its limitations. For the online sample, participants could stop at any point and opt out. This made is very difficult to "clean" the data to compile complete data sets. Only 36 of a possible 124 data sets could be used for analyses. From the overall experience, a suggestion in this regard is that the combination of the physical (face-to-face) surveying and auction procedures are more reliable than the web-based contingent valuation methods. The online respondents seemed to get distracted while busy with the surveys and stopped before completing the surveys, resulting in incomplete data sets. This was not the case for the physical sample's participants, as they committed to the auction days from start to finish. Then again, the advantage of employing online stated preference experiments is that a greater reach of participants is included in the sample.

One of the selection requirements for participating in this study were that the respondent should be a regular consumer of fresh lamb meat products. Because lamb and mutton are the most expensive meat options to South African consumers, the scope of consumers was limited to those of the higher LSM groups. Therefore, lower income groups were not included in the analysis of the effect of positive secondary information on WTP. Future research based on the same structure as this study could use a more basic food product to include a wider spectrum of LSM groups to determine if all consumers respond similarly to the provision of secondary information.

Further research can be done to explore in which form the positive secondary information should be presented to consumers on a continuous basis. Another factor to include in future research is to determine the ideal frequency of providing secondary information if it is not on a label or if it is costly to provide it through media. The effect of negative secondary information could also provide insights. It is important to remember that the

research findings are based on data obtained from an environment simulated to represent the field.

In-store experiments where secondary information is provided, and the immediate impact of the secondary information on WTP is recorded will contribute to the result of a more real-life market environment. This will, in turn, serve as a test and evaluation of the results from this study, possibly generating noteworthy observations, which could be used within the fresh meat-marketing milieu of South Africa.

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Appendices

Appendix A: Auction and Bidding Procedure

GENERAL INFORMATION.

Dear Participant

Welcome and thank you for choosing to participate in this research study. This booklet contains all the information you will need during the bidding exercise and binding experimental auction rounds. Two types of products will be used in the bidding experiment.

- Differentiated bottled water.
- Differentiated fresh lamb loin chops.

Please read the instruction sheet as the auction moves along but DO NOT look ahead until the right point in the exercise is reached. The monitor will tell you when to turn the sheet. You are free to go back and examine any instructions if you need. Please fill in your auction number on every page and auction slip. Your **auction number** is the **first 3 letters of your name and your birthday** (day then the month), for example, FRA2811.

Please remember that as explained on invitation to the auction, by participating in the official auction exercise you are agreeing to purchase the product up for auction with your own actual money if your bid is accepted.

Please follow the instructions carefully and do not talk to any other participants for the duration of the auction.

All information obtained today will be used only for group comparisons. No information on any individual will be disclosed for any reason.

Please review the next page only to familiarise yourself with how this particular bidding exercise will operate.

Detailed instructions of how the bidding exercise works, will be explained to you by the monitor before we begin.

After the official bidding rounds, there will be an information session with regard to the second set of bidding rounds in 3 months.

At the very end of the day, there will be a lucky draw where 3 participants will win a prize for participating in the auction and completing the survey.

EXPLANATION OF BIDDING EXERCISE

We will be conducting a bidding exercise today. In a moment we will be asking you to write down your bid for the first product on a bid slip. This is private information; please do not show your bids to another participant.

There are four steps in this exercise.

1. View the product

Before we ask you to bid on a product, we will carry the product around the room and allow you to view it, so you know what product you will be bidding on.

2. Write down your bid for the product

After the product is viewed, you can write down how much you would pay for this product on your bid slip.

3. Random choosing of the payment price

Once everyone has bid, and the bids have been collected, we will write up the bids from highest to lowest. Then we will randomly pick one of these bids by drawing a random number (*n*) between 2 and *k* (where *k* = the number of participants) from a bag containing numbered tiles. *n*=2 is the second highest bid, *n*=8 is the eight highest bid and so forth. This will be called the "Payment price". (We will go through an example of this).

4. Determine who pays the payment price and receives the product.

The payment price is the "cut-off". Everyone who bid **higher** than the payment price will be obligated to purchase the product and will **pay** the payment price. Everyone who bid at or below the payment price will not have the opportunity to purchase the product.

NOTE:

In this bidding exercise, it is in your best interest to bid your true value for the product. In other words, think about how much **you** would pay for this product and write that amount down on your bid slip. Remember, if you bid more or less than your true value, i.e. how much you would really be willing to pay for the product, you may end up paying more than you wanted for the product or be giving up an opportunity to purchase the product.

You are allowed to bid zero / R 0.00.

Every round of bidding is completely independent, in other words, what you bid in one round should and will not have any influence on how you bid in the next.

Are there any Questions?

PRACTICE ROUNDS

Explanation of the Practice Rounds:

There will be two practice bidding rounds. Only one of the two practice rounds will be binding, in other words, only one of the two practice rounds will be chosen as the round where participants will be obligated to purchase a product (i.e. only one round will count). Since it is unknown which round will be chosen, it is in your best interest to bid your true value for the products in both practice rounds. The binding round will be chosen after the second practice round by a coin toss. Bids must be placed in increments of R 1.00

Steps of the Practice Rounds

1. Take a look at the bottled water being shown around the room.
2. Place your bid for the bottled water on the piece of paper marked **PR1WO** in the top right corner.
3. Bids will be collected.

STOP!

Please wait until you are asked to turn the sheet.

- -**TEAR HERE**- -

PR1WO

Auction number: ______________________________

Bid amount: ______________________________

4. Take a look at the second type of bottled water being shown around the room.
5. Place your bid for the second bottle of bottled water on the piece of paper marked **PR2WO** in the top right corner.
6. Bids will be collected.
7. The binding round will be selected by a coin toss – heads for round one, tails for round two.
8. The payment price will be determined randomly by drawing a numbered tile.
9. All participants with bids higher than the payment price will purchase the product. They will be paying this payment price.

STOP!

Please wait until you are asked to turn the sheet.

- -**TEAR HERE**- -

PR2WO

Auction number: ______________________________

Bid amount: ______________________________

Experimental Auction (differentiated lamb loin chops):

Explanation:

The lamb chops auction will have four rounds of bidding. Only one of the four rounds will be binding, i.e. only one round will count where people will actually pay money and exchange products. The binding round will only be determined at the end of the fourth round by randomly drawing a numbered tile from a bag. Please make sure your details are filled in. It is still in your best interest to bid your true value for the products in all the rounds. Bids must be placed in increments of R1.

Steps for the Experimental Auction Round 1:

1. Take a look at the 500 g pack of **GENERIC** lamb chops being shown around.
2. Place your bid for the **GENERIC** lamb loin by writing the Rand value on the piece of paper marked **BR1GO** in the top right corner.
3. Bids will be collected and sorted.
4. Please remain silent and seated for the next round to start.

STOP!

Please wait until you are asked to turn the sheet.

- -**TEAR HERE**- -

BR1GO

Auction number: ______________________________

Bid amount: ______________________________

Steps for the Experimental Auction Round 2:

1. Take a look at the 500 g pack of **REGION-OF-ORIGIN** lamb chops being shown around.
2. Place your bid for the **REGION-OF-ORIGIN** lamb loin by writing the Rand value on the piece of paper marked **BR2RO** in the top right corner.
3. Bids will be collected and sorted.
4. Please remain silent and seated for the next round to start.

STOP!

Please wait until you are asked to turn the sheet.

- -**TEAR HERE**- -

BR2RO

Auction number: ______________________________

Bid amount: ______________________________

Steps for the Experimental Auction Round 3:

1. Take a look at the 500 g pack of **NATURAL** lamb chops being shown around.
2. Place your bid for the **NATURAL** lamb loin by writing the Rand value on the piece of paper marked **BR3NO** in the top right corner.
3. Bids will be collected and sorted.
4. Please remain silent and seated for the next round to start.

STOP!

Please wait until you are asked to turn the sheet.

- -**TEAR HERE**- -

BR3NO

Auction number: ______________________________

Bid amount: ______________________________

Steps for the Experimental Auction Round 4:

1. Take a look at the 500 g pack of **FREE-RANGE** lamb chops being shown around.
2. Place your bid for the **FREE-RANGE** lamb loin by writing the Rand value on the piece of paper marked **BR4FO** in the top right corner.
3. Bids will be collected and sorted.
4. The payment price will be determined randomly by drawing a numbered tile.
5. All participants with bids higher than the payment price will purchase the product. They will be paying this payment price.
6. All participants with bids higher than the payment price will purchase the product. The price they pay will be the payment price.

End of bidding exercise.

- -**TEAR HERE**- -

BR4FO

Auction number: ______________________________

Bid amount: ______________________________

Appendix B: Pre-Auction Survey

Faculty of Natural and Agricultural Sciences

Department of Agricultural Economics, Extension and Rural Development.

Pre-Auction Consumer Survey

- Please answer all questions below.
- The information will be treated in the strictest of confidence.
- You will not be asked to identify yourself on the survey.
- Please mark (x) **only one** box for each of the following questions.

SECTION 1: RED MEAT

1. Are you the primary **FOOD** shopper in your household?

	Yes
	No

2. Are you the primary **MEAT** shopper in your household?

	Yes
	No

3. Have you ever taken a course in nutrition or food science?

	Yes
	No

4. How often do you consume **RED MEAT**?

	Every day
	1-2 times per week
	3-6 times per week
	Twice a month
	Once a month
	Less than once a month

5. Indicate **one** outlet where you are **most likely** to purchase **FRESH** (not frozen) **RED MEAT**?

	Butchery
	Spar
	Checkers
	Woolworths
	Pick ‘n Pay
	Other, please specify:

SECTION 2: SHEEP MEAT (LAMB AND MUTTON)

6. How often do you consume **lamb** or **mutton**?

	Every day
	1-2 times per week
	3-4 times per week
	Twice a month
	Once a month
	Less than once a month

7. Indicate **one** outlet where you are **most likely** to purchase **lamb or mutton**?

	Butchery
	Spar
	Checkers
	Woolworths
	Pick 'n Pay
	Other, please specify:

8. Which factors do you consider when purchasing **lamb** or **mutton**? Please rank the following options from most important to least important by writing the numbers 1 to 7 in the open column.

	Price/kg
	Brand
	Packaging
	Fat content/marbling
	Meat cut (Leg, rib, etc.)
	Way of production (Organic, Free-Range etc.)
	Region of production (Free-State, Kalahari etc.)

SECTION 3: INFORMATION

9. Please use **five descriptive words** to explain what you think **FREE-RANGE lamb/mutton** is:

_____

_____

_____

_____

_____

10. Please use **five descriptive words** to explain what you think **NATURAL lamb/mutton** is:

_____

_____

_____

_____

_____

11. Please use **five descriptive words** to explain what you think **REGION-OF-ORIGIN lamb/mutton** is:

_____

_____

_____

_____

_____

12. Please use **five descriptive words** to explain what you think **GENERIC lamb/mutton** is:

_____

_____

_____

_____

_____

SECTION 4: DEMOGRAPHICS

13. Gender:

	Female
	Male

14. Age:

	24 – 29 years
	30 – 39 years
	40 – 49 years
	50 – 59 years
	60 years and over

15. What is the highest level of education you achieved?

	Grade 11 or lower
	Grade 12 / Matric
	Technicon diploma
	University degree – not completed
	University degree – completed
	Postgraduate degree
	Other post-matric qualification

16. Total monthly **household** income:

	< R 25 000
	R 25 000 – R 29 999
	R 30 000 – R 34 999
	R 35 000 – R 39 999
	R 40 000 – R 45 000
	R 45 000 – R49 999
	> R 50 000

17. What is your occupation:

18. Household size: ☐

19. Do you have any additional comments or thoughts that you would like to share? (optional)

_____

_____

_____

_____

_____

_____

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_____

Appendix C: Post-Auction Survey

Faculty of Natural and Agricultural Sciences

Department of Agricultural Economics, Extension and Rural Development.

Post-Auction Consumer Survey

- Please answer all questions below.
- The information will be treated in the strictest of confidence.
- You will not be asked to identify yourself on the survey.
- Please mark (x) **only one** box for each of the following questions.

SECTION 1: DEMOGRAPHICS

1. Gender:

	Female
	Male

2. Age:

	24 – 29 years
	30 – 39 years
	40 – 49 years
	50 – 59 years
	60 years and over

3. Monthly **household** income:

	< R 25 000
	R 25 000 – R 29 999
	R 30 000 – R 34 999
	R 35 000 – R 39 999
	R 40 000 – R 45 000
	R 45 000 – R49 999
	> R 50 000

SECTION 2: LABELS

4. Do you usually read food labels on the front of **FRESH MEAT** packaging?

	Yes
	No
	Sometimes

5. If '**Yes**', what are the 3 things you notice on the labels on the front of **FRESH MEAT** packaging? Please list these in order of importance.

   1)_____

   _____

   2)_____

   _____

   3)_____

   _____

6. If you selected '**Sometimes**', please explain under which circumstances you would read the labels on the front of **FRESH MEAT** packaging.

   _____

   _____

   _____

   _____

   _____

7. If '**No**', please rank three specific reasons why you don't read the labels on the front of **FRESH MEAT** packaging.

   1)_____

   _____

   2)_____

   _____

   3)_____

   _____

SECTION 3: INFORMATION

8. Do you think there is enough information on **FRESH MEAT** packaging?

	Yes
	No

9. If '**No**', please indicate what important information you would like to see on **FRESH MEAT** packaging. Please list these from most to least important.

_____

_____

_____

_____

_____

_____

10. Which three sources do you consider trustworthy to obtain information about **FRESH MEAT**? Please list the source from most to least trustworthy.

1)_____

_____

2)_____

_____

3)_____

_____

11. Did you believe the information that was provided about differentiated **FRESH LAMB MEAT** during the previous bidding exercise (3 months ago)? Why or why not?

_____

_____

_____

_____

_____

SECTION 4: PURCHASES

12. How much did know about the differences in claims (Free-Range, Region-of-Origin, Natural and Generic) made about differentiated **FRESH LAMB MEAT** products, before participating in this study?

	Very Familiar
	Somewhat Familiar
	Not Familiar

13. Has your purchase decisions for **FRESH LAMB MEAT** products changed since your participation in this research study?

	No change
	Slight change
	Big change

14. Please explain your answer in Question 13.

_____

_____

_____

_____

15. Which factors do you consider when purchasing **FRESH LAMB** or **MUTTON**? Please rank the following options from most to least important by writing the numbers 1 to 7 in the open column.

	Price/kg
	Brand
	Packaging
	Fat content/marbling
	Meat cut (Leg, rib, etc.)
	Way of production (Organic, Free-Range etc.)
	Region of production (Free-State, Kalahari etc.)

16. What are the three biggest factors/reasons <u>keeping you from purchasing</u> **FRESH LAMB MEAT** products? Please rank these factors/reasons.

1)_____

_____

2)_____

_____

3)_____

_____

17. Do you think **FRESH LAMB MEAT** should be marketed Generically, as a homogenous meat category, or according to differentiated claims, such as Free-Range, Karoo Meat of Origin or Certified Natural?

	Generic marketing
	According to differentiated claims

18. Do you have any additional comments which you feel will contribute to the success of this study (optional)?

_____

_____

_____

_____

_____

_____

_____

_____

_____

Thank you for participating.

Appendix D: Auction Photographs

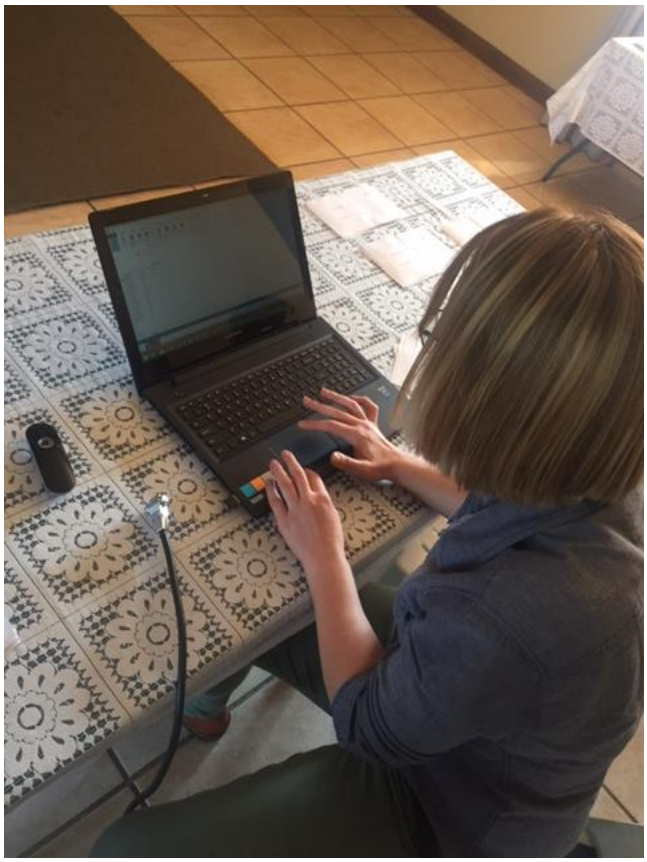
Participants listening to procedures for the first auction day held in May 2017.

The differentiated fresh lamb meat products are shown to the participants.

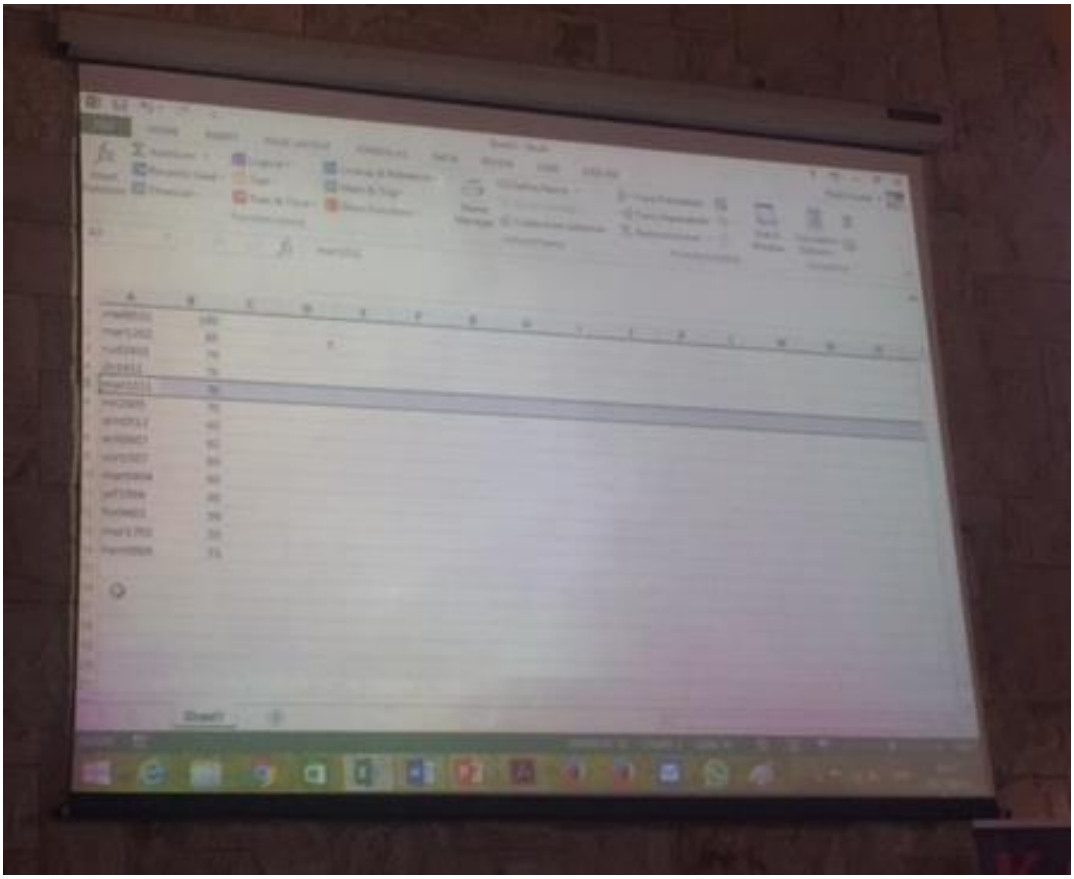
The differentiated fresh lamb meat products.

The prizes for the lucky-draw after the experimental auction exercise.

The start of the second auction day held three months later in August 2017.



Determining the 'winners' for the second day of experimental auction.

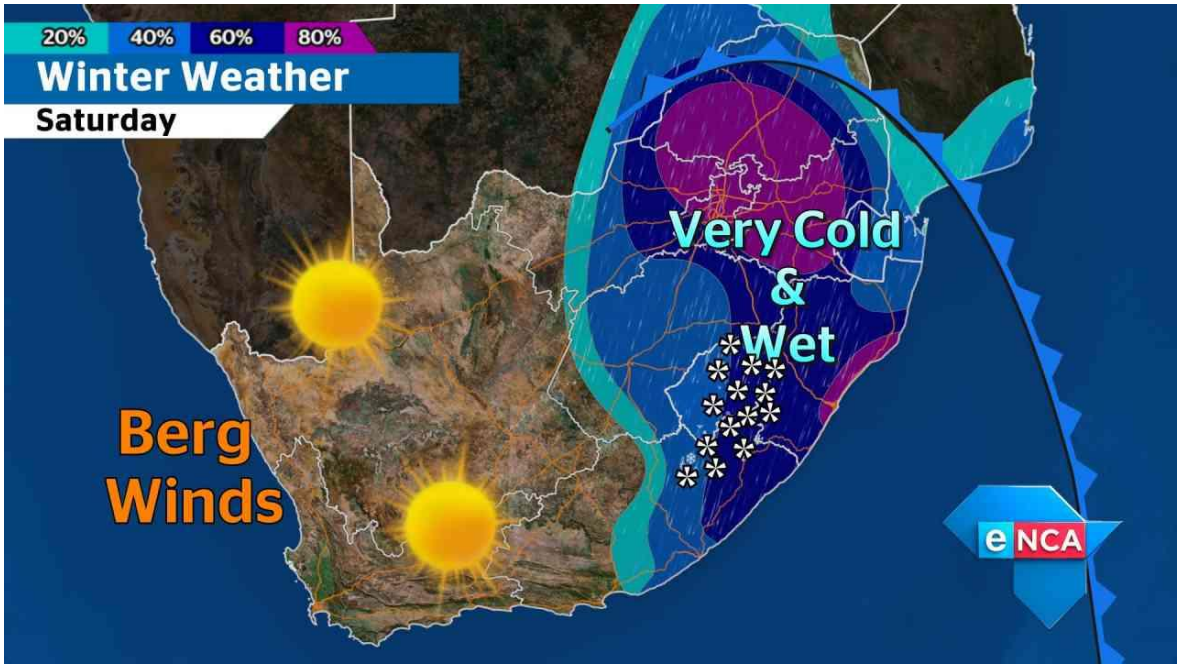


The submitted WTP values used to determine the ‘winners’ of the auction.

One of the lucky-draw winners.

Appendix E: Other

Weather forecast for auction day - Saturday 13 May 2017



Source: eNCA.com, 2017

Wintery Weekend Weather

Friday 12 May 2017 – 13:11

"South Africans are bracing for a wintery weekend as a cut-off low continues to affect the country over the next few days. The initial cold front will move away to the east tomorrow, but the low remains over the central interior keeping the cold air in circulation over the country. This system has the added effect of producing cloudy and wet conditions in the east where it will be a particularly cold Saturday as temperatures remain in the single digits over the mountains and some areas over the eastern Highveld while many other inland areas only reach the low teens."

“Maar wie tot die einde volhard, sal gered word.”

Matteus 24:13