

FOOD TRACEABILITY IN THE CONTEXT OF KAROO LAMB: SUPPLY CHAIN AND CONSUMER PERSPECTIVES

by

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ABSTRACT

Food traceability in the context of Karoo lamb: Supply chain and consumer perspectives

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'Karoo lamb' is a product with specific regional qualities that are based on, among other factors, the natural environment present in the region of origin. Together with the specific product qualities, regional image factors create a unique identity for a product, as is the case of 'Karoo lamb', in this way bringing about added value. Consumers will only consume food products that fulfil their specific requirements and have become more demanding about what they want. As food markets have become more globalised, consumers have become more concerned about the origin of the food they eat, with decreased confidence in the quality and safety of foods produced outside their local region or country. Traceability systems address these concerns, and the importance of establishing a link between a product, producer and place of production has therefore gained momentum as a trend.

The overall goal of the research was to explore the role and contribution of traceability as a system relating to a product of origin, specifically 'Karoo lamb', and the influence it has on consumers' decision-making processes when selecting and purchasing 'Karoo lamb'. Consumer decision making is a complex and dynamic process that can be explained according to a consumer decision model that specifies its various stages.

The research was conducted in three phases. During the first phase a quantitative research approach was followed to investigate and describe the audit processes that have been implemented by different retailers in South Africa regarding the traceability of lamb meat. In

the second phase, focus group sessions, a recognised qualitative research technique, were conducted to identify the product attributes that were critical to consumers' preferences and choices regarding the product, 'Karoo lamb'. In the third phase the attributes, namely *price*, *safety*, *quality*, *traceability* and *origin*, were identified as significant factors influencing consumer choice and used in a conjoint questionnaire. A quantitative approach was followed in phase three and a questionnaire was used to measure the importance individual consumers attach to the different levels of the various product attributes. The utility values were based on the survey participants' evaluation of the complete product.

Price is often known to be one of the most important and determining factors in the consumer's decision-making process. A higher price can sometimes symbolise better quality or safety of the product for the consumers. The results from the conjoint questionnaire have shown that price, as an extrinsic attribute, was found to be the most important factor in a consumer's decision-making process at 30.4% when purchasing lamb. Safety at 23.1% was the second most important attribute after price. This is not surprising given the legacy of BSE and e-coli outbreaks that were given much publicity in the press. The third attribute affecting the purchasing decision was quality at 17.0%. The fourth attribute of traceability affected the purchasing decision at 15.7% and the importance of the fifth attribute, region of origin, was 13.8%. According to the participants, the origin attribute had the lowest rating of importance of all five attributes selected for the conjoint questionnaire.

As the conjoint experiment was conducted electronically, the participants of the conjoint questionnaire were solicited with the assistance of a marketing research firm, Consulta Research (Pty) Ltd., based in Centurion in the Gauteng province of South Africa, and were part of the consumer panel of consenting survey participants for the company. In total 352 completed questionnaires were used in the data analysis. The buying and/or consuming of mutton or lamb were the only criteria that needed to be met for participation in the conjoint questionnaire.

In conclusion it can be said that there is a lack of certification and guarantee in South Africa that the product that is marketed as 'Karoo lamb' truly originates from the Karoo, and consumers can easily be misled as to the true origin of the lamb being sold. Traceability can be an important tool to help to establish the authenticity of food products and to check that claims made by producers are true.

OPSOMMING

Voedsel naspeurbaarheid in die konteks van Karoo lam:

Die verskaffingsketting en verbruiker perspektief

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Karoo lamsvleis is 'n streeksgebonde produk wat gebaseer is op die natuurlike omgewing in die gebied van oorsprong. Tesame met die spesifieke produk gebaseerde kwaliteite word 'n unieke produk identiteit geskep deur die streeks faktore soos gesien met Karoo lam en hiermee bring dit toegevoegde waarde mee. Verbruikers sal slegs voedselprodukte aankoop en eet wat hul spesieke aanvraag benodigdhede vervul. Omdat voedselmarkte wêreldwyd meer en meer impak maak op verbruikers begin hulle konsentreer op die herkoms van produkte. Verbruikers het verminderde vertrouwe in die kwaliteit en veiligheid van produkte wat geproduseer word buite streeks- en landsgrense. Naspoorbaarheid sisteme spreek hierdie probleme aan en die belangrikheid om 'n skakel tussen produk, produsent en plek van produksie te vind het veld gewen as tendens.

Die primêre doel van hierdie navorsingsstudie was om die rol en bydrae van naspoorbaarheid as 'n sisteem ten opsigte van produk oorsprong en spesifiek Karoo lamsvleis te ondersoek, asook die invloed daarvan op verbruiker besluitnemings tydens die keuse en aankoop van Karoo lamsvleis. Omrede die verbruikers besluitnemingsproses kompleks en dinamies is kan dit verduidelik word met 'n verbruikers besluitnemings model wat die verskillende fases van die proses beskryf.

Die studieprojek is uitgevoer in drie fases. Met die eerste fase is 'n kwantitatiewe benadering gevolg om ondersoek in te stel en te beskryf hoe en watter ouditprosesse geïmplimenter is deur groothandelaars ten opsigte van die naspeurbaarheid van lamsvleis in Suid Afrika. Tydens fase twee is fokus groep besprekings, 'n kwalitatiewe navorsings tegniek, geloods om die produk kenmerke wat verbruikers besluitneming ten opsigte van die produk lamsvleis beïnvloed te bepaal. Die kenmerke prys, veiligheid, kwaliteit, naspeurbaarheid en oorsprong is geïdentifiseer en gebruik in fase drie, die voorkeurkeuse ontleding. 'n Kwantitatiewe benadering is gevolg in fase drie om die belangrikheid te bepaal wat verbruikers heg aan die verskillende kenmerke en die vlakke van die onderskeie produk kenmerke.

Prys is bekend as een van die mees belangrikste en invloedryke faktore in die verbruikers besluitnemings proses. 'n Hoër prys simboliseer soms beter kwaliteit en veiligheid aan 'n verbruiker. Die resultate van die voorkeurkeuse ontleding het getoon dat prys met 30.4% as 'n uiterlike kenmerk, die belangrikste invloed het op verbruikers besluitneming. Veiligheid met 23.1% was die tweede belangrikste kenmerk na prys. Bogenoemde was nie 'n verrassing nie aangesien die pers wêreldwyd al baie aandag gegee het aan die uitbreking van die e-coli epidemies. Kwaliteit was die derde belangrikste kenmerk wat verbruikers besluitneming beïnvloed het met 17.0%. Naspeurbaarheid as kenmerk het die besluitnemings proses beïnvloed met 15.7% en oorsprong in die vyfde plek met 13.8%. Daar is gevind dat oorsprong as kenmerk verbruikers se besluitneming die minste beïnvloed het.

Die deelnemers aan die elektroniese voorkeurkeuse ontledingsopname is verkry vanaf die databasis van die bemarking navorsings maatskappy Consulta Research (Pty) Ltd, wat geleë is in Centurion, in die Gauteng provinsie van Suid Afrika. 'n Totaal van 352 voltooide vraelyste is gebruik vir die data analise. Die aankoop en verbruik van lam en skaap vleis was die enigste kriterium wat gebruik is in die werwingsproses van die deelnemers.

Samevattend kan genoem word dat daar 'n gebrek bestaan in Suid Afrika in die sertifisering en waarborg van die produk Karoo lamsvleis wat bemark word as afkomstig van die Karoo. Sodoende kan verbruikers maklik mislei word oor die ware oorsprong van die produk. Naspeurbaarheid kan 'n baie belangrike instrument wees om die geloofwaardigheid van voedsel te bepaal en te verseker dat die aannames ten opsigte van oorsprong wat produsente maak die waarheid weerspieël.

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LIST OF ABBREVIATIONS AND ACRONYMS

ACA	Adaptive conjoint analysis
BSE	Bovine Spongiform Encephalopathy
CA	Conjoint analysis
CBC	Choice-based conjoint analysis
CLA	Conjugated Linoleic Acid
CVA	Conjoint value analysis
GI	Geographical indications
HACCP	Hazard Analysis Critical Control Point
ID	Identification
IP	Internet Protocol
ISO	International Organisation for Standardisation
LSM	Living Standard Measures
OLS	Ordinary least squares
RFID	Radio Frequency Identification Devices
SA	South Africa (Republic of South Africa)
SAARF	South African Advertising Research Foundation

SABS	South African Bureau of Standards
SAMIC	South African Meat Industry Company
SANS	South African national standard
StanSa	Standards South Africa
TTA	Traceability, transparency and assurance
UP	University of Pretoria
WTP	Willingness to pay
WWW	World Wide Web

DECLARATION

I, Henriëtte du Plessis hereby declare that the dissertation for the Master's degree at the University of Pretoria, hereby submitted by me, has not previously been submitted for a degree at this or any other University and that it is my own work in design and execution and that all reference material contained therein has been duly acknowledged.

.....
Signature

.....
Date

PREFACE

Part 1

The Karoo covers almost 50% of the total land area of South Africa. It is a flat semi-arid area covered with dry scrubland that stretches north-eastwards from the Northern Cape. 'Karoo lamb' is a meat product with specific regional qualities. It can be argued that the natural environment present in the region of its origin (the Karoo) together with the fragrant Karoo shrubs and the free-range conditions under which the animals roam, result in the unique and particular taste ¹ of the lamb.

Worldwide, consumers have become more concerned about the origin of the foods they consume for a variety of reasons that include decreased confidence in the perceived quality and safety of food products. Food traceability systems have the ability to track a food product throughout the food chain and are considered to be indispensable in assuring product safety for consumers and for implementing quality standards. In the case of 'Karoo lamb', traceability can be considered both a buying and a confidence criterion as the term is an information provider about the origin, the producer and the ingredient (high quality lamb meat).

However, in South Africa there is a lack of certification and guarantee that the product which is marketed as 'Karoo lamb' truly originates from the Karoo and consumers can easily be misled as to the true origin of the lamb being sold. South Africa has to date elected to protect geographical origins or indications (GI) under trademark laws, even though some food products like 'Karoo lamb' are indigenous to South Africa. Traceability can be an important tool in helping to establish the authenticity of food and to check that claims made by producers are in fact true.

The first chapter of this Master's dissertation outlines the basic purpose and justification of the study. It serves as the prelude for the main body of the study. The purpose of the research is elaborated on, with reference to the measures that were utilised and it provides a synopsis of the importance of the study. A research plan is presented in this chapter.

Chapter Two of this dissertation gives an account of the reviewed literature. This review is arranged in different sections regarding the consumer decision-making.

¹'taste' is used to describe Karoo lamb and not 'flavour' as suggested by Kirsten, Troskie, Vermeulen, Schonfeldt & Bramley, 2008.

process, factors influencing the decision process, the product 'Karoo lamb' and the product attributes as influencing factors. The chapter starts by providing an insight into the fundamental aspects of the consumer behaviour model, specifically addressing concepts pertaining to this research, such as consumer decision-making and decision rules. The last section deals with the intrinsic and extrinsic product attributes that influence consumer decision making when purchasing lamb.

Chapter Three reports on the regulatory aspects of red meat (including legislation) in South Africa and the findings of the auditing of the meat supply chain. The chapter investigates and describes the different audit processes in the meat supply chain (starting with the farmer, to the abattoir, to the processing plant and ending with the retailer), the reasons why the audit processes are in place and the outcome of the different audit processes that the retailers have instigated. Secondary data was analysed to try and ascertain whether traceability in the red meat industry exists and whether traceability is able to provide a reliable link between a food product of origin and the retailer.

Chapter Four provides detail about the research methodology, specifically the data collection techniques, focus groups and methods of analysis. The application of conjoint analysis to model consumers' decision making regarding 'Karoo lamb' is discussed. The research design, sampling techniques and internet-based survey method of obtaining data are addressed and detail about the format of questions used is given. The procedures and techniques for data analysis are also specified, with regard to the constructs measured.

Chapter Five provides the main findings of the research in terms of the second aim of the research - the establishment of the attributes mostly considered by consumers in their decision making when purchasing lamb from the Karoo region. An electronic conjoint questionnaire was used to determine and to describe the different levels of importance of the product attributes that influence the purchasing decision of consumers regarding 'Karoo lamb'. The insights gained from the questionnaire are discussed, as well as the limitations and assumptions that may have led to biases of significance or non-significance found. Conjoint simulation was used to test alternative product scenarios by changing the levels to find the optimum importance and preference of each profile.

Chapter Six concludes with a summary of the main findings and understanding gained. Furthermore, the chapter discussed the research propositions that were set for the research. Limitations of the research are also offered and recommendations for further research are made contemplating both extensions of the research and related endeavours.

The findings from the research have resulted in two articles that have been accepted for publication (2011) in two internationally peer-reviewed scientific journals the *International Journal of Consumer Studies* and *Food Research International*.

Part 2

This research project constitutes an important area within the food research focus of the Department of Consumer Science at the University of Pretoria, with support from the Department of Agricultural Economics, Extension and Rural Development also at the University of Pretoria. It focuses on the consumer component of a larger project entitled: Consumer behaviour and cognitive aspects regarding the sensory evaluation of regional foods: the specific case of Karoo Lamb. It further contributes to providing consumer evidence to support the processes of policy formulation and implementation regarding geographical indicators that are required for a country.

The research was exploratory rather than definitive in nature. An exploratory research approach was used as the topic that the researcher examined is relatively new. The objectives of exploration may be accomplished using different techniques and the researcher employed both quantitative and qualitative techniques to be able to reach the research goal. Both qualitative and quantitative research approaches involve systematic methods to gather high-quality data, but in each approach the measurement process is different.

The use of research propositions in this dissertation needs some clarification. Cooper and Schindler (2011:140) argue that the immediate purpose of exploration is usually to develop hypotheses or questions for further research. Through exploration a researcher develops concepts more clearly and establishes priorities.

Researchers use propositions to state their expected research results. A proposition is more qualitative and at a higher level than a hypothesis. According to Cooper and Schindler (2011:62) the research literature disagrees about the meaning of the terms proposition and hypothesis. A research proposition is a broad statement drawn from a theory and states a relationship between concepts that may be judged as true or false if it refers to observable phenomena. The following three propositions were formulated in the dissertation:

P1: *A link between the product (lamb), the producer and place of origin (Karoo region) is relevant to consumers who purchase lamb meat.*

P2: *Different product attributes and combinations of attributes influence consumers' decision-making when purchasing lamb.*

P3: *Different levels of importance are attached to the product attributes by consumers in their decision-making process when purchasing lamb.*

The data for this research was collected using a 'multi-method approach'. This is a method where more than one data collection technique is used and the techniques are combined. The research has therefore used a sequential method where one category of data provided a base for collecting and developing the research with another category of data. The research process involved a quantitative approach that also implemented qualitative techniques such as focus groups as a method to obtain data, and conjoint analysis, a data analysis method, and a specialist data collection method. A comprehensive research plan is presented in Chapter 1.

The data was collected in three phases:

- In **Phase 1** an investigation was conducted of current audit processes that are available to “create” and monitor the supply chain link between producer and consumer, a quantitative technique, for the purpose of ensuring that traceability is guaranteed where secondary data is used.
- In **Phase 2** three different focus group discussions were held (qualitative technique), where the different attributes that influence consumers in their decision making towards lamb were determined.
- In **Phase 3** an electronically mailed survey using a structured questionnaire, was used as a quantitative technique to ascertain the importance of the different lamb meat attributes. Conjoint value analysis (CVA) was also an applied method.

The referencing done in this research was done according to the principles and techniques of the adapted Harvard method as required by the Department of Consumer Science at the University of Pretoria. Hence the researcher has listed all the authors in a reference the first time the reference was used and thereafter use was made of the *et al.* convention.

Research for the dissertation commenced more than four years prior to the completion of this document. The methodology part of conjoint, the analysis and results of the conjoint analysis was done under the supervision of a leading expert in the field of conjoint analysis in South Africa, Prof A Schreuder from the marketing research firm, Consulta Research (Pty) Ltd in Centurion, South Africa.

It is my sincere hope that the work presented in this dissertation has contributed to our knowledge of food traceability in the context of products similar to 'Karoo lamb'.

CHAPTER 1

INTRODUCTION TO THE RESEARCH

1.1 Background to the research

Food markets have become more globalised with the result that consumers have become more concerned about the origin of the foods they eat, and are becoming more enthusiastic about high quality food with a clear regional identity. Kelly, Heaton and Hoogewerf (2005:555) state that the reasons for this may vary and could be because of patriotism; specific culinary, organoleptic qualities or health benefits associated with regional products; a decreased confidence in the quality and safety of foods produced outside their local region, country; or concern about animal welfare; and 'environmentally friendly' production methods. These can be addressed if a link between the product, the producer and the origin of the product can be established.

By nature, food products are mainly land- and/or water- based and therefore have a regional or geographic origin, but the link between food and territory has eroded over time and food consumption patterns no longer necessarily reflect the production pattern of a region (Kuznesof, Tregear & Moxey, 1997:199). However there is renewed interest in foods strongly identified with a place or region of origin. 'Karoo' (a geographical indication or GI) lamb is a product with specific regional qualities that are based on, among others, the natural environment present in the region of origin. Together with the specific product qualities, regional image factors create a unique identity for a product, as in the case of 'Karoo lamb', and, through this, bring about added value (Van Ittersum, Candel & Meulenbergh, 2003:215). There is a worldwide consumer trend for value-added food products instead of greater quantities of food (Imram, 1999:224). A regional indication like 'Karoo' offers an opportunity for differentiating the product from both foreign and domestic competitors and allowing it to develop its own uniqueness.

All over the world consumers have become more detached from food production and have started to demand more information about the origin and ingredients of their food, where it was produced and the ways of production as well as the extent of the use of pesticides (Kelly, *et al.*, 2005:555). Consumers are demanding reassurance that the food they buy is really what it claims to be, as the profit motive often prevails over food quality and human health (Van Rijswijk, Frewer, Menozzi & Faioli, 2008:459). Fraud has become highly sophisticated and food scandals

have seriously undermined consumer confidence, resulting in consumers becoming more discerning and demanding (Raspor, 2008:405). Food scares and the malpractices of some food producers have added to public sensitivity regarding the validity of food origin labelling. Consumers want clear labels so that they are sure the product can be trusted, requiring a credible label that guarantees the traceability of their food (Halawany & Giraud, 2006:13).

The form in which food consumption is taking place is changing too. This is expressed in a number of ways. For example, increased interest in food safety, greater concern for environmental and animal welfare issues, increased importance of eating quality and the greater role of food services (Taljaard, Jooste & Asfaha, 2006:214). Despite the complex nature of the modern day relationship between humans and food, the fact remains that humans must eat to survive. Consumers face various competitors' products in their purchase choice (Weatherell, Tregear & Allinson, 2003:234) and their purchasing decision is based on several attributes or cues such as price, functional characteristics, external appearance, guarantee, safety, brand or designation of origin. A heightened awareness of food-related safety issues among today's food consumers is driving the demand for more information about the vertical food supply chain and specifically, the origin and handling of food products generated and consumed throughout the world (Smith, Tatum, Belk, Scanga, Grandin & Sofos, 2005:175).

Food traceability and safety systems per se guarantee nothing except the ability to track the product throughout the food chain (Verbeke, 2001:254; Hobbs, 2003:15). However, it is considered to be indispensable in assuring product safety for consumers and for implementing quality standards, for delivering wholesome products to end-consumers and providing reliable information and feedback throughout the livestock production chain (Verbeke, 2001:254). Therefore the words 'transparency' and 'assurance' can be used interchangeably with traceability (Verbeke, 2001:250). In the case of 'Karoo lamb' traceability can be considered both a buying and a confidence criterion especially when it is taken as an information provider of the origin, the producer and the ingredient (high quality lamb meat).

What South African consumers want in terms of traceability cannot yet be answered as consumer awareness and the influence of traceability on the consumer decision making process regarding meat products and specifically 'Karoo lamb', have not yet been determined by research.

1.2 Research problem

'Karoo Lamb' is a meat product with a high proportion of experience attributes, attributes that can really only be assessed during consumption. Consumers might associate the name 'Karoo' with a number of attributes such as perceived quality, risk factors (like safety and health) and identifying product cues.

The overall goal of this research is to explore the role and contribution of the traceability system in linking product, producer and place of production as it relates to 'Karoo lamb' specifically and the influence of traceability on consumers' expectations and their decision-making process when selecting and purchasing 'Karoo lamb'. As confirmed by the title of the dissertation the aim of this research is therefore to determine or establish:

- A link between product, the lamb, producer and place of origin, the Karoo region, with specific reference to traceability
- Attributes mostly considered by consumers in their decision-making process when purchasing lamb from the Karoo region

1.3 Research objectives

The following primary and secondary objectives are set for this study:

The primary objectives of this study are:

- To investigate and explain the existing audit processes in place for the traceability of products of origin with specific reference to 'Karoo lamb'
- To determine and describe the product attributes that influence consumers purchasing decision of 'Karoo lamb'

The secondary research objectives are:

- To consider the current regulations and legislation in South Africa regarding traceability and traceability systems for red meat
- To establish whether retailers have implemented traceability systems for 'Karoo lamb'
- To determine the need for and the role of traceability in the supply chain management process of 'Karoo lamb', identifying its advantages and benefits

- To ascertain the attributes mostly considered by consumers in their purchasing decision of lamb
- To determine and describe the different levels of importance of the product attributes that influences the purchasing decision of consumers regarding 'Karoo lamb'
- To examine the contribution of traceability in labelling/branding of 'Karoo lamb'
- To verify the need of establishing a Geographical Indication for the regional product, 'Karoo lamb' in South Africa

1.4 Research propositions

Research is guided by a specific research problem, question or hypothesis. Focusing a research study on a proposition, rather than a hypothesis allows the study to concentrate on particular relationships between events, without having to comply with the rigorous characteristics required of hypotheses.

The use of research propositions in this dissertation needs some clarification. Cooper and Schindler (2011:140) argue that the immediate purpose of academic exploration (research) is usually to develop hypothesis or questions for further research. Through exploration a researcher develops concepts more clearly and establishes priorities.

Researchers use propositions to state their expected research results. A proposition is more qualitative and at a higher level than a hypothesis. According to Cooper and Schindler (2011:62) the research literature disagrees about the meaning of the terms proposition and hypothesis. A research proposition is a broad statement drawn from a theory and states a relationship between concepts that may be judged as true or false if it refers to observable phenomena. When a proposition is formulated for empirical testing, it is called a hypothesis (Cooper & Schindler, 2011:62). A hypothesis is of a tentative and conjectural nature.

For the purpose of the present study the following research propositions were formulated that will be judged according to the definition of Cooper and Schindler (2011:62) that a proposition is a statement about concepts that may be judged true or false if it refers to observable phenomena. The propositions will be accepted if they can be judged to be true or rejected if they can be judged to be false. Three research propositions were formulated:

P1: *A link between the product (lamb), the producer and place of origin (Karoo region), is relevant to consumers who purchase lamb meat.*

P2: *Different product attributes and combinations of attributions influence consumers' decision making when purchasing lamb.*

P3: *Different levels of importance are attached to the product attributes by consumers in their decision making process when purchasing lamb.*

1.5 Contribution of the research

South African law does not explicitly acknowledge or provide protection for geographical indications but protects geographical rights under trademark law. Research about traceability and traceability systems could be utilised to support initiatives and the making of policies regarding the identification and protection of regional food products. Such initiatives will put South Africa in line with global measures and will offer protection to consumers in terms of the health and safety benefits of traceability systems.

The possible application of information about traceability that is generated out of the research could perhaps be used as an initiative in the marketing of 'Karoo lamb' and in policy making regarding regional food products with specific reference to 'Karoo lamb'.

The execution of this study will assist in:

- establishing the need for or role of traceability in the supply chain management of 'Karoo lamb'
- will explore the influence of traceability and its perceived benefits on the consumer decision-making process when selecting/purchasing 'Karoo lamb'
- will determine the contribution of traceability to labelling and branding of 'Karoo lamb'
- will determine the need of establishing GI's for regional products in South Africa specifically 'Karoo lamb'
- will explore the current situation in South Africa regarding traceability and traceability systems of red meat
- will formalise recommendations regarding the showcasing of the culinary heritage of a regional food such as 'Karoo lamb' and

- will assist retailers in establishing the need for and role of traceability in the supply chain management of ‘Karoo lamb’

1.6 Justification for the research

This research project constitutes an important area within the food research focus of the Department of Consumer Science at the University of Pretoria (UP), with support from the Department of Agricultural Economics, Extension and Rural Development (UP). It focuses on the consumer component of a larger project entitled: *Consumer behaviour and cognitive aspects regarding the sensory evaluation of regional foods: the specific case of Karoo Lamb*. It further contributes to providing consumer evidence to support the process of policy formulation and implementation regarding geographical indications that are required for a country.

Lamb is a product with a high proportion of attributes that are called experience attributes, because they can only be assessed during consumption. Due to the nature of the product the ability of consumers to assess quality prior to purchase is impaired (Lockshin, Jarvis, d’Hauteville & Perrouty, 2006:167). Consumers use various strategies that include repeat purchases, brand loyalty and a willingness to pay a premium for product reputation to prevent poor quality purchase (Bramley, Biénabe & Kirsten, 2009:115). The name ‘Karoo’ may be associated with a number of attributes, including quality, risk factors, like safety and health, and identifying product cues. The region of origin of a food product may therefore have an indirect impact on consumer preferences. It is therefore critical to determine consumer expectations regarding traceability, and to establish whether the link between product (in this case lamb) and region of origin (the Karoo) influences the purchasing behaviour of consumers in accord with the first aim with the research.

Regarding the first aim the question: “What do South African consumers understand or prefer in terms of traceability”; cannot yet be answered since, in South Africa, consumer awareness of products of origin and demands and expectations regarding this particular product, have not yet been determined. Lamb meat in South Africa is being labelled and sold as originating from the Karoo without insignia, certification or guarantees that the product truly comes from the Karoo when it is sold as ‘Karoo lamb’ (Bramley, *et al.*, 2009:133). The importance of establishing a link between a product, producer and place of production should therefore be confirmed.

Some developing countries, including South Africa, have thus far elected to protect geographical indications (GI) under trademark laws (Bramley, *et al.*, 2009:111), despite the fact that some food products are indigenous to South Africa, are part of the country's culinary heritage and have significant marketing potential in their own right. Geographical indications can be viewed as "the result of a process whereby reputation is institutionalised in order to solve certain problems that arise from information asymmetry and free-riding on reputation" (Bramley & Kirsten, 2007:77). This highlights a fundamental feature of geographical indication protection i.e. that it functions as both a consumer protection measure (through addressing information asymmetries and quality) and a producer protection measure (through its role in protecting reputation as an asset) (Bramley & Kirsten, 2007:77).

Another basic objective addressed through GI protection is rural development. Rural communities have developed typical products based on the interaction between local know-how and particular environment conditions such as the soil and climate (Bramley & Kirsten, 2007:70). However, the value added to these traditional products is not necessarily rewarded and when it is rewarded, the accrued value does not necessarily reach the producers.

As food has a central position in the life of consumers, consumers make food purchase decisions on a daily basis. To answer questions such as when and why consumers buy a product and to understand the process they go through before a purchase, it is necessary to consider the consumer decision-making process (Kotler, Wong, Saunders & Armstrong, 2005). The influences at work in purchasing decisions and the considerations that are involved during different stages of the decision-making process are complex and diverse, and lead to either acceptance or rejection of a food product. Price is by far not the only determining factor in the purchasing of food anymore as other variables have recently acquired importance in this process (Martinez, Molla-Bauza, Gomis & Poveda, 2006:316). With the high incidence of food scares and the malpractices of some food producers, consumers experience decreased confidence in the quality and safety of foods which was the single greatest force for the development of traceability systems worldwide (Verbeke, 2001:250).

Often a traceability system is also a platform on which additional quality assurances or product attributes (that are not readily identified by the end consumer, the so-called credence goods), are provided to consumers (Sykuta, 2005:365). As a consumer cannot check the intangible characteristics at the time of purchase, a label that attests to its validity plays an important role.

It can be defined as a method to convey information on the product's quality and must therefore be credible (Halawany & Giraud, 2006:12). Labelling therefore answers consumers demand for more information and reduces their uncertainty. Traceability labelling is a way to communicate and address transparency between consumers and producers.

Information about traceability and traceability systems could be utilised to support initiatives and the making of policies regarding the identification and protection of regional food products which would subsequently hold social and economic advantages for the specific regions within South Africa, such as the 'Karoo' that produce specialised. However, before such policies can be put in place, it is critical to prove that there is actually an appreciation amongst consumers in South Africa of the link between product and region of origin, similar to that which is found in European countries where notification of such a link has been the practice for centuries (Henchion & McIntyre, 2000:630; Kirsten, 2006:1).

1.7 Overview of methodology

The research was conducted from a consumer-behaviour perspective where the processes that consumers use to select, secure, use and dispose of products, services and experiences were observed. The impacts that these processes had on the consumer were studied. The research took into consideration previously constructed theories and models on which the two research questions discussed in point 1.2 on page 3 were based.

The data for this study was collected using a 'multi-method approach'. This is a method where more than one data collection technique is used and the techniques are combined (Saunders, Lewis & Thornhill, 2003). Data collection involved the application of both quantitative and qualitative techniques, thereby using a sequential method in which one category of data provided a base for collecting information and another category of data was used for developing the research, as described by Mertens (2009). The research process also encompassed a quantitative approach that implemented qualitative techniques that yielded data through focus groups, and conjoint analysis, a specialist data collection method widely used in marketing.

Data was collected in three phases for the purpose of triangulation and to enhance the authenticity of the data:

- In **Phase 1** the first research aim was addressed through an investigation of current audit processes that are available to create and monitor the supply chain link between producer and consumer for the purpose of ensuring that traceability is guaranteed; the procedure can be regarded as a quantitative technique.
- In **Phase 2** three different focus group discussions were held with participants, where the different attributes that influence consumers in their decision making towards lamb were determined yielding qualitative results.
- In **Phase 3** an electronically mailed survey using a structured questionnaire was analysed quantitatively to ascertain the importance of the different lamb meat attributes through conjoint value analysis (CVA) as method.

Conjoint analysis can, amongst other purposes, be used as a method to analyse data when a researcher wishes to analyse consumer purchasing decisions based on the value they attach to certain attributes when making a purchasing decision. These estimated values are called part-worths or utilities. The purchasing decision of consumers for lamb may depend on the joint influence of different product attributes, which can be identified through conjoint analysis of the obtained data in a manner specified by conjoint analysis. Conjoint analysis enabled the researcher to identify the attribute combinations that had the highest level of utility for the consumer and to establish the relative importance of attributes in terms of their contribution to the total utility derived by a specific respondent. A respondent's 'utility' is a measurement of the relative preference the individual has for bundles of products and attributes that influence decisions that will optimise their satisfaction level after consumption. The methodology used in the research is more fully discussed in Chapter three.

1.8 Research plan

The research plan used in the research is shown in Figure 1.1. All the relevant motivation and detailed discussion regarding the various data collected, the data gathering process itself and the analysis aspects will be presented in subsequent chapters.

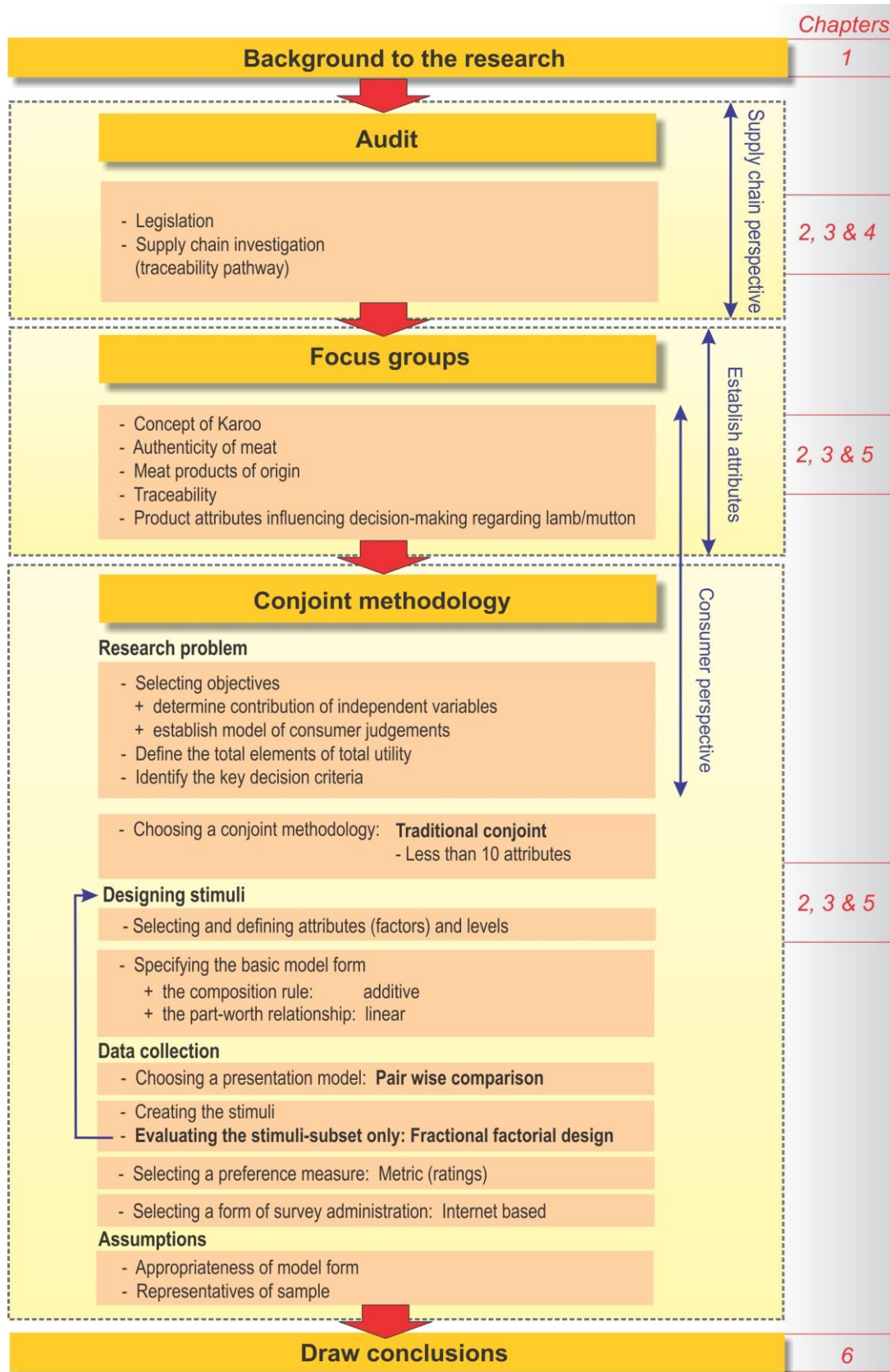


Figure 1.1: Research plan

1.9 Limitations and delimitations

It should be noted that there are certain limitations and delimitations to this research.

The limitations:

- Academic information about the auditing processes of the meat supply chain in South Africa is not readily available in libraries or, for that matter, from any other source
- Agricultural statistics or specific statistics for the lamb/mutton industry are not readily available
- Retail management in South Africa was reluctant to part with detailed information about implemented traceability processes in the supply chain as it was seen as confidential

The delimitations:

- The research has only been conducted in South Africa where the web-based electronic conjoint analysis was executed, as 'Karoo lamb' is a regional product of South Africa
- The research only focused on lamb from the Karoo area as the research was limited to investigating traceability in the context of 'Karoo lamb'
- The respondents were screened and selected for the research based on their purchasing of lamb meat and the sample therefore excluded consumers who were vegetarians due to their active non-participation in consuming lamb meat
- The research did not focus on individual purchase situations but concerned itself with understanding how the cues interacted to predict or understand overall purchasing behaviour for consumers who purchased and consumed 'Karoo lamb'
- The research focused exclusively on the traceability systems implemented in the supply chain for lamb meat
- The research does not take into consideration the nutrient value, nutritional contents or sensory attributes of 'Karoo lamb' but focused only on traceability

1.10 Outline of the report

The written text reflects the development of the research. It is presented in six chapters as follows:

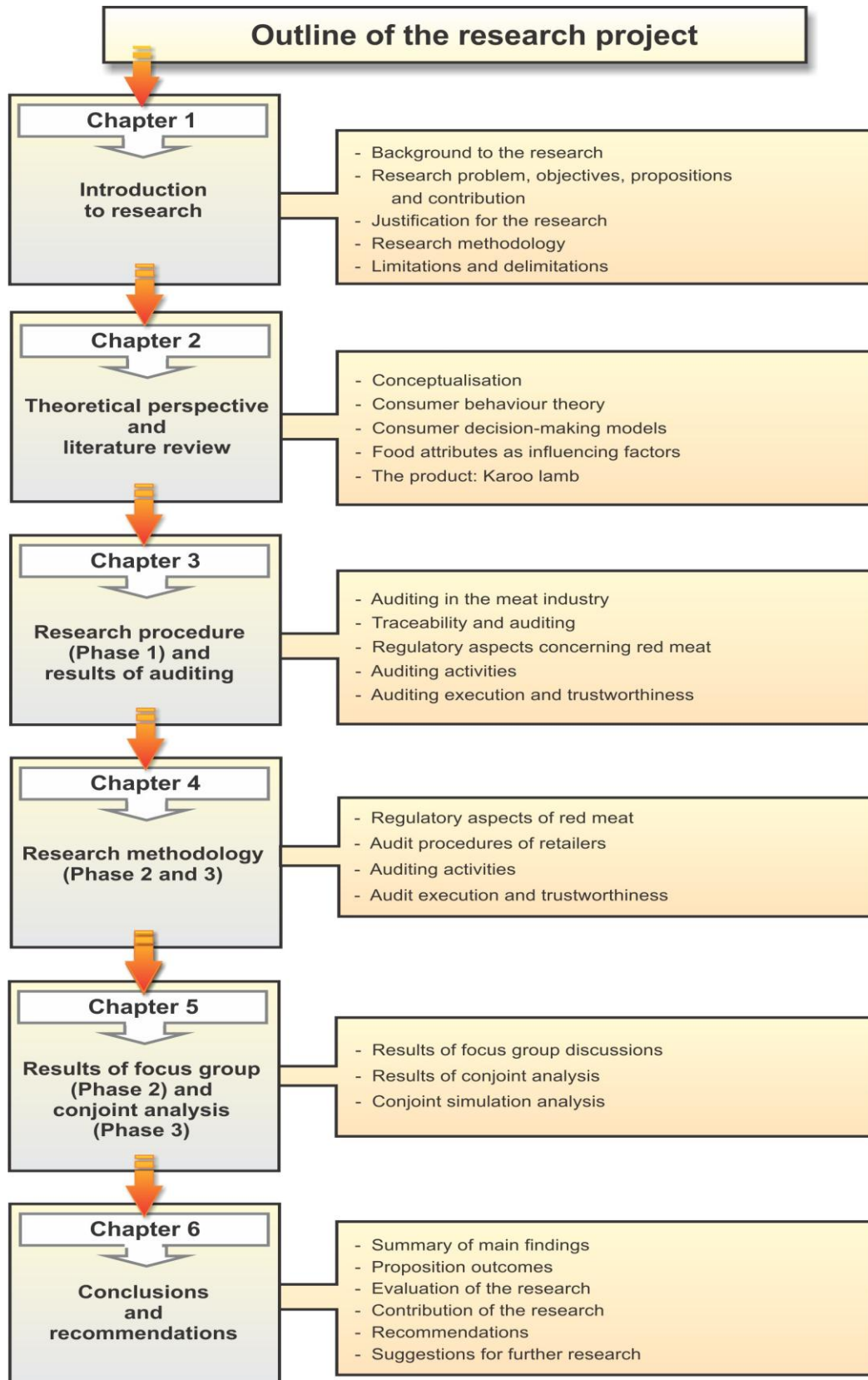


Figure 1.2: Outline of research project

1.11 Summary

The primary objective of this chapter was to provide background and orientation to the research and to introduce its goal and methodology. It sets out the research aim, the purpose and the benefits that could be derived. The data collection methods and the restrictions to which the researcher was subjected were also highlighted as these hindered reaching a conclusion that would do justice to the current situation in the meat industry concerning traceability. Lastly the chapter divisions of the research were given and the content of each chapter was summarised.

CHAPTER 2

THEORETICAL PERSPECTIVE AND LITERATURE REVIEW

2.1 Introduction

This research deals with

- the role and contribution of traceability in linking the product, producer and consumer of ‘Karoo lamb’ and
- the decision-making process of consumers when selecting/purchasing ‘Karoo lamb’

A research framework is proposed that assumes that consumers apply extended problem solving strategies when purchasing lamb from the Karoo region. The proposed framework enables the researcher to examine at what stage of the decision-making process traceability becomes relevant and which variables of the decision-making process are influenced by traceability.

Due to the strong consumer focus of the research, the first component of this chapter covers fundamental aspects of consumer behaviour theory. Consumer behaviour includes those actions that are directly involved in obtaining, consuming and disposing of products and services, including the mental, social and decision processes that precede and follow these actions (Engel, Blackwell & Miniard, 1995:3). The behavioural sciences help to answer questions such as why people choose one product or brand over another, why they make these choices and how this knowledge can be used in this instance to provide value to consumers. The second part of the chapter provides a literature review of the product, ‘Karoo lamb’ and its product attributes, extrinsic and intrinsic.

2.2 Conceptualisation

The conceptual framework for the research process is based on the Schiffman and Kanuk model that is presented in Figure 2.1. It reflects factors that influence consumer decision making that are relevant for this research.

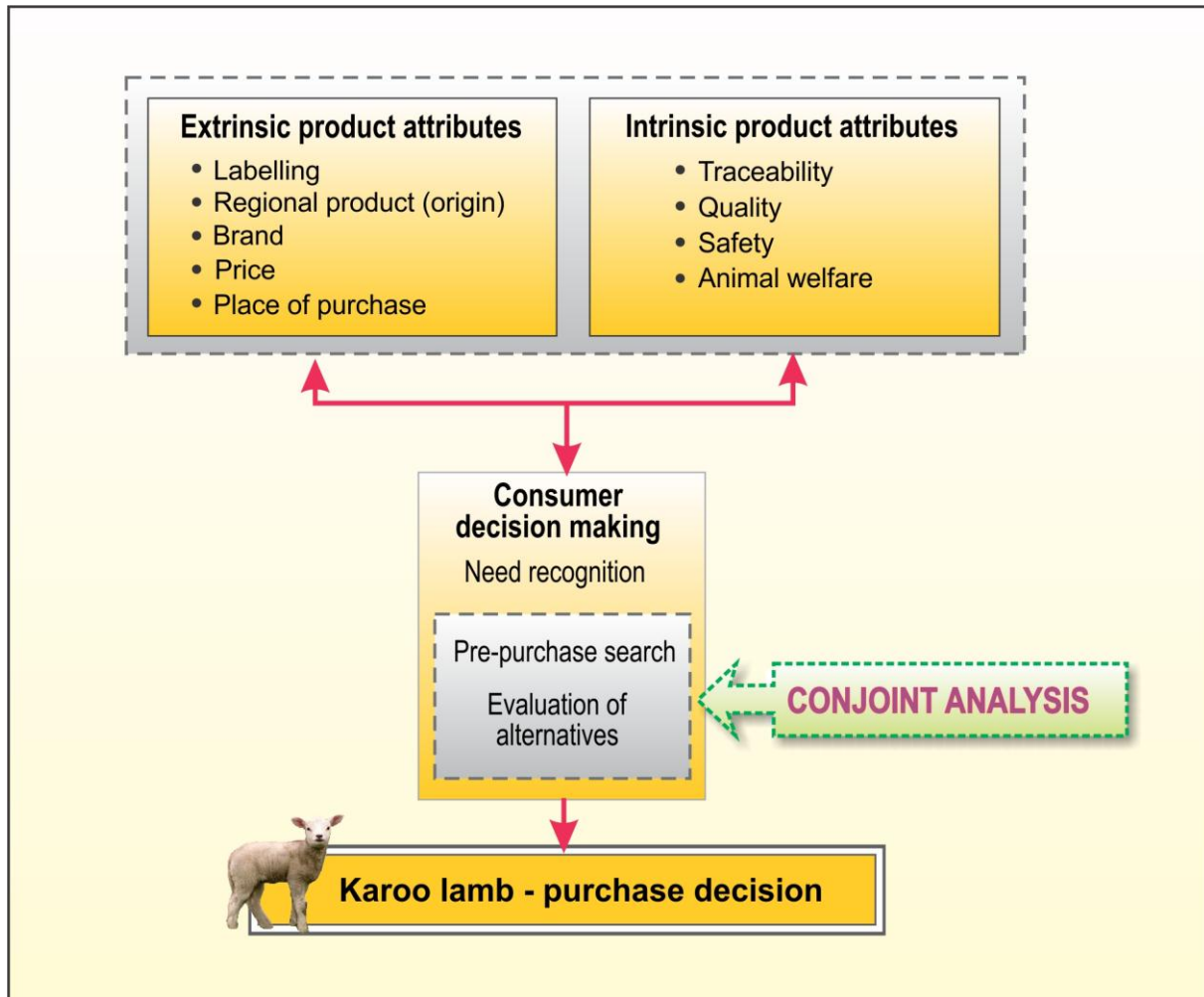


Figure 2.1: Conceptual framework for the study
 (Adapted from Schiffman & Kanuk, 2007:531)

The information search and decision-making process of consumers can be broken into several stages as illustrated in Figure 2.1:

- Recognising a need for information
- Seeking out relevant information (pre-purchase search)
- Evaluating the information
- Making a purchase decision

The consumer decision-making process always commences with the recognition of a need - many authors refer to a problem, rather than a need. The consumer perceives a need and becomes motivated to solve the so-called “problem” recognised. An information search commences with the perception of a need that might be satisfied with the purchase and

consumption of a product. A consumer, therefore, enters this stage when a need is sensed for information on which to base a choice. Consumers tend to employ two types of information when potential alternatives are evaluated - which choice alternatives to consider as well as the criteria used to evaluate each brand. The consumer then has to judge the relative performance of the considered alternatives along the lines of the evaluation criteria. The evaluation criteria are the specific attributes used by the consumer to judge choice alternatives. In the case of 'Karoo lamb' there would be the extrinsic attributes (labelling, origin, brand, price and place of purchase) and the intrinsic attributes (traceability, quality, safety and animal welfare). The fourth stage in the decision-making process is the actual purchase of the product, in this case 'Karoo lamb'.

Therefore, in order to answer questions such as when and why consumers buy a product, and to understand the process they go through before a purchase, it was necessary to investigate consumer behaviour and how the consumer decision-making process took place in this instance.

2.3 Consumer behaviour theory

The term 'consumer behaviour' is defined as the behaviour that consumers display in searching for, purchasing, using, evaluating and disposing of products and services that they expect will satisfy their needs (Schiffman & Kanuk, 2007:3). It focuses on how individuals make decisions to spend their available resources (time, money, effort) on consumption-related items. It includes what they buy, why they buy it, when they buy it, where they buy it, how often they buy it, how often they use it, how they evaluate it after the purchase, the impact of such evaluations on future purchases and how they dispose of it. In order to answer questions such as these concerning when and why consumers buy a product, as well as to understand the process through which they go before a purchase, it is necessary to find out about the consumer decision-making process (Kotler, *et al.*, 2005). Consumer behaviour theory is important for this research because it guides the different steps of the process and what influences the consumers' ultimate decision.

2.4 Consumer decisions

Every day consumers make numerous decisions concerning every aspect of their daily lives. A decision can be described as the selection of an option from two or more alternative choices

(Schiffman & Kanuk, 2007:526) and, in the case of purchasing, can be either simple or complex depending on factors such as the product category, consumer characteristics and user context, and the retail environment.

By using a consumer decision model it is possible to explain consumer decision making that specifies various stages of the consumer decision-making process. From a consumer decision-making perspective, purchasing is considered as one point in a specified course of action undertaken by a consumer. In order to understand purchasing, an examination of preceding events, such as problem recognition, the search for and the processing of information as well as the evaluation of product alternatives, is needed (Verbeke, 2000:524).

The consumer decision-making process signifies goal-striving behaviour and is not just a single activity. It is a sequential and repetitive series of psychological and physical activities ranging from problem recognition to post-purchase behaviour (Brijball, 2003:93). Consumers themselves are influenced by numerous individual factors such as needs, motives, personality, perception, learning, attitudes and affected by environmental factors such as culture, social, business and market influences, reference groups, family and economic demand factors. All of these can collectively be referred to as the “psychological field” (Brijball, 2003:93). During the decision-making process, food judgments and choices thus depend on a variety of stimuli from the environment as well as being affected by internal processes and characteristics of the consumer (Verbeke, 2000:526). The boundaries between groups of stimuli are blurred and factors can be mutually exchanged between groups. Figure 2.2 distinguishes between the consumer’s decision process with respect to food and the factors influencing the decision process. Four stages are identified: need recognition, search for information, evaluation of alternatives and purchase.

Several models of factors affecting the behaviour of individual food consumers have been proposed in the literature (Wierenga, Van Tilburg, Grunert, Steenkamp & Wedel, 1997:144). Although some differences can be observed between the models, they generally distinguish between three types of factors (a) properties of the food (b) factors related to the person engaged in food consumption and (c) environmental factors. Interaction will take place between the three types of factors. Thus any comprehensive analysis of consumer behaviour with respect to food must consider all three categories of factors. Figure 2.2 identifies a number of specific variables relating to each group of factors.

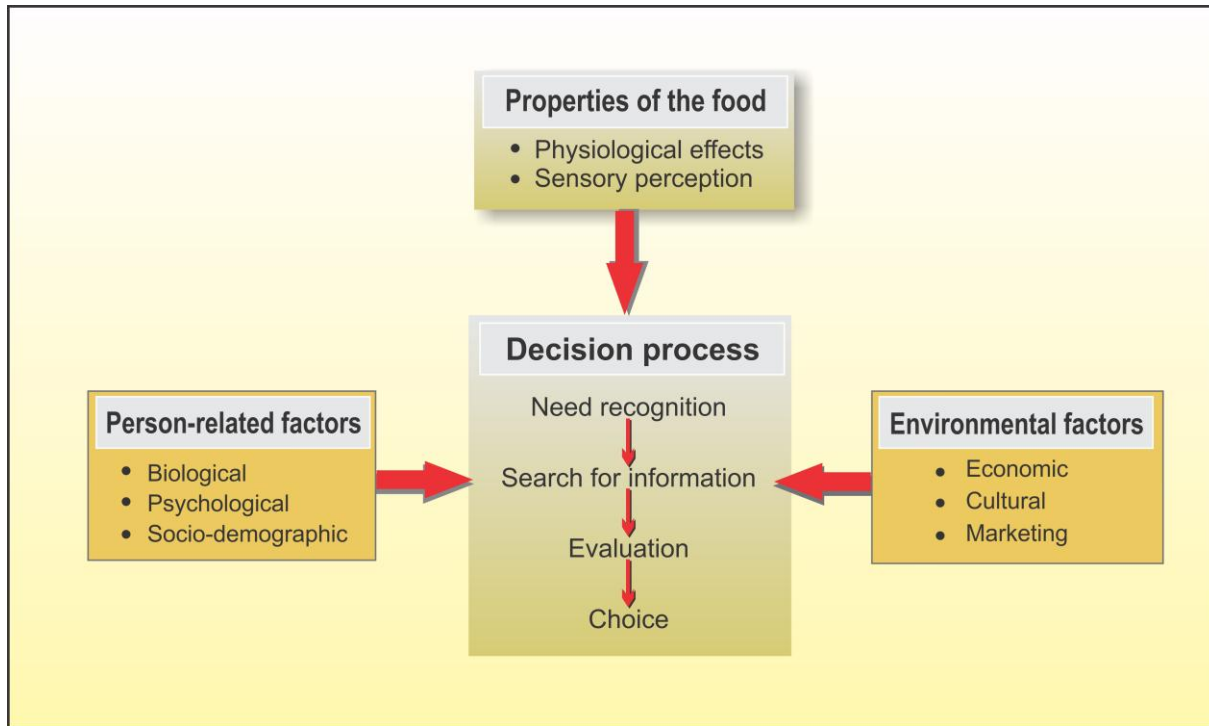


Figure 2.2: Conceptual Model for Consumer Behaviour with Respect to Food
 (Steenkamp in Wierenga, *et al.*, 1997:144)

The categories of factors influencing consumers are divided into properties of the food, person related factors and environmental factors (Figure 2.2). The different factors are discussed next.

Properties of the food

The properties of food can be divided into intrinsic or extrinsic attributes that represent the actual attributes of the food product by referring to their physical and chemical properties, the nutrient content, such as energy value, and how much fibre it contains. The properties of the food affect the whole of consumer behaviour as they satisfy the consumers' physiological experiences such as hunger and appetite and sensory perception (Wierenga, *et al.*, 1997:154).

- **Physiological effects:** hunger reduction and satiation are the normal physiological consequences of eating food (Wierenga, *et al.*, 1997:154).
- **Sensory perception:** sensory variables such as taste, freshness, smell, appearance and nutritive value are some of the most influential factors in the perception and acceptance of food (Radder & Le Roux, 2005:586).

People-related factors

People-related factors are the biological, psychological and demographic variables that relate to the individual consumer's characteristics:

- **Biological factors:** age, gender and body weight affect food consumption behaviour.
- **Psychological factors:** personality, the desire to explore, lifestyle and quality consciousness are personality factors that influence food choices (Wierenga, *et al.*, 1997:158).
- **Socio-demographic influences:** these include age, gender, education, household size, employment status, lifestyle and stage in the life cycle. People from different cultural backgrounds have different priorities, taste preferences (sensory) and needs regarding food and may look differently at food safety issues and risk management depending on their cultural background (Van Rijswijk, *et al.*, 2008:453).

Environmental factors

Environmental factors pertain to the consumer's environment where economic variables like marketing stimuli, income and price have an effect (Wierenga, *et al.*, 1997:158).

- **Economic factors:** the two foremost economic factors influencing food decision making are disposable income and food prices.
- **Culture:** cultural values clearly influence food consumption behaviour but they can also be transmitted through food products. Culture is also person-related and influences an adult's food preferences.
- **Marketing factors:** one important way to add value to a food product is through branding. The country or place of origin will also play a significant role. The distribution of a food product either through a retail outlet or, in the case of meat, through butcheries can also be seen as an influencing factor.

Interaction will take place between the three types of factors and any comprehensive analysis of consumer behaviour with respect to food must consider all three categories of factors.

Not all consumer decision making situations receive or require the same degree of information research (Schiffman & Kanuk, 2007:526). Three specific types or levels of consumer decision making can be distinguished: extensive problem solving, limited problem solving and habitual or routinised decision making. In Table 2.1 the characteristics of limited versus extended problem

solving are described and compared. The types of decision processes are not distinct but rather blend into each other (Hawkins, Mothersbaugh & Best, 2007:613).

Table 2.1: Characteristics of limited vs. extended problem solving
(Solomon, Bamossy, Askegaard & Hogg, 2006:261)

	Limited problem solving	Extended problem solving
Motivation	– Low risk and involvement	– High risk and involvement
Information search	– Little search – Information processed passively – In-store decision likely	– Extensive search – Information processed actively – Multiple sources consulted prior to store visits
Alternative evaluation	– Weakly held beliefs – Only most prominent criteria used – Alternatives perceived as basically similar – Non-compensatory strategy used	– Strongly held beliefs – Many criteria used – Significant differences perceived among alternatives – Compensatory strategy used
Purchase	– Limited shopping time; may prefer self service – Choice often influenced by store displays	– Many outlets shopped if needed – Communication with store personnel often desirable

2.5 Consumer decision-making models

Consumer decision-making models provide broad, organised structures that reflect the basic process of consumer decision making as seen from certain viewpoints and within certain contexts (Walters, 1978:42). It specifies the variables, the way in which these interrelate and the outcomes once when the model is set in motion by various forces. Relationships among the components are indicated and are usually presented visually. Several advantages are also offered in using models of this type:

- Explanations for behaviour are provided, i.e. a change in variables and circumstances can be seen visually
- A frame of reference is provided for research, i.e. it is possible to establish research priorities since gaps in knowledge and understanding become apparent
- A model provides a foundation for management information systems, i.e. essential insights are provided for a marketing strategy because the proper use of a model discloses information required to understand differing consumer decision processes (Engel, *et al.*, 1995:143; Du Plessis, Rousseau & Blem, 1991:18)

Within the scope of consumer behaviour theory a number of consumer behaviour or decision-making models are documented that address various focus areas. The models are widely used in consumer behaviour research to structure theory and research. By using a model one can map out each of the causes or antecedents of a particular behaviour and each of its results or consequences (Lindquist & Sirgy, 2006:18).

Consumer behaviour models used for study and research purposes refer to the elements of the consumer decision process in terms of the traditional five step classification, namely, the cognitive decision sequence of problem recognition, the pre-search stage; information search; alternative evaluation; choice; and outcome evaluation (Schiffman & Kanuk, 2007:530-547; Lindquist & Sirgy, 2006: 27-80; Solomon, *et al.*, 2006:257-278). Consumers do not go through all five steps in all situations. At any or all of the five stages of the decision-making process, the consumer is subjected to a number of influences that may still affect the final decision (Lindquist & Sirgy, 2006:21).

Due to the importance of the consumer decision-making process in this research, a consumer behaviour model that provides a detailed assessment of it has been used to reflect both the cognitive (or problem-solving) consumer and, to some degree, the emotional consumer. The Schiffman and Kanuk model that was chosen also includes variables influencing the decision process and describes the sequence of factors that lead to purchase behaviour.

The model of Schiffman and Kanuk (2007:531) as illustrated in Figure 2.3 is designed to tie together ideas on consumer decision making and illustrates the decision-making process from a systems perspective. It incorporates typical elements of the systems perspective such as inputs, process (or transformation) and outputs. The Schiffman and Kanuk model has been used to display the comprehensiveness of consumer decision making as it portrays all the components relevant to decision making that were required for this research.

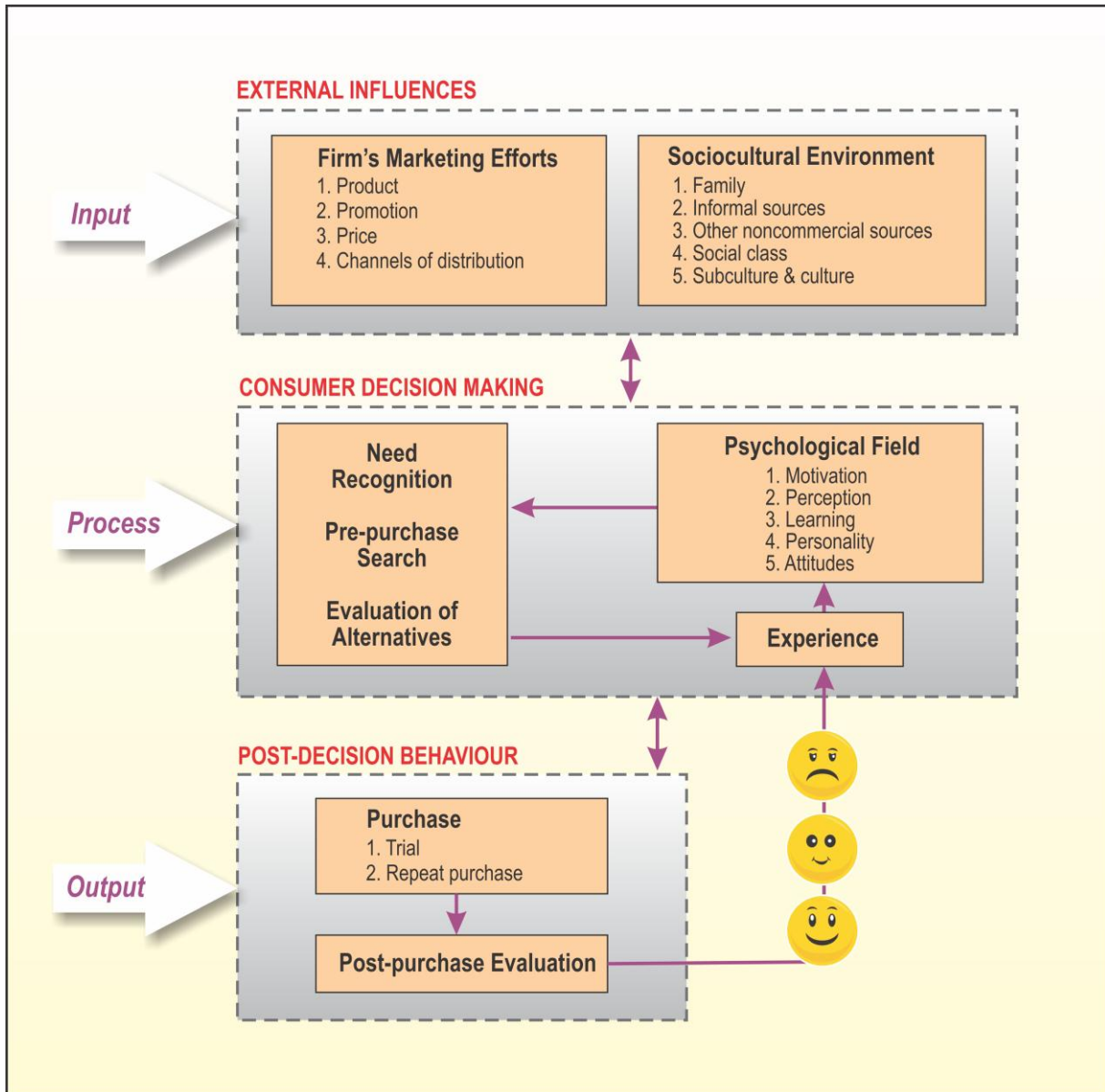


Figure 2.3: Consumer decision making from a systems perspective
 (Schiffman & Kanuk, 2007:531)

The following section provides more insight with regard to systems theory principles that can be applied to consumers' decision-making processes.

2.6 Consumer decision making within the systems approach

As explained by Whitchurch and Constantine in Boss, Doherty, La Rossa, Schum and Steinmetz, (1993:330) a core assumption of systems theory is that of self-reflexivity. Self-reflexivity refers to the ability of human beings to make themselves, and their own behaviour, the

object of examination and the target of explanation. This would typically include consumer behaviour and consumer decision making as illustrated in the model (Figure 2.3) of Schiffman and Kanuk (2007:531).

Inputs: inputs refer to all external influences consumers are confronted with during decision-making processes, such as a company's marketing efforts that focus on product, promotion, price and channels of distribution (Schiffman & Kanuk, 2007:531). Furthermore, Schiffman and Kanuk (2007:532) also acknowledge the fact that consumer decision making occurs within a specific socio-cultural environment. In more extended decision making, information may be obtained, for example, from family and friends as well as informal and other non-commercial sources and be incorporated into the decision-making process as an input.

Transformation: the model (Figure 2.3) further clarifies consumer decision making as a process whereby external influences such as marketing efforts and inputs from the socio-cultural environment are transformed into consumers' recognition of their needs, their pre-purchase search for information and their evaluation of alternatives (Schiffman & Kanuk, 2007:534). This process is then directed by the consumer's psychological field and includes aspects such as the individual's motivation, perception, learning, personality and attitudes (Schiffman & Kanuk, 2007:532). Once the consumer has completed the decision-making process, experience is gained that is then integrated back into the psychological field as indicated in Figure 2.3, simultaneously leading to the accomplishment of certain outputs (Schiffman & Kanuk, 2007:531).

Outputs: outputs refer to the result of transforming the inputs to outputs and represents the achievements of a system's function (Spears & Gregoire, 2003:8). Schiffman and Kanuk (2007:531) deem post-decision behaviour, such as the actual purchase (whether it be trial or repeat purchases) and post-purchase evaluation as outputs of the decision-making process. As far as the post-purchase evaluation is concerned, Schiffman and Kanuk's (2007:531) model illustrates that it can influence consumers' future experience and psychological behaviour, which may be explained as feedback loops.

In explaining consumer decision making within the systems approach the following is postulated in the context of this research:

- Various factors influence consumer decision making – not all of them are of equal importance. In terms of consumers' choice of lamb, they are influenced by the price, colour, fat content, quality, packaging, labelling, safety and origin, which do not necessarily impose the same “pressure” on a consumer. In order to market lamb successfully one has to understand which factors are more influential and which serve as trade-offs, for example, price versus quality.
- Thus, with regard to the factors that influence consumer decision making, there will always be a hierarchy as some factors will dominate the decision.
- Consumer decision making consists of three stages: *input*, *process* and *output* i.e. a system that has order and function. Inputs represent marketing, socio-cultural and individual factors that are transferred through mental and cognitive processes that are obtained by experience and through knowledge leading to a decision outcome that will either be satisfaction or dissatisfaction. The process component concerns how consumers make decisions and therefore the influence of the psychological field too must be considered. Output includes the actual purchase and post-purchase evaluation.
- In any system, the principle of equi-finality, also an assumption, applies in that the outcome (consumer satisfaction/dissatisfaction) can be obtained via various routes. Consumer satisfaction with ‘Karoo lamb’ (as a given) can result from a trade-off between certain factors or a realisation of expectations. The transformation of inputs is done through decision rules that have been broadly classified into two major categories: compensatory and non-compensatory.

The consumer decision-making process is not a single activity or step but a sequential and repetitive set of psychological and physical activities, ranging from problem recognition to post-buying behaviour and is discussed next.

2.7 Consumer decision-making process

Consumers are continuously making decisions about what products and services to purchase since shopping for food is a task performed by most consumers on a daily, weekly and/or monthly basis. The reasons are twofold: first, they have to satisfy their needs and desires and second, often more than one choice or alternative could satisfy their needs (Cant, Brink & Brijball, 2006:193). Consumer decision making directs needs by assessing and selecting the actions that will fulfil them. According to Cant, *et al.*, (2006:193) consumer decision making cannot be observed as it is a cognitive process that consists of those mental activities that

determine which activities are undertaken to remove a tension state caused by a need. Furthermore, these scholars are of the opinion that, since the stages in the process do not necessarily follow each other in strict order, consumers can launch into any stage in the process and follow any order, or even skip certain activities.

In the Schiffman & Kanuk (2007:531) model the process component is the central focus and is concerned with how consumers make decisions. Steps within the decision process include need recognition, a pre-purchase search and evaluation of alternatives. Problem recognition could entail consumer awareness regarding the need to acquire a certain food product like 'Karoo lamb'. The search phase involves a search for the information needed in the consumer's decision-making process. This could include a huge spectrum of information regarding the product: the price, the product attributes, the purchase outlets, labelling information, packaging and product availability. The search can be internal by scanning memory to recall experiences with the product, for example, purchasing or consuming 'Karoo lamb' on a previous occasion, or external. The primary sources of external information are personal sources such as friends or family who recommend 'Karoo lamb', public sources or market-dominated sources, such as advertising that promotes free range, hormone free and organic lamb.

2.7.1 Need recognition

Without recognition of a problem, there is no need for a decision. Problem recognition is the result of a discrepancy between a desired state and an actual state that is sufficient to arouse and activate the decision process (Wierenga, *et al.*, 1997:145). An actual state is the way individuals perceive their feelings and their situation at a given moment in time. A variety of factors affect the actual state. A major cause of a change in the actual state is depletion of the available supply of the food product. A desired state is the way an individual wants to feel or be at the time. The desired state can also be affected in various ways. Influences such as culture, sub-culture, lifestyle trends or changes in socio-demographic characteristics can cause a change in a consumer's desired state (Wierenga, *et al.*, 1997: 145). The level of one's desire to resolve a particular problem depends on two factors: the magnitude of the discrepancy between the desired and actual states, and the relative importance of the problem (Hawkins, *et al.*, 2007:516).

Every individual has needs - some are innate, others are acquired. Most human needs are never fully or permanently satisfied (Schiffman & Kanuk, 2007:89). Innate needs are physiological; they include the need for food, water, air, shelter and sex. Because they are needed to sustain biological life they are considered primary needs or motives. In contrast, acquired needs are needs that we learn as a response to our culture or environment such as self-esteem, prestige, affection, power and learning. Because acquired needs are generally psychological they are considered secondary needs or motives. Acquired needs result from the individual's subjective psychological state and from relationships with others (Schiffman & Kanuk, 2007:83). Individuals are usually more aware of their physiological needs than they are of their psychological needs. For example, most people know when they are hungry or thirsty and will take appropriate steps to satisfy these needs.

In the consumer decision-making process, during the need recognition stage, the region of origin cue (in this case the Karoo) triggers consumer goals that initiate and/or direct the subsequent decision-making process. While in some instances an encounter with a region of origin product may trigger or direct a purchase decision process or this may happen at a later stage of the purchase decision process. In the latter case, it merely provides direction to a consumer's motivation. During the need recognition stage, consumers create a bundle of goals that initiate, direct or terminate a purchase process of a regional product (Karoo lamb).

The information search, as second step in consumers' decision-making process is discussed next.

2.7.2 Search for information

Searching for information happens in the pre-purchase search phase. Consumer information search comprises the mental and physical activities undertaken by consumers to obtain information on identified problems (Cant, *et al.*, 2006:197). It is a learning process through which consumers become aware of alternative products or brands and provides information that is necessary for the consumer when they are evaluating alternatives in order to arrive at the choice that produces the best benefits at the lowest cost (Cant, *et al.*, 2006:197). The likelihood that a regional product (Karoo lamb) will enter the decision-making process largely depends on whether it is identified during the pre-purchase search for information. On the other hand, many

consumers just enjoy browsing through the marketplace and thus engage in an ongoing search. Some differences between these two search modes are described in Table 2.2.

Table 2.2: A Framework for Consumer Information Search
(Solomon, *et al.*, 2006:265)

	Pre-purchase search	Ongoing search
Determinants	<ul style="list-style-type: none"> – Involvement in the purchase – Market environment – Situational factors 	<ul style="list-style-type: none"> – Involvement with the product – Market environment – Situational factors
Motives	<ul style="list-style-type: none"> – Making better purchase decisions 	<ul style="list-style-type: none"> – Building a bank of information for future use – Experiencing fun and pleasure
Outcomes	<ul style="list-style-type: none"> – Increased product and market knowledge – Better purchase decisions – Increased satisfaction with the purchase outcome 	<ul style="list-style-type: none"> – Increased product and market knowledge, leading to <ul style="list-style-type: none"> ○ Future buying efficiencies ○ Personal influences – Increased impulse buying – Increased satisfaction from search and other outcomes

The higher the degree of perceived risk is, the higher the likelihood of active information search and extensive information processing (Schiffman & Kanuk, 2007:533). Two pre-purchase search processes are distinguished: internal and external. During the internal search, consumers search for information within their own memory, knowledge and experience (Lindquist & Sirgy, 2006:35). Past experience, availability and accessibility of product information (e.g., product name, attributes and benefits) are necessary conditions for this information to be retrieved from memory. Regional product (in this research, 'Karoo lamb') information may be retrieved from memory when confronted with a consumption problem (internal search). Having consumed a certain type of lamb and found it a pleasurable experience the memory will assist in future decision making. Accessibility of information stored as a memory is a key determinant of the likelihood that the consumer will speedily identify the regional product ('Karoo lamb') during the pre-purchase search for information. If this information is perceived insufficient for a purchasing decision an external search for information may follow, for instance examining advertisements. The information obtained during the external search leads to an internal search for interpretation and/or elaboration (Van Ittersum, 2002:22).

A consumer can obtain information from several sources:

- **Memory:** past searches, personal experiences and low-involvement learning
- **Personal sources:** family, friends, neighbours

- **Commercial or marketing sources:** advertising, packaging, web sites, salespeople, retailers
- **Public or independent sources:** television, radio, magazines, newspapers, consumer groups
- **Experiential sources:** handling, examining, inspection or using the product (Hawkins, *et al.*, 2007:538)

The usefulness and influence of these sources of information will vary by product and by consumer. Consumers value and respect personal sources most. When consumers search for information within the attribute *price* for instance, they will also be influenced by external sources such as mass media and commercial and non-commercial messages.

Uncertainty, risk, stress or threats to well-being as related to perceived food quality and safety, are potential catalysts for information need arousal and give rise to an active information search by consumers (Verbeke, 2005:352). Consumers have access to information regarding the prices of lamb meat, but have less than perfect access to the quality of lamb meat. Only the producer of lamb meat knows the exact lamb attributes and the product's quality in advance, while consumers do not know and can only determine this through an information search or by experience (Bramley & Kirsten, 2007:75).

Consumer information needs and the management of information are particularly challenging because of the differing needs of consumers, and because there are so many product attributes to provide information about. Information is most likely efficient and effective when it manages to meet the specific needs of consumers who, for instance, face perceived quality and safety uncertainty.

The evaluation of alternatives, as the third step in consumers' decision-making process follows.

2.7.3 Evaluation of alternatives

Alternative evaluation is the process "through which consumers compare and contrast different solutions (products, services, outlets and brands) to the same marketplace problem" (Lindquist & Sirgy, 2006:56) or it can be defined as the act "of identifying alternative solutions to a problem and assessing the relative merits and demerits of each" (Cant, *et al.*, 2006:201). Much of the

effort that goes into a purchase decision occurs at this stage in which a choice must be made from the available alternatives. Consumers' intentions to purchase 'Karoo lamb' are influenced by their attitude towards 'Karoo lamb', relative to competing alternatives which, in turn, are based on consumers' beliefs and expectations about the functional, social and emotional performance of 'Karoo lamb'. These beliefs and expectations largely originate from consumers' product specific and general image of the region (Karoo) and their associations with the product category (meat) to which the regional product ('Karoo lamb') belongs. Consumers then try to establish whether 'Karoo lamb' provides those benefits needed to satisfy their desires. The process by which consumers evaluate and choose among alternatives is illustrated in Figure 2.4.

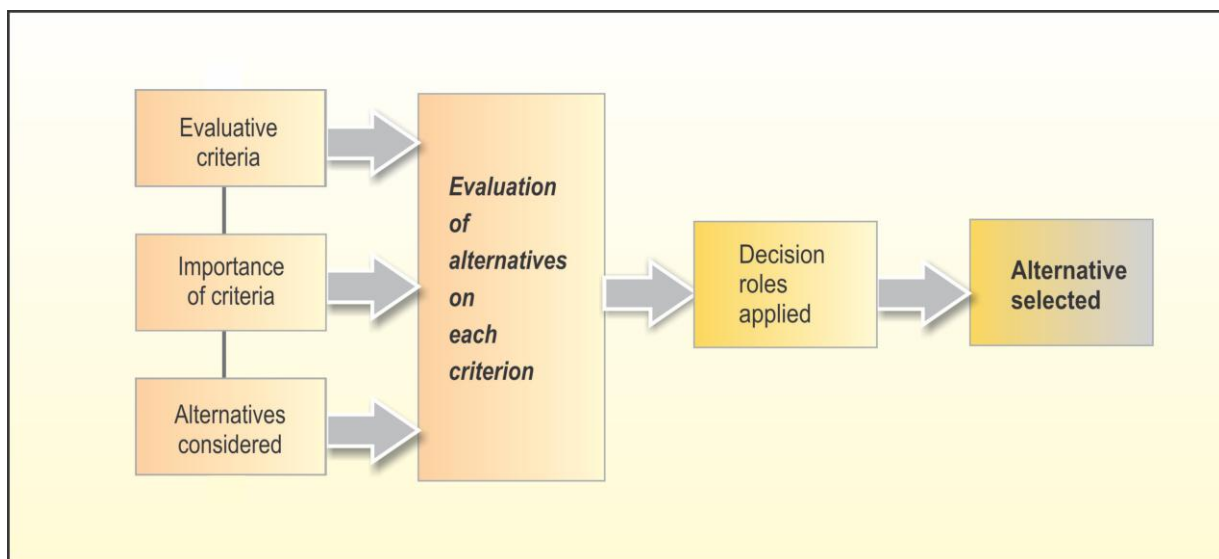


Figure 2.4: Alternative evaluation and selection process
(Hawkins, *et al.*, 2007:566)

Steps in evaluation of alternatives:

- Step 1: **Consumer benefits.** Consumers look for certain benefits that can be acquired by buying a product in order to satisfy a need (Kotler, *et al.*, 2005). The product is seen as a bundle of different product attributes where each attribute has its own benefit that satisfies the need.
- Step 2: **Attribute importance.** Different degrees of importance are attached to each attribute.
- Step 3: **Beliefs about a brand.** Consumers develop a set of beliefs about a particular brand, which is called the brand image.

- Step 4: **Attribute contribution to satisfaction.** It is assumed that each attribute has a utility function for the consumer who expects total product satisfaction to vary with the levels of different attributes.
- Step 5: **New attributes created based on the outcomes of steps 1 to 4.** The consumer creates attitudes towards the different attributes through some evaluation procedure.

The alternatives actively considered during a consumer’s choice process belong to the evoked set. “An evoked set comprises those products already in memory (the retrieval set), plus those prominent in the retail environment” (Solomon, *et al.*, 2006:273). Within the context of consumer decision making, the evoked set refers to the specific brand(s) a consumer considers in making a purchase within a particular product category as can be seen in Figure 2.5. “The alternatives that the consumer is aware of but would not consider buying fall in the inept set, while those not under consideration at all comprise the inert set” (Solomon, *et al.*, 2006:274).

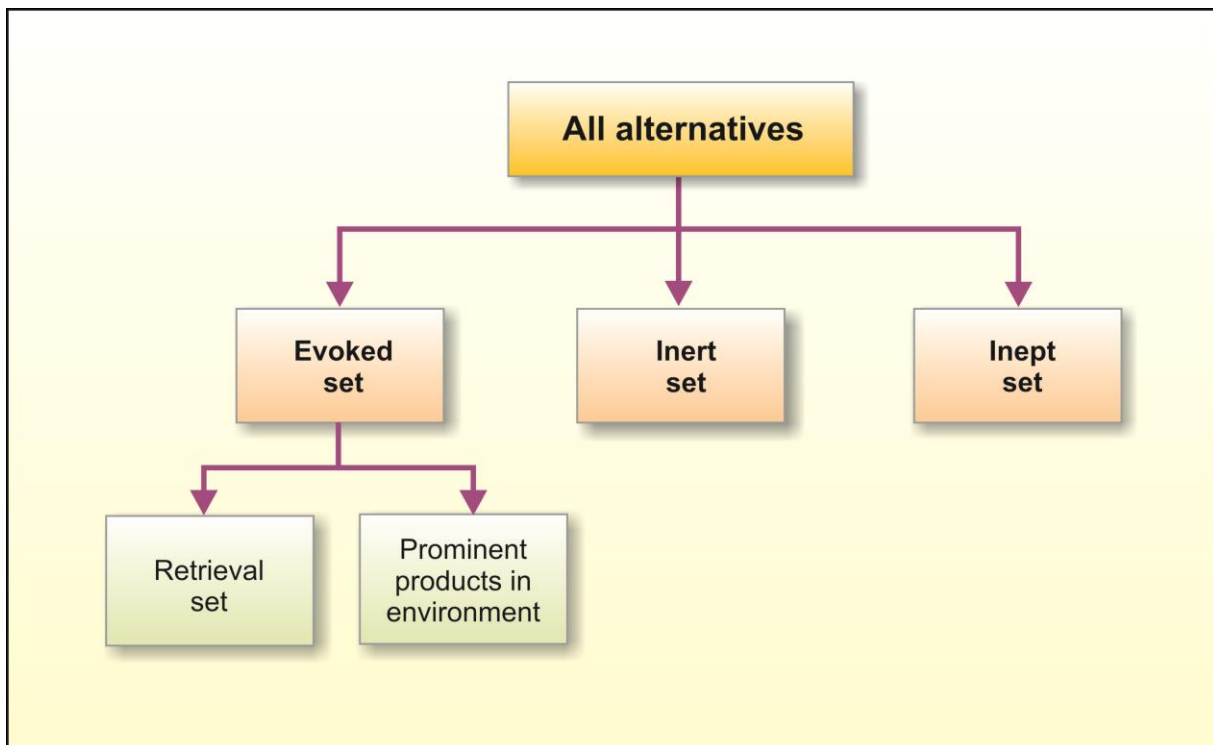


Figure 2.5: Different categories in identifying alternatives
(Solomon, *et al.*, 2006:274)

Thus the consumer has reached the stage where there is a need to evaluate the alternative solutions on the basis of criteria that are relevant and significant for the individual consumer in

the specific situation (Luning, Devlieghere & Verhé, 2006). These criteria are referred to as attributes and every consumer has different beliefs linked to these attributes. Determinant attributes are actually used to differentiate among choices. Every combination of specific beliefs of the attributes and the importance and weight of these beliefs are called consumer preferences. Further in the process they become the purchase intention of each individual.

The selected food product determines the criteria used by a consumer to evaluate the alternatives, at least to some extent (Wierenga, *et al.*, 1997:146). The criteria used for meat products will differ from those used for dairy products. Steenkamp, Van Trijp and Ten Berge (1994) identified the extent of processing, taste intensity, taste evaluation and fatness as the key criteria for meat products. The criteria consumers use to evaluate the alternative products that constitute their evoked sets are usually expressed in terms of important product attributes (Schiffman & Kanuk, 2007:537).

When a consumer eventually makes a product choice from among the alternatives, a number of decision rules may be used. This is done by a consumer to simplify decisions as these rules reduce the burden of making complex decisions. Providing guidelines make the process less taxing (Schiffman & Kanuk, 2007:539). A discussion of the rules that consumers use follows next.

2.7.4 Consumer decision rules

Consumers consider sets of product attributes through information-processing strategies by “using different rules, depending on the complexity of the decision and the importance of the decision to them” (Solomon, *et al.*, 2006:290). One way to differentiate among decision rules is to divide them into those that are compensatory versus those that are non-compensatory (Solomon, *et al.*, 2006:290). Compensatory rules are more likely to be applied in high-involvement situations, allows the decision maker to consider each alternative’s good and bad points more carefully to arrive at the overall best choice. Consumers who employ these rules tend to be more involved in the purchase and thus are willing to exert the effort to consider the entire picture in a more exacting way.

In following a compensatory decision rule, a consumer evaluates brand options in terms of each relevant attribute and computes a weighted or summated score for each brand that reflects the

brand's relative merit as a potential purchase choice. It allows a positive evaluation of a brand on one attribute to balance out a negative evaluation on some other attribute (Schiffman & Kanuk, 2007:539). For example, a positive assessment of the quality of the lamb is made possible by a particular region or 'brand' ('Karoo') and this may offset an unacceptable assessment in terms of the price of the lamb.

Non-compensatory rules are simple decision rules that do not allow consumers to balance a positive evaluation of a brand on one attribute against a negative evaluation on some other attribute. Non-compensatory decision rules are therefore short cuts to making choices (Solomon, *et al.*, 2006:291). For instance, in the case of 'Karoo lamb', the product's possible negative (unacceptable) rating on its price would not be offset by a positive evaluation of its quality. When consumers are less familiar with a product category or are not very motivated to process complex information, they tend to use simple non-compensatory rules.

The next step in the consumer's decision-making process is the consumer's response or purchasing decision.

2.7.5 Purchasing decision or response

The last stage in the process is the choice and behaviour of consumers where purchase intention leads to purchase behaviour (Luning, *et al.*, 2006). Consumer decision is the outcome of evaluation and involves the mental process of selecting the most desirable alternative from a set of options that a consumer has generated. The most suitable choice is the one that comes closest to the evaluation criteria formulated by the consumer and the appropriate decision is dependent upon adequate information (Cant, *et al.*, 2006:202).

In the following part, an overview of the regional food product, 'Karoo lamb' is given.

2.8 Karoo lamb as product

'Karoo lamb' is a meat product linked to the geography, indigenous resources, values and images of the Karoo region in South Africa. The Karoo region is famous for its mutton and lamb that has a distinctive taste and texture.

2.8.1 The production area of 'Karoo lamb'

The Karoo covers almost 50% of the total land area of South Africa. This flat, semi-arid area stretches north-eastwards from the interior and is covered with dry scrubland. The area has very low grazing capacity and the natural pasture for the sheep varies from mixed grass to Karoo shrubs. It can be argued that the particular taste of 'Karoo lamb' is the result of the animals foraging on the fragrant Karoo shrubs or that the distinctive taste results from the free-range conditions under which the animals roam (Kirsten, *et al.*, 2008:1). 'Karoo lamb' is marketed straight from the veld and no additional feed is provided as the animal's meat will then lose its particular taste.

As the unique characteristics of 'Karoo lamb' are the result of specific plant species, vegetation and veld type were used to define the Karoo region (Kirsten, *et al.*, 2008:8). The boundaries of the Karoo are illustrated on the map (Figure 2.6):

- the west and the south border by the boundary between the winter and summer rainfall areas of South Africa
- the Orange/Gariep River on the northern border and
- the eastern border is defined by the Winterberg mountain range



Figure 2.6: Map of the Karoo Region
(Kirsten, *et al.*, 2008)

2.8.2 'Karoo lamb'

The product, 'Karoo lamb' has been part of South African culture for more than a hundred years and is part of Afrikaner and Cape cuisine. Apart from a strong geographical connotation, there is also a cultural link ensconced in the 'Karoo Lamb' concept. (Kirsten, *et al.*, 2008:3). Where place of origin is used as a product attribute, for example the 'Karoo', resources from the area are used to increase the value of the product. These resources could include aspects such as production techniques and species but also resources that are general to the region such as

culture. Kirsten (2006:13) states that lamb from the Karoo is part of our South African heritage and that the word 'Karoo' is a concept that has become synonymous with quality in the minds of the South African consumer.

Six key plant species were identified and selected as the most common and that contribute the most to the specific taste and uniqueness of 'Karoo lamb'. These plants are *Plinthus karrooicus* ("Silverkaroo"), *Penzia spinescens* ("Skaapbossie"), *Eriocephalus ericoides* ("Kapokbossie"), *Salsola glabrescens* ("Rivierganna"), *Pentzia incana* ("Ankerbossie") and *Pieronnia glauca/rosenis humilis* ("Perdebos"). These specific plant species, vegetation and the veld type result in the unique characteristics of 'Karoo lamb' (Kirsten, *et al.*, 2008:8).

There is thus a strong geographical as well as cultural link in the 'Karoo lamb' concept. However, the problem that arises is that there is a lack of certification and guarantee that the product, which is marketed as 'Karoo Lamb', truly originates in the Karoo and consumers can easily be misled as to the true origin of the lamb being sold.

2.8.3 Certification of 'Karoo lamb'

A new 'certified Karoo meat of origin' mark is able to guarantee the origin and quality of Karoo meat but will depend on the co-operation and interest of farmers, abattoirs, meat processors, butchers, retailers and restaurateurs.

The Certification Mark

The mark is owned by the Karoo Development Foundation, an *inter vivos* trust Nr IT1498/2009 established in terms of Section 6(1) of the Trust Property Control Act (Act 57 of 1988). The mark certifies the origin of the mutton and lamb and guarantees that the specifications in the *Rules of Use* of the mark have been complied with as follows:

- The mutton or lamb did originate in the Karoo in that the sheep were born in the Karoo or raised in the Karoo region for at least six continuous months before slaughtering
- Sheep grazed freely on natural veldt and were not raised in feedlots
- The animals did not graze on permanent pastures six months before slaughtering
- No growth hormones were used
- Carcass classification

- Age classes A, AB, B and C
- Fat classes 1 to 6
- Carcass conformation 3 to 5
- The Code of Practice of Good Stockmanship and Animal Welfare Practices have been adhered to
- Meat can be traced back to the farm of origin
- Slaughtering and processing facilities comply with official food safety standards including Hazard analysis and critical control points (HACCP)

Use of the certification mark is restricted to:

- Registered and certified farmers, abattoirs, meat processors, butchers, retailers and restaurateurs who are in compliance with the rules of the certification scheme
- Authorised users are allowed to affix the mark to carcasses, freshly packed meat and derivative products and use the mark on associated packaging, labelling and advertising material
- Inspections and audits are undertaken regularly by a qualified independent organisation appointed by the Karoo Development Foundation

Products are conceived as a set of attributes, of which each attribute acts as a cue contributing to the formation of the consumers' impressions of the product itself. These cues can be split into extrinsic and intrinsic attributes and are discussed in the next section.

2.9 Product attributes as influencing factors

The term 'product characteristics' are mainly used in the food science literature and are those features of a product "which are used as 'technical' indicators for product quality and are (in principle) measurable with standardised analytical (including sensory) methods" (Becker, 2000:163). The term 'product attributes' are more prominent in the consumer behaviour literature and can be described as the features of the product that meet consumers' needs, wants and desires. Product characteristics are the intrinsic product features, but not all product characteristics are important for the consumer. Moreover, the product attributes important for the consumer may not be measurable with indicators. A consumer receives information (cues) on product attributes during shopping and consuming. Cues may be learned by inspecting and consuming the product and the cues are used by the consumer to evaluate the performance of

the product with respect to needs (Becker, 2000:164). Steenkamp in Wieranga, *et al.* (1997:149) describes attributes as the physical characteristics of the product and states that attributes are either concrete like vitamin content or abstract like fattening but in both cases they are directly related to the product itself.

Product attributes can be categorised as search, experience or credence attributes as described in Table 2.6 on page 48. Search attributes can be ascertained prior to purchase, i.e. the packaging of the meat product. Experience attributes cannot be determined prior to purchase but can be detected during and after consumption. Credence attributes cannot be established prior to purchase or during consumption (Nelson, 1970; Darby & Karni, 1973; Anderson, 1994) and the consumer must therefore rely on information transmitted by the media or, for instance by word of mouth. A more recently adopted view of attribute types is one where consumers' perceptions of quality prior to purchase through inspection or research are based on quality cues (Bredahl, Northern & Boecker, 1998). Thus when searching for products to buy, consumers will most often use quality cues to predict the attributes they desire in a product.

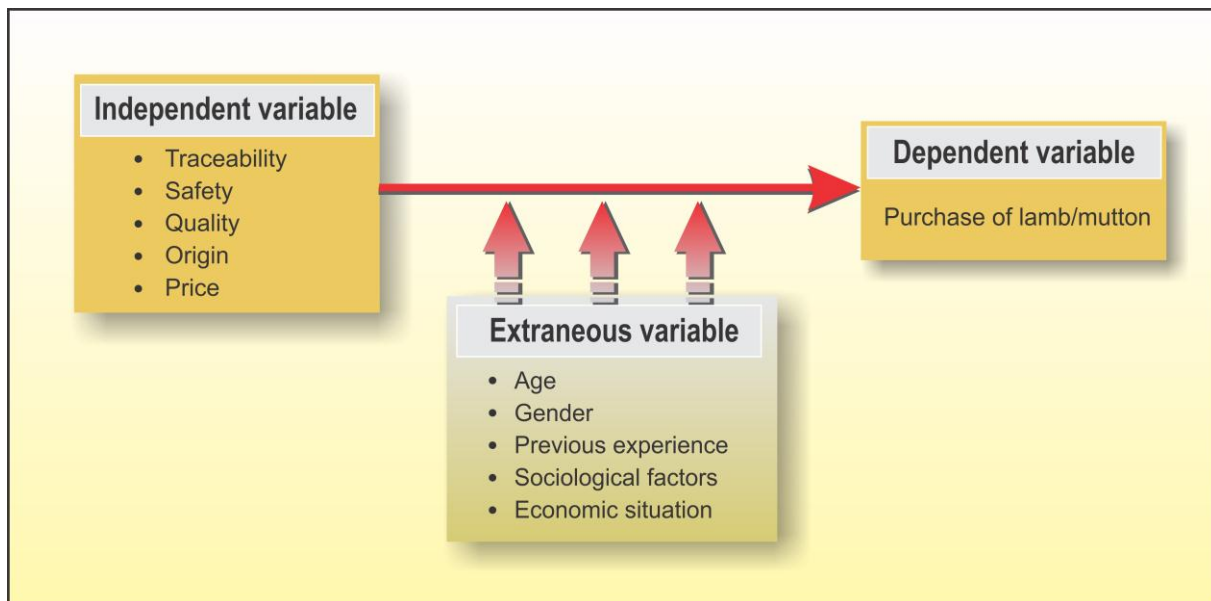


Figure 2.7: The interrelationship between variables
(Adapted from Kumar, 1999)

Product attributes as variables can be measured and differ in their degree of accuracy. In this research terminology was used where the variables are called dependent, independent and extraneous. The dependent variable, the outcome of the change brought by the changes in the independent variables, will be the purchase of the lamb/mutton (Figure 2.7). The extraneous

variables, the other factors affecting every individual in real-life, will be the difference between the consumers evaluating the alternatives; such as age, gender, previous experience, sociological factors and economic status. The independent variables as shown in Figure 2.7 for this research, were considered to be traceability, safety, quality, origin and price.

Both intrinsic and extrinsic attributes influence the consumer in product evaluation by triggering previous knowledge and experiences with the product 'Karoo lamb'.

2.9.1 Intrinsic product attributes

The intrinsic attributes of a product are those that constitute its physical make-up, are specific to each product and disappear when consumed. These are permanent unless the actual nature of the product is altered (Olsen, 1977).

Table 2.3 demonstrates the differences between intrinsic and extrinsic product attributes and gives examples of cues likely to be found in each category for fresh meat. These attributes (intrinsic and extrinsic) should not only be in harmony with each other, but also complimentary to each other in order to ultimately address quality. Quality here means the absence of defects or variation. Intrinsic attributes are higher level attributes directly related to the product, such as quality attributes, for instance, colour and appearance (Kim, 2008:49).

Table 2.3: Classification of Attributes
(Adapted from Visser, 2004:149)

Intrinsic attributes	Extrinsic attributes
a) The physical product or composition of the product	a) They are product related but not part of the physical product itself
b) Cannot be altered without altering the nature (genetic make up) of the product itself	b) By definition they are outside the product
c) Traceability, quality, safety, tenderness and animal welfare	c) Product warranties, certification and seals of approval
	d) Price, product name, brand, logo, origin and labelling are examples of extrinsic cues

A discussion of intrinsic product attributes that can be linked to the product, 'Karoo lamb' follows, starting with traceability.

2.9.1.1 Traceability

Traceability is the word used to describe the physical process of tracing the product through its processing stages to source (Verbeke, 2001:250). Traceability systems represent “the most suitable tool for circulating information on product quality to end consumers and for making the whole supply chain more transparent” (Bertolini, Bevilacqua & Massini, 2006:139).

Definition of traceability

For the purposes of this research, traceability is defined as the ability to maintain a credible custody of identification for animals through various steps within the food chain from the farm to the retailer.

Traceability of a food consists of development of “an information trail that follows the food product’s physical trail” (Smith, *et al.*, 2005:174). It guarantees the immediate recall of food and feed, if applicable, in case of need (safety of food suspect). The International Organisation for Standardisation (ISO) defines traceability as the ability to trace and follow a food, feed, food producing animal or ingredient, through all stages of production and distribution (Regattieri, Gamberi & Manzini, 2007:347).

In the meat sector traceability holds that it is a system that offers the ability to identify an animal, trace its movement throughout its life and subsequently trace the meat products of the animal to the final consumer (Verbeke, 2001:250). As a result, specific food quality and safety levels can be guaranteed or assured for other chain participants and ultimately the consumers (Verbeke, 2001:250). In fact, the words transparent and assurance can be interchangeable with traceability.

Importance of traceability

As food production and marketing have been removed from direct consumer control, traceability of animals and animal products has assumed increased importance for consumers and the organisations that service the needs of consumers (McKean, 2001:363). Heightened awareness of food-related safety issues among today’s food consumers, coupled with a more educated public, is driving the demand for more information about the vertical food supply chain and

specifically, the origin and handling of the basic commodities and food products generated and consumed throughout the world (Smith, *et al.*, 2005:175). According to Opara and Mazaud (2001:243), even when traditional food quality assurance systems are implemented, consumers also demand that such systems must permit the traceability of the product along the supply chain.

Concerns about food safety and quality have increased at both governmental and consumer level. Interest has primarily focused on the control of microbes, parasites, viruses, chemical additives and contaminants that can be dangerous to humans when introduced into the food supply, either during production or processing (McKean, 2001:364). Traceability has become more than a food production buzzword, but rather “a necessary component of the food production process”. Traceability adds value “to the other quality and safety management strategies by providing the communication linkage for identifying, verifying and isolating sources of non-compliance to agreed standards and consumer expectations” (Opara & Mazaud, 2001:243).

The two components of traceability

Product traceability requires a transparent chain of custody (product ownership) to achieve traceability (through unique animal or product identification systems) and to complete the desired information transfer functions (McKean, 2001:364). An extensive form of meat traceability is the ability to follow products forward from their source animal (birth or ancestry) through growth and feeding, slaughter, processing and distribution, to the point of sale or consumption (or backward from the consumer to the source animal). Animal identification (ID) is only one component of meat traceability. Traceability is, in fact, the more comprehensive concept of tracking the movement of identifiable products through the marketing chain. The key to any traceability system is the number of ‘ownership’ changes that the product passes through before it reaches the consumer. Every change in ‘ownership’ becomes another link in the traceability chain and increases the potential to compromise the reliability of any system (Shackell, 2008:2136).

Traceability as a tool

Traceability can be an important tool to help to establish the authenticity of food and to check that claims made by producers are true (Van Rijswijk, *et al.*, 2008:453). Table 2.4 illustrates traceability as such a tool and showcases its features.

Table 2.4: A summary of the features of a product differentiation system (traceability)
(Adapted from Smyth & Phillips, 2002:33)

Overall management	Traceability
<ul style="list-style-type: none"> – Objective – Status – Lead stakeholder – Regulatory agency involvement – Information – Risk – Information flow – Supply chain focus – Penalties for failure in product market – Testing/auditing 	<ul style="list-style-type: none"> – Product safety – Voluntary or mandatory – Commodity group, standards organisation or regulator – Consumer fraud – Asymmetric – Moral hazard – One-way – Upstream – Consumer fraud charges; exclusion from product category – 3 rd party / standards organisation
Production stage features	
<ul style="list-style-type: none"> – Production arrangements – Production controls – Premiums for producers 	<ul style="list-style-type: none"> – Membership in quality standard – Process standards adopted and record keeping – Short term
Processing stage features	
<ul style="list-style-type: none"> – Enforcement – Quality criteria based on – Tolerance levels – Testing/auditing 	<ul style="list-style-type: none"> – Collective – Processes (e.g. ISO) – Performance based – 3 rd party
Retail stage features	
<ul style="list-style-type: none"> – Provides access to – Information provided to – Final market price premiums – Labelling 	<ul style="list-style-type: none"> – Product categories – Regulator, retailer or processor – None – Quality standard

In the differentiation of a product of animal origin (authenticity) many of the desired attributes are introduced at the production level and cannot be added during processing. Traceability, process transparency and third-party assurance are therefore central to gaining and retaining consumer confidence (McKean, 2001:364). In the case of ‘Karoo lamb’, consumers can be misled as to the true origin of the lamb being sold. Hence the reputation and image of the product, ‘Karoo lamb’, has the danger of being usurped for profit due to the misappropriation of the names of geographical regions such as ‘Karoo’. Currently there is no certification and guarantee that the product, which is marketed as ‘Karoo lamb’, truly originates from the Karoo. South Africa

protects geographical indications under trade mark laws. Both trade marks and geographical indications serve as distinctive signs whose purpose is to distinguish products and acknowledge the link between a product and its origin. Trade marks are signs that identify the proprietor of the mark and the goods or services offered and are therefore not limited by any territorial link. Geographical indications identify goods as originating from a particular geographical area.

Traceability may be utilised to backup product claims such as origin and quality labelling. In short, products that make special claims may benefit from traceability as a means of supporting the claims by making them verifiable, for example, when related to a premium quality or designated origin, issues about which consumers are concerned or interested in (Van Rijswijk, *et al.*, 2008:452).

Development and implementation of traceability

Traceability systems are mainly being developed and implemented to improve food supply management, to facilitate tracing back to ensure food safety and quality, and to differentiate and market foods with subtle and undetectable quality attributes (Smith, *et al.*, 2005:175).

Coff, Korthals and Barling (2008) list five objectives for traceability in food: one of the objectives shows that the provenance of a food product can be assured through traceability.

- Risk management and food safety
- Control and verification
- Supply chain management and efficiency
- Provenance and quality assurance of products
- Information and communication to the consumer

Identification, traceability and verification

The terms identification, traceability and verification need to be differentiated. It is easy to identify traceability but very difficult to accomplish. It is even more difficult to verify identity, traceability and claims about livestock and meat. Animal traceability is completely dependent upon successful identification of individual animals or groups, their first appearance and origin-and-movement records thereafter (Smith, *et al.*, 2005:177). In some cases, like 'Karoo lamb', verification is required. 'To verify' is defined as "to prove the truth or accuracy of, or to

substantiate by the presentation of evidence or testimony” (Smith, *et al.*, 2005:177). Source-verification refers to the documentation of location-of-the-animal history from birth to slaughter. Production practice verification requires that all claims (e.g. ‘not fed antibiotics’, ‘no added hormones’, etc.) made be independently audited (Smith, *et al.*, 2005:187). In South Africa the South African Meat Industry Company (SAMIC) performs inspection and certification processes for the red meat industry also dealing with traceability.

Benefits of traceability

The benefits perceived from traceability are fivefold.

- It enables the industry to provide consumer assurance about the sources and safety of food
- Traceability also allows for identification of the source of infected or substandard products
- It allows for the control of diseases and the monitoring for residues
- It verifies support measures
- It satisfies the requirements of labelling regulations with reference to the potential development of brands (Verbeke, 2001:251)

Traceability in the supply chain

Traceability connects and identifies all those involved in the supply chain who take on the responsibility for ensuring the quality and safety of food. This allows for the identification of the product at each step in the food chain to the end user, the consumer with regard to physical flow, data flow and/or financial flow, as shown in Figure 2.8.

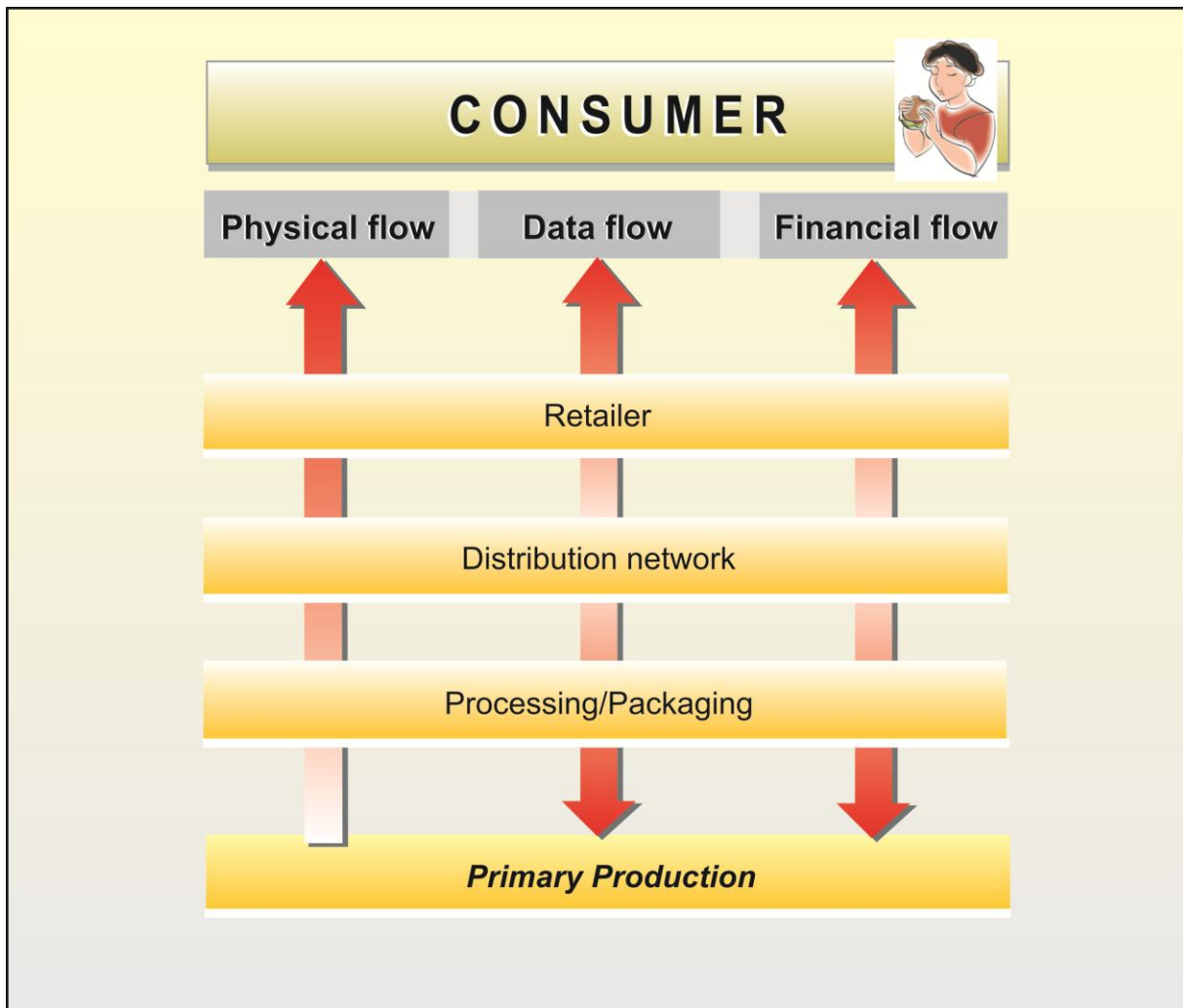


Figure 2.8: Generic food supply chain model
(Folinas, Manikas & Manos, 2006:623)

Once converted from an animal to an item of food, traceability depends on:

- Identification of the item or batch
- Records of the source and distribution of the product (Pettitt, 2001:589)

Although parallels exist with the traceability of livestock, the audit trail for food items becomes increasingly complex, as the items are mixed, processed or stored for long periods. The first prerequisite for the continuity of identification through the food chain is maintenance of a link between the animal and primary product.

The test of a traceability system is the ability to effectively remove produce from sale and consumption, named a 'product recall', if any doubt arises as to the status of the produce. In

addition to providing internal audits, retailers employ third parties to spot-check traceability by purchasing products at random in the stores and verifying the source through the batch codes on the label (Pettitt, 2001:594).

The pillars of a traceability system

Traceability can be divided into two key functions, tracking and tracing as seen in Figure 2.9. Tracking can be defined as the ability to follow the path of an item as it moves downstream through the supply chain from the beginning to the end. Tracing is the ability to identify the origin of an item or group of items, through records, upstream in the supply chain (Schwagele, 2005:166).

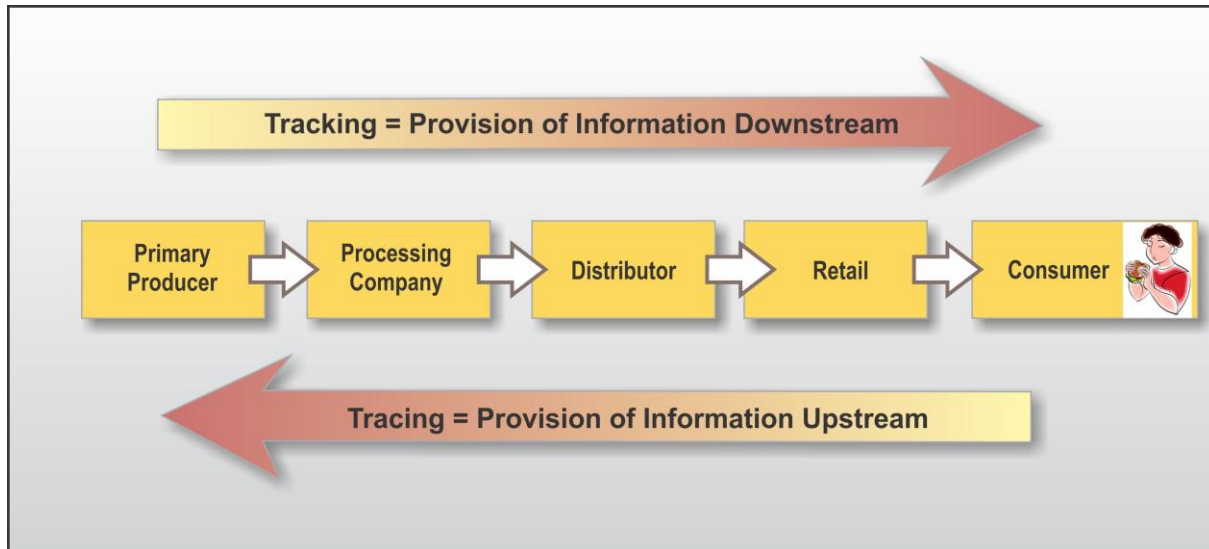


Figure 2.9: Tracking and Tracing along the Food Chain
(Schwagele, 2005:166)

A food traceability system is based on 4 pillars:

- *product identification* – noting information such as dimensions, volume, weight, perish ability, packaging or cost;
- *data to trace* – in terms of number, typology, data storage requirements or degree of detail;
- *product routeing* – investigating the production cycle, activities, equipment, storage systems; and
- *traceability tools* – ensuring data accuracy, data reliability, observing the degree of automation, company knowledge and cost of the system (Regattieri, *et al.*, 2007:349).

The step of '*product identification*' is fundamental as physical characteristics such as volume, weight, dimensions and packaging have a direct impact. The second pillar concerns the '*data to trace*'. The characteristics of the information that the system must manage, for example related to kind and number, are absolutely relevant to correct design. A product traceability system must take the production process into account, so the third pillar is '*product routeing*'. The system must record 'product life' along the supply chain, taking production activities, movement and storage activities into account. Data accuracy and reliability is required to guide the selection of the '*traceability tool*'. Obviously, cost is a relevant factor and must also be taken into account (Regattieri, *et al.*, 2007:351).

Considerations before implementing traceability systems

Part of the documentation used for traceability should include a flow chart of the processes in the supply chain from production to plate similar to Figure 2.9. This pictorial form of documentation facilitates the drafting of other supporting documents and makes it easier to understand, apply and demonstrate the flow of the food through the chain. Using such forms of visual representation facilitates auditing the traceability system for validation and verification (Opara & Mazaud, 2001:244). A basic road map as the one in Table 2.5 is also useful in implementing a functional traceability system for a food product.

Table 2.5: Basic road map of food traceability
(Opara & Mazaud, 2001:245)

Basic roadmap of food traceability
1. Draw a flow chart of the product supply chain, from farm to plate and include links to material inputs such as feed
2. Appoint a quality assurance officer who is responsible for product traceability
3. Conduct a hazard analysis of the supply chain
4. Document the reasons for embarking on the traceability of the product
5. Write down what information/data must be recorded and traced back at each step in the supply chain
6. Specify who will be responsible for collecting and recording the data
7. Develop a unique bar code or labelling system for easy identification of the product
8. Document how the trace-back is to be carried out (include a trace-back diagram)
9. Test, validate and verify the traceability system
10. Document all decisions and actions

The next intrinsic product attribute to be discussed that can be linked to the product, 'Karoo lamb' is product quality.

2.9.1.2 Product quality

The definition of food quality is a subjective matter, differing from person to person. The International Organisation of Standardisation (ISO) defines quality as “the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs”. Rather similar is the definition used by Becker (2000:159): “Quality is the entirety of features and characteristics of a product, which refers to the fitness to fulfil given needs”.

Meat quality is a complex concept that is frequently measured using objective indicators related to the nutritional, chemical, microbiological and physiological characteristics. The concept of product quality can be analysed under two main different perspectives: the objective quality approach pursued in food sciences (product characteristics approach) and the subjectively perceived quality approach (product attribute approach) as pursued in the consumer behaviour literature (Becker, 2000:158). Objective quality refers to the technical, measurable and verifiable quality of products and services, processes and quality controls. In South Africa objective meat quality is managed by means of a meat classification system based on animal age, carcass fat content and conformation (Davel, Bosman & Webb, 2003:206). Subjective or perceived quality refers to the consumers’ value judgments or perceptions of quality (Espejel, Fandos & Flavian, 2007:683) and is related to the product’s ability to provide satisfaction.

Perceived product quality

Perceived quality can be classified in two groups of factors that allow the consumers to evaluate the products: intrinsic attributes and extrinsic attributes (Espejel, *et al.*, 2007:683). The factors influencing perceived meat quality are intrinsic cues like convenience, safety and acceptability of sensory characteristics, and extrinsic quality cues like the colour of the meat, the visible fat and the cut because fresh meat is largely an unbranded product (Davel, *et al.*, 2003:206).

Consumers receive information on product attributes while shopping and consuming as cues to distinguish the information from the information supplied by the media and other publicity sources. Cues may be learned by inspecting and consuming the product. In the product attribute approach, cues are used by the consumer to evaluate the performance of the product with respect to these needs (Becker, 2000:164). This allows us to distinguish three categories of perceived quality based on product attributes as seen in Table 2.6:

- **Search quality** (quality in the shop). This category refers to intrinsic and extrinsic product attributes that serves as cues at the moment the purchase is made and are important for quality selection.
- **Experience quality** (eating quality): These are intrinsic attributes that become available only when the product is used or consumed and are important for the consumers’ perception of organoleptic quality.
- **Credence quality** (reputation quality). This category represents both intrinsic and extrinsic attributes that are of concern to the consumer but are not cued in the buying or consuming process. The consumer must therefore rely on information transmitted by the media, word of mouth and other sources.

Table 2.6: Typology of Attributes and Quality Signals
(Luth & Spiller, 2005)

Typology	Search Quality	Experience Quality	Credence Quality
Suitable Quality Signals	Intrinsic: Colour, leanness, marbling Extrinsic: Packaging, design, brand/label, appearance, price	Intrinsic: Colour, leanness, texture, gristle, tenderness, smell, flavour, juiciness	Intrinsic: Freshness Extrinsic: Origin, producer, guarantees, organic

Food producers differentiate products over a wide range of sensory and eating qualities related to consumption such as taste, texture and nutritional content. If product quality cannot be observed in advance, consumers tend to use the quality of products offered by the same producer in the past as an indicator of future quality experiences. A product’s reputation thus embodies expected quality, and individuals extrapolate past behaviour to make inferences about likely future behaviour (Bramley & Kirsten, 2007:75).

Determined product quality

Determined quality and safety are part of the intangible characteristics of a food product and help to give more value to the product and to differentiate it. Traceability is an essential tool for ensuring both production and product quality, described as ‘determined quality’. The opportunity to connect traceability to the whole documentation and control system represents an effective means for boosting the consumer’s perception of a food products’ safety and quality. In this way

perceived and determined quality as related to consumer perspectives, are combined thus increasing product trust and brand loyalty (Bertoloni, *et al.*, 2006:137).

The next intrinsic product attribute discussed is product safety.

2.9.1.3 Product safety

Food safety can be understood as the inverse of food risk or the assurance that a food will not cause harm to the consumer when it is prepared or eaten in accordance with its intended use, according to the World Health Organization (2009).

Consumers perceive risk in their own manner and it determines their responses to food risk. Indeed, the individual's perception of risk is dependent on a number of factors: how an individual gathers and processes information about an event; how the level of risk associated with such an event is perceived; and personal experience of the risk. Consumer risk assessment thus depends on the individual's own judgment of the event.

Consumers look for signs (identification marks/markings) and certification that guarantee safety to reassure them. Knowledge of the brand, the approval of bodies through certification, their experience with the brand, information on the package or label, well-identified origin and traceability back to that origin, are measures that signal safety for consumers. Traceability is generally viewed as a potential risk management tool for public health purposes, as it allows consumers to have targeted and accurate information concerning products (Van Rijswijk, *et al.*, 2008:453). Knowing that the traceability chain is in place for 'Karoo lamb', consumers will also know that food safety is guaranteed and that it is possible to trace the lamb meat back to its producer, should there be a problem. As breakdowns in food safety can have far-reaching repercussions, it is much easier and more straightforward if the food product in question can be identified, tracked and verified.

A traceability system addresses food safety concerns for consumers through its aims. Caporale, Giovannini, Francesco and Calistri (2001:374) state that to imagine that acceptable food safety systems can exist in the absence of proper traceability of animal feed, food products and food ingredients, is unreasonable. Globally consumer demand for safe food, and meat in particular, is the greatest driving force for the introduction of a variety of systems for traceability of animals

and animal products (McKean, 2001:364). The identification and documentation of the traceability of animal products through an integrated production chain control system has the following aims:

- To increase confidence in product safety
- To control public health risks derived from product use and consumption
- To facilitate disease control procedures, including sampling
- To identify the possible source of contamination
- To facilitate the product recall procedure (Caporale, *et al.*, 2001:374)

Food safety policy should cover all sectors and all participants in the food chain with particular regard for their role and involvement (Banati, 2003:91), as consumers tend to expect the government, the food industry, producers and retailers to be responsible for the safety of the food they consume. Challenges for consumers that are associated with meat consumption include:

- residues of agricultural chemicals
- the safety and quality of products designated as organic or natural
- humane treatment of animals, animal and food product identification
- traceability issues and
- food-related animal health issues

These challenges become more important and complex, due to changes in animal production, product processing and distribution as well as increased interest, awareness and scrutiny of food-related issues by consumers (Sofos, 2009:2452). The management of these challenges should therefore be based on an integrated effort and approach that applies from the beginning, the producer, through the processor and distributor to the retailer. From farm to fork, all those in the food supply-chain (as listed in Table 2.7) have to find a good balance between possibilities, requirements and obligations in order to ensure consumers' health and food safety.

Table 2.7: Role of the participants in the food chain
(Banati, 2003:91)

Role of Government	Role of the Food Industry
a) Provide up-to-date background based on scientific evidence	a) Provide safe and wholesome food
b) Properly enforced legislation	b) Primary responsibility for food safety
c) Effectuated and efficient co-ordination, enhance multi-agency efforts	c) Implementation of quality assurance and management systems
d) Risk management	d) Risk-based approach
e) Proactive approach	e) Adoption codes of hygienic practices
f) Precautionary measures	f) Voluntary measures
g) National food safety policies	g) Expand preventative safety measures
h) Risk communication	h) Training and education of food handlers
i) Public education, training	i) Caution when applying new technologies
j) Promotion of voluntary measures	j) Ensure consumer understanding (clear and easily understandable information)
k) Epidemiological surveillance of food-borne diseases	k) Maintain consumer confidence
l) Monitoring system	l) Risk communication
m) Transparent decision-making	
n) Early warning/rapid alert system	
o) Increase research to assess risks	

Concerns about food safety and quality have increased at both governmental and consumer levels and expanded to include animal welfare and environmental production practices. Interest has primarily focused on control of microbes, parasites, viruses (pathogens) as well as chemical additives and contaminants that can be dangerous for human consumption, irrespective of the source of the contamination (McKean, 2001:363). Globally the food supply system has changed and large scale integration means efficiency but also that a single mistake can turn into a large scale disaster. The main factors influencing food safety are listed in Table 2.8.

Table 2.8: Factors influencing food safety
(Banati, 2003:89)

Changes In
a) World trade
b) Food supply system
c) Health and demographic situation
d) Social situation and lifestyle
e) Health system and infrastructure
f) Environmental conditions

Animal welfare as intrinsic product attribute is discussed next.

2.9.1.4 Animal welfare

Animal welfare means keeping animals healthy and free of suffering. Quality of life issues, such as food ethics (specific values held by consumers towards organic and conventionally produced food) cannot be verified by consuming the product. Consumers who are typically concerned about animal welfare and the environment (green) issues generally hold strong views on issues such as animal health, environmental benefits and animal welfare and, as such, credence factors will influence their decision making (Weatherell, *et al.*, 2003:234). Methods used in intensive animal farming may also increase the chance of diseases that are bad for people and animals, and may contribute to the development of mad cow disease (BSE).

There is a growing interest in animal welfare standards associated with production (Schröder & McEachern, 2004:169) and for consumers it is clear that “humane farming is sustainable, sustainable farming is humane” (Appleby, 2005:4). Animal welfare is recognised as an important component of perceived quality assurance for consumers of primary products of animal origin. Consumers value information that is supplied about animal treatment and see this as a desirable condition when purchasing mutton/lamb (Schnettler, Vidal, Silva, Vallejos & Sepulveda, 2009:164).

International research has identified five basic freedoms as part of animal welfare policy that are accepted as the basis for the ethical and humane treatment of animals. These provide a acceptable welfare status for the confinement of livestock and the criteria require that livestock is:

- Free from hunger and thirst via the availability of fresh water and the appropriate feed.
- Free from abnormal discomfort via the provision of adequate shelter.
- Free from abnormal pain, injury or disease via the provision of appropriate prevention or alternatively, rapid diagnosis and treatment of normal pathological conditions.
- Allowing for the freedom to express natural behaviour by providing sufficient space in suitable facilities and the company of the animals’ own kind.
- By providing conditions and care that avoid undue suffering and thus permit freedom from fear and distress (UK Farm Animal Welfare Council, 1993).

When intrinsic cues do not provide the consumer with useful information, perhaps due to time constraints, the extrinsic cues are then used as quality indicators. A discussion of the extrinsic product attributes of the product, 'Karoo lamb', follows next.

2.9.2 Extrinsic product attributes

Extrinsic attributes, such as its name or the brand image, relate to the product but are not a physical part of the product. They are lower-level cues that can be changed without changing the product, such as price and country of origin. Extrinsic attributes can be judged prior to consumption or use, while nevertheless being related to the product. It can also be seen as forms of risk reduction information that are used when purchasing products (Kim, 2008:49). The different characteristics of extrinsic product attributes are described in Table 2.3.

A discussion of the extrinsic product attribute 'labelling' follows next.

2.9.2.1 Labelling

Product labelling can be seen as a means to provide product-specific information to stakeholders involved in the food chain, and reduce perceived quality uncertainty faced by consumers in their food-choice decision process (Verbeke & Roosen, 2009:21). Indications on food labels, such as quality marks, origin labels or geographical indications, may represent some value for consumers because they may be perceived as signalling a particular product specification and quality level that relate to authenticity and genuineness. In cases where uncertainty about quality or safety is elevated and consumer involvement increases, labelling information can become more dominant as a means to inferring product quality (Verbeke & Roosen, 2009:22). In the case of traceability labelling it assures the consumers about the feasibility of tracing back the origin in the event of a food safety crisis.

Labels are extrinsic information cues that allow consumers to assume product quality status and to form quality expectations. Labels often signal a particular credence quality. Through their signal value and visibility on product packages, such labels may reach the status of a search cue, that is, an information cue that consumers actively search for during their shopping and purchasing decision processes (Verbeke & Roosen, 2009:23). Consumers typically weigh the

perceived value of a label or a specific information cue on a label against other cues and product attributes as they make their decisions.

Since consumers cannot judge experience attributes of food quality until after they have bought and used the product, there is always a risk of purchasing a product that will not satisfy the consumer. In order to reduce the chance of that happening, consumers try to learn about the product in various ways, one being informational labelling and information displayed on the product packaging (Dimara & Skuras, 2005:92). Fresh food products have been particularly prone to origin and quality labelling as an alternative product differentiation strategy to branding.

A product label can be viewed as an instrument that regulates the presentation of product-specific information to a consumer. Claims, illustrations and symbols convey important information on what a consumer can expect of the product from the package (Carneiro, Minim, Deliza, Silva, Carneiro & Leao, 2005:276). As there is no insignia, no certification and no guarantee for consumers in South Africa that the lamb truly originates from the Karoo when it is sold as 'Karoo lamb', consumers can be misled as to the true origin of the 'Karoo lamb' that they purchase or consume as there are no guarantee cues on the labelling of the lamb/mutton.

A discussion of the extrinsic product attribute 'origin' follows next.

2.9.2.2 Regional product (Origin)

All agricultural products have specific geographic origins. By highlighting the place of origin, an agricultural product becomes differentiated from competitive offerings, thereby enhancing its commercial appeal and competitiveness (Tregear, Kuznesof & Moxey, 1998:384). However, it can be asked what makes a regional food regional? A food product produced in a particular region and labelled as such, like 'Karoo lamb' qualifies as a regional food. The importance of foods associated with a particular locale can be attributed to the climate and geomorphology of the region and the resultant local resources such as water and the indigenous crops (Kuznesof, *et al.*, 1997:201).

The term "typical" is applied to products that have a close link with a particular geographical area, due to the fact that raw materials used are specifically procured from the area in question. This gives the product certain unique characteristics that are not repeatable elsewhere

(D'Amico, 2004:794). Among the elements that express the product-territory link, the main one is geography, amongst other variables, the climatic conditions that contributes to giving the product its specific attributes. On closer examination, however, there are two other areas that too seem to have a particular influence: history and culture (D'Amico, 2004:794). Typical products are part of the local heritage as the production methods for instance have become deep-rooted in the territory. Local products also have an extremely important cultural dimension, since they express the way of life and mentality of people living in a particular area. For a product to be considered “typical”, therefore, it is not simply a matter of it originating from a particular geographic area. It should rather reflect a deep-rooted relationship with the territory in terms of the all the aspects outlined in this discourse.

Past research shows that the origin of food influences consumer decision making (attitudes, evaluation, willingness to buy, choice) in substantive and complex ways. Consumers who identify themselves strongly with a given region are willing to pay significantly more for products from that region (Luomala, 2007:122).

‘Karoo lamb’ is a typical product that has developed over time. A consumer’s intention to purchase depends eventually on how the “typical” product meets or satisfies all circumstances of its use. Consumers tend to differentiate between products from different countries or areas, a phenomenon known as the country-of-origin effect. This effect is rooted in the image the consumer has of specific products, to the point where consumers use origin as a cue, for example determining product quality, either alone or in conjunction with other product information (Schnettler, Ruiz, Sepúlveda & Sepúlveda, 2008:372).

Branding as an extrinsic product attribute is discussed next.

2.9.2.3 Branding

Brands take on the function of information surrogates or carriers. As consumers exhibit uncertainty in forming perceived quality expectations for meat, branding appears as an obvious way in which a seller can identify a superior quality product and thus reduce the level of consumer uncertainty, and encourage consumers to pay a premium for better quality (Grunert, Bredahl & Brunso, 2003:268). Consumers are receptive to the brand signal and use it in the formation of perceived quality expectations. Brands enhance product recognition and, as quality

signals, brands are especially useful for communicating and guaranteeing a high level of unobservable product quality such as taste.

Branding in the fresh red meat sector, however, can present challenges. The reasons are summarised in Table 2.9.

Table 2.9: Arguments against branding in the fresh meat industry
(Luth & Spiller, 2005)

Argument	Reason
a) Unpacked product	Because of the predominance of sales over the counter branding is neither necessary nor possible
b) Natural product	The meat quality can not be standardised enough for the needs of a brand
c) High quality risks	Crises such as BSE scares affect all brands, also the brand producers
d) Consumers as co-producers	The lack of cooking skills of many consumers leads to disappointing taste experiences which rubs off negatively on the brand
e) Lack of financial power	The low rentability of the industry rules out expensive advertising campaigns

If consumers like the product they experienced, they will repurchase the brand. If a branded product develops a history of constant and reliable quality, the brand will become a symbol for a certain perceived quality positioning in the mind of the consumer. Consumers may then develop a preference for the brand, resulting in brand equity (value) (Grunert, *et al.*, 2003:267).

A discussion of the extrinsic product attribute 'price' follows next.

2.9.2.4 Price

Consumers will only consume those goods and products that fulfil their specific demand requirements. Factors that influence the demand for meat are mainly categorised as economic or non-economic. In other words, consumers will generally increase their consumption of meat when real income increases, whilst consumption will decline when price relative to other food, rises. Non-economic factors include issues pertaining to health and safety, convenience, perceived quality, animal welfare and the environment. Taljaard, *et al.* (2006:223) came to the conclusion that the effects of non-economic factors have become more important recently than they were in the past due to consumers' concerns about safety and perceived quality.

As consumers are extremely price sensitive they must be made aware of the existence and meaning of traceability and its value added benefits in an environment where safety concerns and health risks are legitimate. Before the series of food scares was experienced, consumers were used to the idea of 'cheap food' (mass produced) and did not expect to pay a premium for animal produce reared in a more traditional manner. Through traceability a product differentiates itself and justifies a higher price. 'Karoo lamb' is an authentic, region-specific product with unique characteristics. Studies have shown that consumers are willing to pay (WTP) a premium for products that are linked to a determined quality and safety (Botonaki, Polymeros, Tsakiridou & Mattas, 2006:80). In fact, the higher the perceived quality and prestige image of the product, the lower the price sensitivity (Brijball, 2003:94).

The question arises whether consumers will be prepared to accept an increased price (willingness-to-pay) due to traceability of meat, and whether they will be willing to absorb the increased costs of traceability to retailers. There are three possible reasons why consumers may be reluctant to pay the increased price: first, consumers take the safety of the product for granted as a matter of course and thus are not willing to pay a price premium for it; second, consumers increasingly have concerns regarding food products, but not at the levels at which they would be willing to pay extra to address those concerns; and third, in consumers opinion, traceability only is not sufficient to guarantee food safety or quality (Lichtenberg, Heidecke & Becker, 2008).

Place of purchase as extrinsic product attribute is discussed next.

2.9.2.5 Place of Purchase

Consumers can purchase meat products from various outlets like supermarkets, butcheries, co-operative societies, directly from farmers or farm shops. Supermarkets and butcheries, however, represent the two most important outlets. Purchasers of food products attach high levels of importance to place of purchase and availability (Radder & le Roux, 2005:588). A segment of consumers who can be typified as 'concerned meat consumers' experience high levels of concern related to meat safety. These consumers have a preference for butchers as suppliers of fresh meat as this fits with their search for and perceived view of better quality meat and gives personal reassurance (Verbeke & Vackier, 2004:166). Consumers tend to believe

that meat bought from a butcher is of better quality than meat bought from a supermarket (Grunert, 2006:151).

2.10 Summary

The first part of this chapter dealt with some fundamental aspects of consumer behaviour theory. The discussion was based on the Schiffman and Kanuk (2007) model of consumer behaviour, with a specific focus on the various stages of consumer decision making within the context of consumer behaviour. The consumer decision-making process signifies goal-striving behaviour that is not just a single activity but a sequential and repetitive series of psychological and physical activities ranging from problem recognition to post-purchase behaviour.

The second part of chapter two covered a review of the literature on 'Karoo lamb' and the intrinsic and extrinsic product attributes that consumers take in consideration when selecting/purchasing 'Karoo lamb'. The extrinsic attributes of a specific food product like 'Karoo lamb', such as the place of origin, the traditional product image and the know-how associated with production are unique distinguishing features that are difficult to imitate. Traceability (the ability to maintain a credible custody of identification for animals involved through various steps within the food chain from the farm to the retailer) is discussed in detail. The process can be seen as a sub-system through which safety and food product quality can be guaranteed. No research prior to this study was conducted on the role and contribution of traceability as it relates to 'Karoo lamb' and on the influence of traceability and its perceived benefits on the decision-making process of consumers regarding 'Karoo lamb'.

CHAPTER 3

RESEARCH PROCEDURE (PHASE 1) AND RESULTS OF AUDITING

3.1 Introduction

The South African red meat industry boasts facilities of high level standards to support the industry from farm to retail. In recent years the meat industry has faced many challenges that have resulted in decreased consumer confidence and, for that reason, certification procedures have gained great importance in the international agribusiness sector.

An audit is not an inspection, as an inspection is used to detect deficiencies in a product or operation, whilst the main objective of an audit is to permit the auditor/s to make a statement regarding their judgement of the auditee's compliance with a specific standard and the adequacy of existing controls for maintaining conformance (Gombas, 2005:1). Once an animal is converted into an item of food, traceability is dependent on the identification of the item or batch and records of the source and distribution of the product, and these can only be verified through auditing.

The only way to verify the characteristics of credence attributes such as freshness and origin, is through inspections carried out, for instance, by external organisations or public authorities. The likelihood of detecting producers or retailers falsely claiming specific credence qualities depends on the amount of monitoring in the respective product category (Albersmeier, Schulze, Jahn & Spiller, 2009:927). Consumers can be misled as to the true origin of the lamb and mutton being sold, and only through official audit processes, can the origin of the lamb/mutton be verified and guaranteed.

3.2 Auditing in the meat industry

An audit can be defined as a systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled.

The following important characteristics and conceptual elements of an audit can be derived. Auditing is a **process** that needs to be planned and controlled to provide a reliable outcome.

The audit process needs to be **systematic** as seen in Figure 3.1, following well-established procedures so that different auditors would come to the same conclusions.

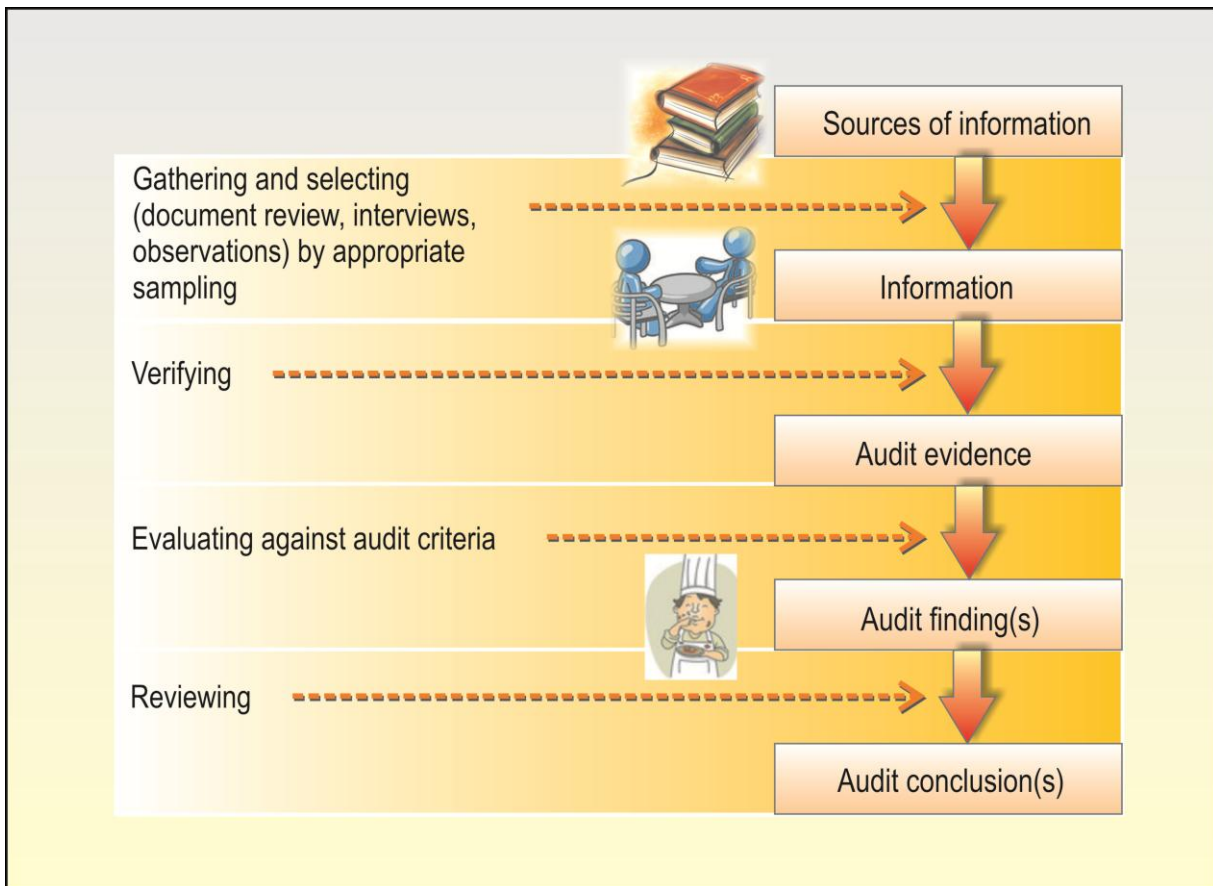


Figure 3.1: The conceptual basis of auditing
 (Hortensius & de Jong, 2002:23)

An audit should lead to impartial judgments: this can best be assured by an **independent** process. During an audit, the audit findings are **documented** and the audit is concluded by providing a report describing how the audit was carried out and on which evidence the audit conclusions are based - a transparent and traceable process.

During the audit relevant information is gathered and selected. Verifiable information is called **audit evidence** (records or statements) that is assessed against the **audit criteria**. Such assessments lead to **findings** of conformity or non-conformity. After consideration of all findings, an auditor can draw **conclusions** such as whether an organisation's management system does or does not conform to requirements of a management system standard (Hortensius & de Jong, 2002:23).

3.3 Objectives of an audit in the meat industry

In order to achieve the objectives of an audit, auditors collect evidence in three ways:

- through a **visual walkthrough** of the plant;
- by **interviewing** management and the employees on the floor; and
- through a **record review** to assess how consistent and effective the plant is in implementing its programmes (Gombas, 2005:1).

The objectives of an audit in the red meat industry are:

- To evaluate the degree of accuracy and uniformity of delivery of establishment and product inspection programmes on the basis of established criteria, and to identify non-conformance requiring corrective action
- To evaluate training needs and to discuss appropriate measures to correct deviations recorded
- To define industry and inspector concerns and problems which may impact on programme delivery for resolution by the appropriate programme officials (Canadian Food Inspection Agency, 2008)

To achieve the above objectives, the audits serve to determine:

- The accuracy of Acts, regulations, manuals and directives in relation to the current national version
- The conformance (interpretation and application) of establishment inspection, product inspection procedures with those described in appropriate procedures and inspection manuals
- The precision and the comprehensiveness of inspection reports and the completeness of all pertinent files
- The timeliness and thoroughness of the correction of deviations that were observed during an audit and of follow-up activities on auditors' findings
- Training needs for programme delivery (Canadian Food Inspection Agency, 2008)

The research objectives and operationalisation of the auditing (Phase 1 of the research) are listed in Table 3.1.

Table 3.1: Research objectives and operationalisation of audit processes - Phase 1

Research objective	Conceptualisation	Operationalisation	Data collection (Phase 1) Audit
To determine the need/role and advantages/disadvantages of traceability in the supply chain management process of 'Karoo lamb'	Traceability can be an important tool to help establish the authenticity of food and to check that claims made by producers are true (Van Risjswijk, <i>et al.</i> , 2008:453) Meat Safety Act (Act 121 of 1992) Abattoir Hygiene Act (Act 40 of 2000) SANS 19011 'Karoo lamb' is a regional product of South Africa and synonymous with quality, tradition and wholesomeness (Bramley, <i>et al.</i> , 2009:131) Traceability is the ability to trace the meat product to the final consumer and guarantees specific quality and safety (Opara & Mazaud, 2001:243)	Determine the need/role and advantages/disadvantages of traceability in the supply chain management process. Describe the main aspects of traceability and why retailers implemented it	Audit –through verification process and interviews
To investigate the current regulations and legislation in South Africa regarding traceability and traceability systems for red meat		Investigate the current regulations and legislation in South Africa in connection to traceability systems and its implementation	Audit – through verification process
To determine if retailers have implemented traceability systems for 'Karoo lamb'		Determine how and if retailers have implemented traceability systems	Audit – through verification process, interviews and observation
To investigate and describe the existing audit processes in place for traceability of products of origin with specific focus on 'Karoo lamb'		Investigate if audit processes are in place to ensure traceability. Describe the main aspects of the audit processes, how, when and by whom it is conducted	Audit – through verification process and observation

3.4 Traceability and auditing

The next section describes the need for and the role of auditing as well as the advantages and disadvantages it holds for traceability in the supply chain management process of red meat as stated in Objective 1 of Phase 1 of the research.

3.4.1 The role of auditing

Auditing is an important element of the Plan-Do-Check-Act cycle on which known management system standards are based. Audits are the basis for an organisation's self-assessment of its capability to continually comply with stakeholder requirements related to, inter alia, quality and environment concerns. Management systems provide the organisational means to ensure this capability and audits are required in the management system standards to assess the appropriate implementation and effectiveness of these systems (Hortensius & de Jong, 2002:20).

3.4.2 The need for auditing

A meat traceability system requires identification and record keeping (paper and/or electronic based, typically relying on barcodes and databases), that starts at birth and continues into the marketplace. Before meat reaches the consumer there are various risk factors that can, individually or collectively, devalue the product.

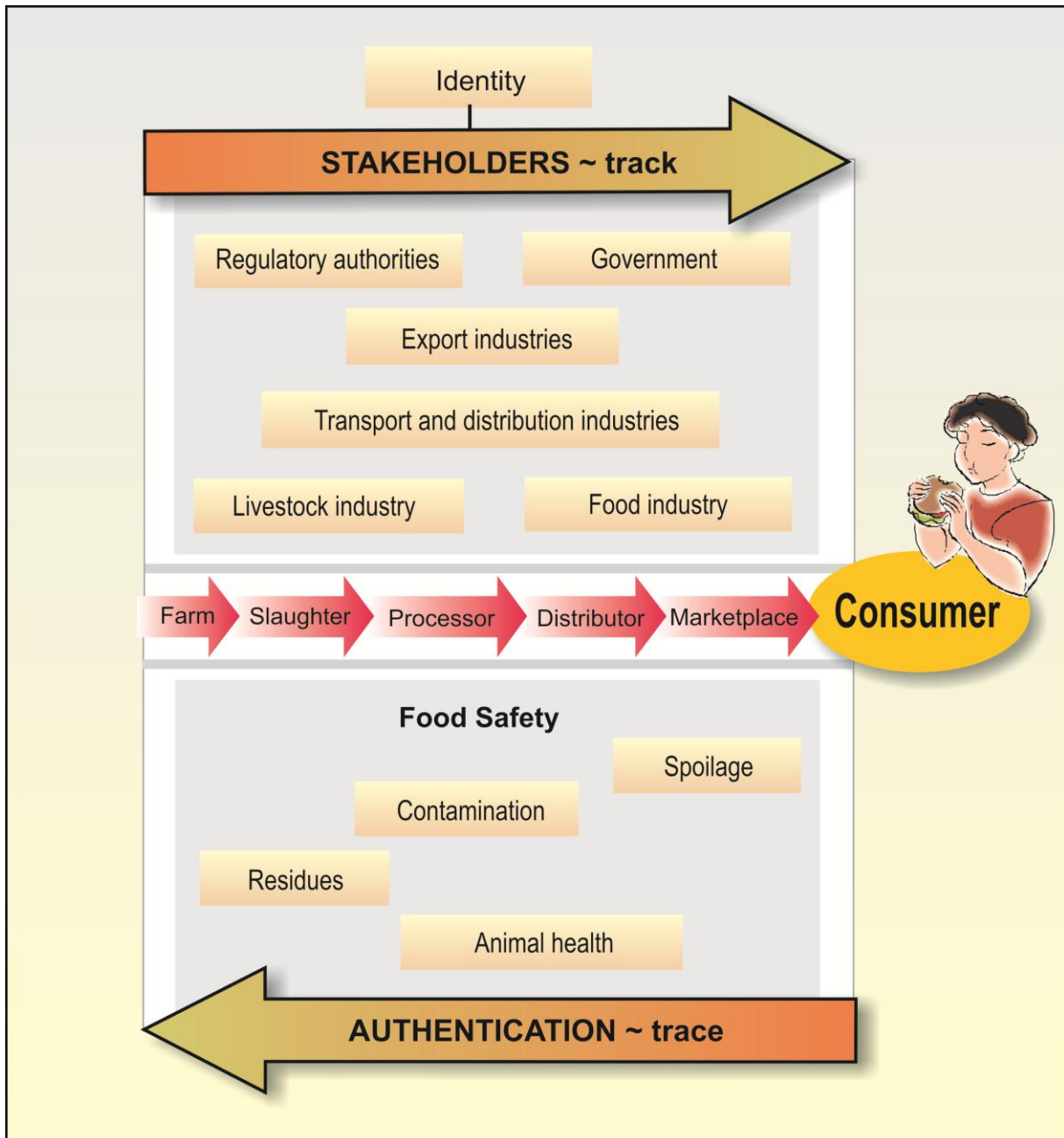


Figure 3.2: Schematic diagram of the gate to plate continuum of meat production
(Shackell, 2008:2135)

A diverse group of stakeholders, as illustrated in Figure 3.2, each have an interest at different stages of the pathway (Shackell, 2008:2135).

Traceability is by definition retrospective. Until the time that a 'trace' is required, the only action taken is in fact tracking. As the product moves forward in the production system, to be able to trace back to an incursion it is necessary to have tracked that product through each of the changes of custody that occur during production, processing and distribution as can be seen in Figure 3.2. Since there is no way to know in advance which samples and data may be involved in a traceability issue, where food safety has been breached or provenance is required, it is imperative that records are both complete and have integrity. A secure pathway is mandatory for irrefutable reporting of the outcome (Shackell, 2008:2135).

3.4.3 The advantages and disadvantages of auditing

While food safety and authenticity are by far the most important aspects of traceability in meat, there are other reasons for being able to trace what happens to a cut of meat for short periods during production and processing. Data collecting during processing can be analysed to determine business processes and attributes while providing compliance traceability by default. Traceability can therefore also be viewed as a way of adding value to an enterprise (Shackell, 2008:2140). Added value can range from authenticating the product through to improving the intrinsic attributes of the animals and/or the meat, to improving efficiencies of production and processing. Through quality auditing retailers can also verify their practices and improve the consistency of their products and services (Hepner, Wilcock & Aung, 2004:553). The errors, whether committed unknowingly or consciously, are exposed during the audit process, and could help to prevent their occurrence in the future.

A disadvantage of an audit could be its cost as far as auditing expenses are concerned, because the auditors must be paid. Guaranteeing that comprehensive records of all the interactions are preserved can also involve incurring a great deal of expense.

The next section describes the regulatory aspects of red meat, namely, current regulations and legislation, as related to the second objective of Phase 1 as listed in Table 3.1.

3.5 Regulatory aspects concerning red meat

The second objective of Phase 1 of the research as given in Table 3.1 was to investigate the current regulations and legislation regarding traceability and traceability systems for red meat. Traceability is basically a proactive approach to food safety and quality management as it requires pre-incident investment in the form of auditing.

3.5.1 Legislation in South Africa

Many regulations relating to the production, marketing and labelling of food are in place to protect the South African consumer. The most important law concerning red meat is the Meat Safety Act, 2000 (Act 40 of 2000) that addresses measures to promote the safety of meat and animal products and to establish and maintain national standards concerning abattoirs.

The abattoir industry is responsible for the conversion of livestock to meat. Meat inspection is compulsory at approved abattoirs, in terms of the Meat Safety Act no. 40 of 2000. It remains one of the most important components of food safety management. The independent agent at an abattoir ensures a safe and wholesome product to the consumer through compliance with the regulations of the Meat Safety Act and ante mortem, primary and secondary meat inspection at the abattoir.

The Veterinary Services section of the Department of Agriculture was responsible for meat inspection at approved abattoirs until 1994, except for abattoirs with exemption in terms of the Agricultural Product Standards Act, 1990 (Act 119 of 1990). The inspection service was deregulated in terms of the Abattoir Hygiene Act of 1992. The Abattoir Hygiene Act No 121 of 1992 provides for the maintenance of proper standards of hygiene in the slaughtering of animals and in the handling of meat and animal products.

Meat classification is a voluntary system in terms of the Agricultural Product Standards Act, 1990 (Act 119 of 1990) to provide for the classification and marking of meat. An abattoir may only classify meat if it has the services of a qualified and experienced person to render such a service. The classification of meat is governed by the regulations on the classification and marking of meat and although participation is voluntary, 95% of slaughtering done in abattoirs is classified. The standard of classification throughout the country is monitored by SAMIC.

The Animal Identification Act, 2002 (Act 6 of 2002) consolidates the law relating to the identification of animals and provides for incidental matters. It states that all owners of cattle, sheep, goats and pigs must register an identification mark at the office of the registrar of animal identification. Each owner must then mark their animals in the prescribed manner.

3.5.2 Legislation in Europe

Regulation (EC) no 178/2002 also known as the General Food Law, of the European Parliament and of the Council of 28 January 2002, constitutes the framework of European food law. These principles form a horizontal framework on which other food legislation in the European Union (EU) is based. For European authorities safety is the most important criterion for their food products and the European food industry addresses food safety issues at every stage of the food supply chain. The EU system is built on the concepts of traceability, transparency and assurance (TTA). Figure 3.3 provides an overview of the structure of EU food safety legislation.

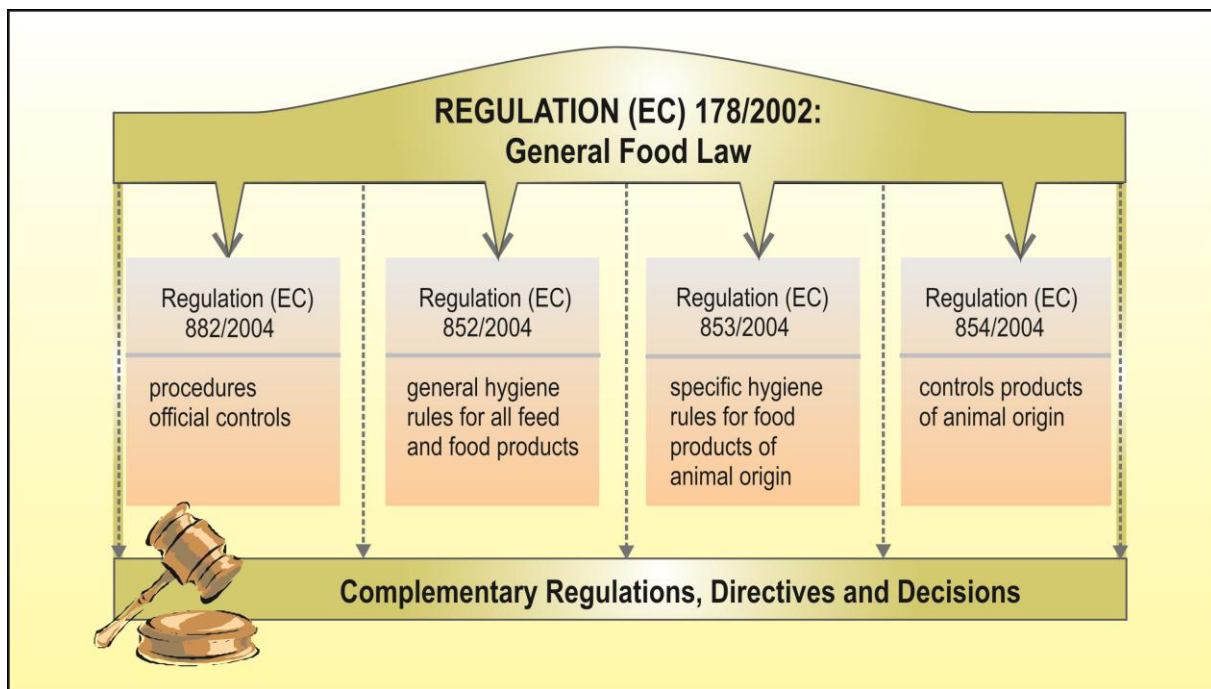


Figure 3.3: The structure of the EU food safety legislation
(EU Hygiene Package strengthens consumer protection, 2006)

Regarding the traceability of food products, it states the following in Article 18, Clause 181:

- The traceability of food, feed, food-producing animals and any other substances intended to be or expected to be, incorporated into a food or feed shall be established at all stages of production, processing and distribution.
- Food and feed business operators shall be able to identify any person from whom they have been supplied with a food, a feed, a food-producing animal, or any substance intended to be incorporated into a food or feed. Operators shall have in place systems and procedures which allow for this information to be made available to the competent authorities on demand.
- Food and feed business operators shall have in place systems and procedures to identify the other businesses to which their products have been supplied.
- Food or feed which is placed on the market or is likely to be placed on the market in the community shall be adequately labelled or identified to facilitate its traceability, through relevant documentation or information in accordance with the relevant requirements of more specific provisions.

The International Organisation for Standardisation (ISO) is a worldwide federation of national standards bodies that promotes the development of standardisation and international standards for a wide range of products. ISO standards applicable to traceability are now discussed.

3.5.3 International Organisation for Standardisation (ISO)

The International Organisation for Standardisation develops voluntary international standards for products and services. The benefit of ISO standards for consumers is the conformity of products to International Standards that provides assurance about their quality, safety and reliability.

3.5.3.1 A new South African Auditing Standard: SANS 19011

Standards South Africa (StanSa - formerly SABS Standards) provide standards that enhance the competitiveness of South Africa and are the basis for consumer protection, health, safety and environmental issues.

An international standard by ISO (ISO 19011) has been adopted as a South African national standard (SANS 19011). It is a joint standard for both quality and environmental management systems that can be summarised in three main points:

- Better applicability to the conduct of internal audits and also more focused on use by small and medium sized enterprises
- A more flexible approach to auditor competence, qualifications and audit team selection
- Applicability to combined audits, therefore bridging the gap between quality and environmental management system tools (Hortensius & de Jong, 2002:20)

Although the standard was designed specifically for quality and environmental system auditing, the guidance in SANS 19011 can easily be applied to other types of auditing such as process and product audits, regulatory compliance audits and other management system audits.

The next section investigates whether retailers have implemented traceability systems for red meat in order to provide information regarding products of origin as stated in Objective 3 of Phase 1 of the research.

3.6 Retailer implemented traceability systems

Traceability of meat and meat products is a major issue in the meat industry with the two main drivers being food safety in risk management and authentication. A two-part system has developed: live animal traceability, and meat traceability, within the food chain from the farm to the retailer. Linking these two systems at the stage of slaughter and processing is an ongoing challenge for the meat industry.

In preparation for this research, as a first step, towards the end of 2008 and at the beginning of 2009 semi-structured interviews were conducted with role-players in the red meat industry (SAMIC and technologists from different retailers) with the purpose of getting an overview of the stance taken with regard to the red meat industry, and the implementation of traceability in the supply chain, the so-called farm to fork continuum (Addendum C).

Interviews conducted

Interviewing is the predominant mode of data or information collection in qualitative research (De Vos, Strydom, Fouche & Delpont, 2003:292). For the purposes of this research, the semi-structured interview technique was used that involved the use of a structured set of questions asked in a systematic and consistent order, but further questions were also asked where

necessary to solicit further detail. The researcher thus has the freedom to probe beyond the answers given. The questions were pre-determined in terminology familiar to the people being interviewed. Interview questions were based on a review of the literature pertaining to quality practices, auditing and continual improvement in the food industry. The data were transcribed from hand-written notes of the interview sessions and information on actual practices was obtained. The interviews explored the auditing process regarding traceability by determining what is audited and why, by whom and how the results are used.

The semi-structured interviews were carefully analysed. According to SAMIC (2008) South Africa is divided into 11 regions and each region has its own regional manager, headed by a national manager. SAMIC as custodian, is contracted as an independent third party and is responsible for the auditing of the different role players in the red meat industry. Because the different retailers in South Africa selling lamb/mutton have different traceability processes in place, these retailers countrywide regard this information as highly confidential. Moreover, it was found that, during the period of 2009 to 2010 no retailer in South Africa sold lamb that was certified and labelled 'Karoo lamb'.

The major retailers have their own standards and guidelines regarding traceability, and these are audited by each retailer or their auditing company. In visiting the offices of SAMIC, at the beginning of 2009, information was obtained that gave an indication of the differences, regarding traceability. (Addendum D). It was discovered during the interviews that the different retailers use different indicators to distinguish their lamb from that of another retailer. The indicators or labelling on the packages varied and examples were *Free Range*, *Certified Natural Lamb*, *Just Lamb* and *Country Reared*. The free range lamb was said to have no added hormones, routine antibiotics or growth stimulants and the animal was allowed free movement.

If necessary lamb can be traced back, but only through batch traceability. This means that, through consulting the relevant documentation, the lamb can be traced back to the group of farmers where the lamb was on the specific day that it was delivered to the abattoir using its sell-by-date. The sell-by-date is then seen as the traceability code.

The next section investigates and describes the existing audit processes and procedures in place for traceability of red meat products as stated in Objective 4 of Phase 1 of the research.

3.7 Audit procedures and processes in place for traceability

3.7.1 Sampling procedure

Within the meat industry four different industry sectors play a role in the traceability chain: **farm, abattoir, processing plant** and **the retail industry**. Each of these four sectors had to be audited to establish whether the traceability chain stayed intact or not. These four sectors were therefore included in the sample for a variety of reasons. Conditions that applied were:

- Being able to **interview** representatives of companies from slaughter to finished product at the retail level in order to trace auditing activities throughout the supply chain.
- Having an opportunity to **observe** a range of audit applications as companies within the meat supply chain had different specifications.
- Securing consumer **feedback** in the form of complaints or expression of needs that would permeate all levels of the supply chain showing auditing as an integral part of the entire traceability process.

SAMIC assisted in identifying and locating the four industry sectors in Gauteng that were audited in the research. The researcher accompanied an independent, qualified auditor to the four different sites to observe, investigate and to participate in the auditing processes. The main reason for conducting the auditing sample in the Gauteng region was that the auditor of SAMIC was responsible for the auditing of the industry sectors in the Gauteng province of South Africa. The auditor arranged the times and dates for the audits with the farmer, the abattoir, the processing plant and the retailer that took place over a period of four months in 2008. Certain preparation steps were effected before the audits.

3.7.2 Audit preparation

The steps that were taken when preparing for the audit were:

- A lead auditor and team members were selected
- The area to be audited was selected
- A written audit plan covered the following:
 - Location (region), date and language of the audit
 - Members of the audit team
 - Who was to be audited

- Identifying the audit objectives and its scope
- Specified the standards against which the audit would be carried out
- Distribution of the audit report
- Development of the audit schedule

3.7.3 Audit execution and trustworthiness

During the execution of the audit the scope of the audit was limited to the standards and requirements of the type of audit. It was necessary to draw up a checklist that was used by the audit team. This checklist was the tool to be used as a guide and was designed so that it did not restrict additional activities or investigations considered necessary as a result of information gathered during the audit as suggested by the Canadian Food Inspection Agency (2008).

The following steps were involved in the audit:

- **Opening meeting.** The purpose was to set out the groundwork by identifying members, reviewing objectives, establishing communication and other linkages required for an effective audit.
- **Review documents, regional procedures and arrangements** relating to the meat programme activities that were audited and compare these with the national reference standards set out in the current version of the Meat Inspection Act & Regulations.
- **On-site verifications** to ensure that the specified standards were followed. Evidence was collected through the use of interviews, observation and document examination. Observations were recorded and reviewed with non-conformities being identified and supported by the appropriate evidence.
- **Closing meeting.** Audit findings were presented. All non-conformities and areas that needed improvement were reviewed and recommendations for improvements presented.

The use of checklists is a necessary tool for auditing. Two types of checklists exist, checklist governance and risk-oriented auditing. In checklist governance a formal checklist is used and auditors are able to prove that they have conducted their audits appropriately through ticking the boxes on the checklists. Risk-oriented auditing approaches focus more strongly on the personal responsibility of the auditor by allowing more leeway in the auditing process (Albersmeier, *et al.*, 2009:933). Table 3.2 summarises the concept and goal of the risk-oriented approach, compared to the checklist governance approach.

Table 3.2: Summary of overall concept and goals of risk-oriented auditing
(Albersmeier, *et al.*, 2009:933)

Overall concept	Checklist governance “Fair” audit	Risk-orientated auditing “Efficient and effective” audit
Goals	<ul style="list-style-type: none"> – Consistent audit/checklist – Stepwise refinement of the catalogues of refinement – Same expenditure and amount of time for every audit – Same audit intervals – Same training for all auditors – Only regular audits with announcements 	<ul style="list-style-type: none"> – Concentration on risk areas – Stepwise improvement of the efficiency and effectiveness of the audits – Reduction of time and expenditures by selective audits – Risk-oriented audit intervals – Training of the auditors for special risk areas – Randomly chosen audits without announcements plus additional risk-oriented sampling audits

3.7.4 Following the traceability pathway from farm to retailer

Traceability has to cover all steps of production from “farm to fork” and has to be built as a continual chain to be effective and to create value. Every stage needs to be monitored to ensure the maximum degree of traceability and can only be successful if the whole process is transparent. Table 3.3 shows typical audit data relevant to traceability.

Table 3.3: Audit data relevant to traceability

Information relevant to traceability	
a) Who	Company/Branch/Department Responsible person
b) When	Date/Time Shift
c) What	Product item(s)/Logistic item/Quality factors
d) Where	Location(s) Company/Area/Container(s) used for storage Location(s) of the origin of the materials (input) Location(s) to which they are forwarded (output) Other relevant locations (storage site, packhouse, production line, coldroom etc.)
e) How	Temperature Handling/Treatments Special requirements/warnings
f) How much	Total number/Total mass Batch/Run

The observations that were made by the researcher when attending the four audits, to establish whether and to what extent traceability processes are in place for lamb/red meat in South Africa,

were used as verification for the information received from a personal visit by the researcher to SAMIC in 2008 (See Addendum D).

3.7.5 Farm audit

The farm audit took place on 3 September 2009 in the Vereeniging district of Gauteng, South Africa and the researcher participated in the audit to observe how traceability of animals is achieved in practice. The audit was done as per requirement of Retailer C, that sells country-reared beef, lamb, pork and chicken. The main purpose of the audit was to determine if the specifications, as set out by the retailer, were met.

The following was established during the auditing of the farm:

- A map and management plan was drawn up by the farmer
- The animals were identified by a numbered ear tag and all were recorded
- The records were kept up-to-date and accessible for audit
- The animals were marked with three holes in the left ear (specific markings of farmer)
- Ear marker in the middle so that tag cannot be pulled out easily
- A spreadsheet was used to capture the data about the animals with their ear markings
- All animals were documented on the farm
- Re environmental standards: the water and ground conditions were tested by an independent third party and found to be in a good condition
- The animal's diet was not supplemented by animal by-products or waste. No herbicides or hormones were used.
- Animals were kept in different pens according to their age, to prepare the animals for slaughtering at the abattoir
- Animals were first allowed to graze freely until they reached a certain weight and were then moved into the pens
- In the pens the feed and water were separated to keep it clean and free of contamination
- The feed were kept dry at all times to prevent fungi growing and to keep contamination at bay
- Organic farming methods were used to keep pests at bay

No problems or concerns were found during the audit. The producer/farmer met all the standards and requirements set by the retailer and had fully complied with the requirements for an effective traceability system in the meat industry that state:

- Each animal/product must be clearly marked
- A record must be kept of the batch ID and the destination details
- Records of operations critical to food safety and quality must be maintained (Yordanov & Angelova, 2006:3)

The second link in the traceability chain of red meat is the abattoir that was audited next.

3.7.6 Abattoir audit

An abattoir serves as an instrument to transform a live animal into meat that can be taken home in an acceptable form. To accomplish this, the animal goes through a process to be transformed into a carcass. The abattoir is the second element of the traceability chain and animals from the farm that was audited in September 2009 were being slaughtered during the abattoir audit.

The abattoir audit that the researcher attended took place on 13 November 2009 in the Springs district of Gauteng, South Africa. The researcher accompanied the auditor and observed the auditing process. Regarding traceability standards, a third-party audit assured that some objective standards had been reached or maintained. The official report was used to record the conformance and uniformity of the programme delivery, according to the specified standards. The audit evidence was verifiable.

The audit report contained the following information:

- The scope and objectives of the audit
- Details of the audit plan including team members, auditee representatives, date and location
- Reference documents against which the audit was conducted
- Audit findings (observation of non-conformity and areas that needed improvement) and the corrective action requests
- The distribution of the audit report

Data collection consisted mainly of answering questions from the checklist. Through a visual walk-through of the abattoir observations were made and later analysed to determine the findings. The evidence gathered was based on observation, measurement and testing so that all evidence could be verified to support the conclusions drawn.

The following was established during the abattoir audit:

- Before slaughtering, an inside and outside inspection of the premises was done to ensure that regulations were followed and standards met. The general condition and cleanliness of the facility and equipment were observed and listed.
- Personnel practices were observed and listed.
- The animal pens outside were inspected to ensure their cleanliness. Circular pens with rubber sides are the ideal because that prevents injuries.
- The animals were unloaded from the truck and were kept calm till they were killed.
- The animals were prevented from suffering because they were killed instantly.
- It took less than 5.3 seconds from killing the animal till its throat was being cut and the bleeding process started.
- The animals were still ear- tagged.
- As only one farmer's animals were being slaughtered at a time, it was easier to keep the traceability process intact.
- The slaughtering process took approximately one hour before the carcass was put in the cold storage chamber.
- The country-reared animals were slaughtered for a specific retailer – the tails were kept attached to the carcass for easy identification and traceability.
- When the animals' heads were removed from the body, the ear tags were removed and the details written down for documentation purposes and to keep the traceability records intact.
- After the carcasses were cleaned they were roller marked according to the grade and class
- The carcasses were also bar-coded with a sticker stating the name of the abattoir

The original animal identification markings and the abattoir identification should be linked to maintain a traceability chain. During the audit execution this linking chain was found to be in order. The biggest problem that was encountered concerned hygiene: no washing of hands and a lack of knife sterilization. During the record review it was found that the traceability documentation was not properly completed and recorded and could lead to a breach in the integrity of the traceability chain. In Figure 3.4 the steps that turn a live animal into a piece of meat that consumers can purchase at a retailer are illustrated.

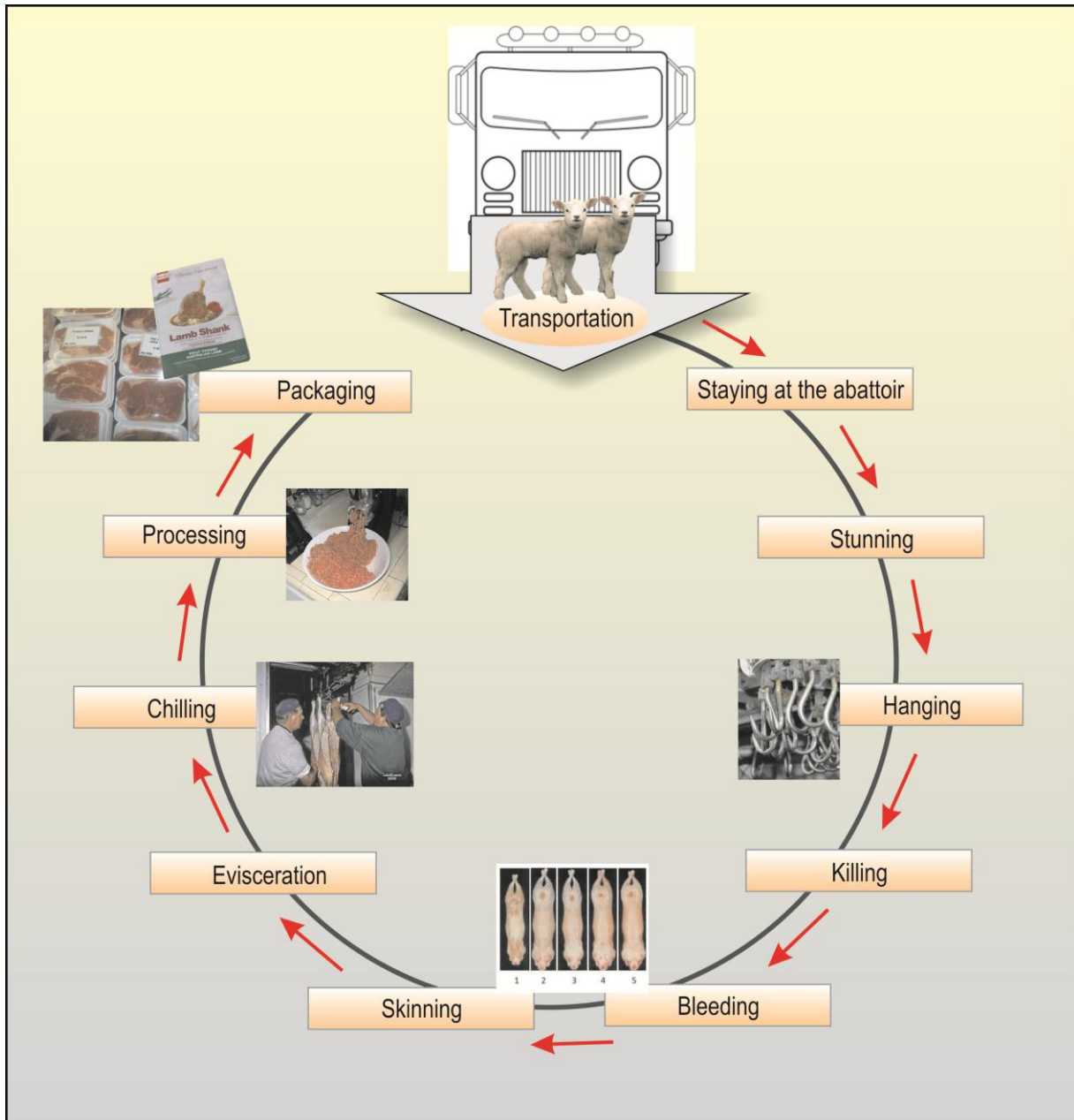


Figure 3.4: Preslaughter, slaughter and processing steps of sheep

The next step was the observation of and participation in the auditing process of the processing plant.

3.7.7 Processing/deboning plant audit

The following observations were made by the researcher during the audit of a processing plant located at Kaya Sands, Gauteng, South Africa, on 12 August 2009. With the help of a checklist

the auditor had evaluated the facilities and systems to ensure compliance with the requirements. The checklist identified the relevant procedures, documents and other information to be audited. Data collection consisted of answering questions from the audit checklist. The checklist also served as a document to record audit observations so that during analysis the auditor had a good record from which to reach the correct audit conclusions.

The following was observed and recorded by the researcher:

- The audit was conducted according to the specifications of SABS 19011.
- The processing plant was informed beforehand of the audit.
- To ensure that the audit was conducted in a timely and objective fashion it was necessary to know the relevant regulations, audit background and HACCP status of the plant and the product specifications (all the requirements concerning the product as specified by the retailer).
- In the opening meeting the audit plan and steps were explained.
- A register was kept of all the persons who attended the opening and closing meetings.
- The audit was seen as a sampling process and the auditor only recorded her observations of what happened during the time the audit took place.
- The audit is done annually. If the plant failed the audit, another audit would be done after corrective steps had been taken.
- The carcasses that were received at the processing plant had barcodes stating from which abattoir they originated. The individual barcodes had to correspond with the delivery note of the abattoir with information stating when the animal was slaughtered and loaded on the truck for transporting.
- Every carcass was roller marked to state the grade, class and type of meat.
- Different types of carcasses were received at the deboning plant on the day of the audit.
- A major concern was that the hung carcasses were not separated into the different types of meat for instance ‘country reared’. The carcasses should have been kept together.
- In the cooler room there are specific storage places for the different types of meat. The area was however, problematic as the crates were not marked and there was a definite possibility that the cuts of meat inside the crates could get mixed up, putting the traceability of the meat in jeopardy.
- It was impossible to identify the roller mark on the cuts of meat inside the crates. Again that jeopardised the traceability of the meat.

- During the audit it was noted that the temperature inside the cooler was not at the correct temperature.
- After the cuts of meat were packaged the packaged date formed part of the traceability trail.
- The auditor conducted a record review to assess how consistently and effectively the processing plant was implementing its programmes. Documentation concerning the delivery of the carcasses from the abattoir must be kept on file as the most important factor is the integrity of the data.
- The sell-by-date on the packaged meat gave an indication of the group of carcasses that were slaughtered on the same day that was part of the traceability trail.
- A closing meeting was held after the auditor had collected all the necessary information through the different methods of data collection. The auditor explained the positive and negative aspects of the findings.

Critical points for traceability during processing depend on the type of technology. Particular attention must be paid when carcasses are temporarily removed from the processing line. After chilling, each carcass or at least each box in which carcasses are placed must be labelled with the traceability code. Apart from the utilisation of the carcasses (further chilling, refrigeration storage, packaging, portioning or deboning) well-identified blocks containing carcasses belonging to the same production unit should be formed. The carcasses sold as whole must be packaged and the labelling must contain all the necessary information such as the traceability code. The traceability code may be formed from production line numbers, time of production etc, in any combination. This may additionally be encoded within a bar code. Major difficulties arise when carcasses are portioned into parts prior to retail packaging. When working with large quantities of meat at the same time, it was suggested that group separation by physical separation and manual records be maintained.

It was found that the weakest link in the meat supply chain in terms of traceability was the processing plant as the carcasses were portioned into lots of parts prior to retail packaging. Even if all the components of a carcass can be kept together during slaughter and processing, a verifiable audit trail is more difficult to maintain once the meat is placed with a distributor. At the distribution point primal cuts may be further reduced prior to distribution.

In a large or very large processing and packing plant identification of primal/subprimal cuts from a specific animal is very difficult. In very small volume plants post-slaughter traceability can be

accomplished by processing single carcasses one at a time. In medium volume plants traceability can be accomplished by tagging carcasses, sides, quarters and primal/subprimal cuts plus complete separation/segregation of the trimmings of the carcass (Smith, Pendell, Tatum, Belk & Sofos, 2008:73).

Next the process of auditing a retailer is described.

3.7.8 Retailer audit

A traceability system helps a retail company withdraw or recall products faster and more efficiently. Therefore all relevant records for traceability purposes should be kept. It is necessary that all products are properly identified throughout product realisation and delivery phases to enable traceability, should a recall become necessary. Lamb and lamb products are traceable back to source-origin using inventory and daily product utilisation records.

For a retail company, a set of prepared guidelines (Table 2.5) is useful in implementing a functional traceability system. During the retail audit the researcher found evidence of the process and observed the following:

- Each retailer had their own specifications and standards and the audit was conducted according to the specific retailer’s specifications and standards.
- The temperature of the meat and the fridges were measured.
- The colour of the meat was checked to establish if it was red.
- The signage inside the store was seen to be correct.
- The matching of the label and the product was verified.
- The labels needed to be legible and placed in a conspicuous location so that the reader would be able to read and understand them under normal conditions of purchase.
- The roller mark had to be visible on the meat as it is part of the traceability process.
- The date on the label had to be accurate as it was used as an important traceability tool.
- The delivery notes were filed and all records concerning transactions were stored.
- The name, address and phone number of the supplier and the nature of the products being supplied was available.
- The retailer would be able to verify the accuracy of the product labelling as the unique identifier or lot number was indicated on the product.
- All meat packages were correctly labelled and the brand name was clearly visible.

- A closing meeting was held where all questions concerning the audit findings were answered.
- Had non-compliance findings been identified the store representative would have been provided with the completed checklist and summarised findings for attention.

Once packaged for sale, most food products are labelled with a product code, generally in the form of a barcode. This labelling at the retail level is used to convey traceability information to consumers, whilst mechanisms such as certification, contracts and third party audits are used to convey traceability information along the supply chain.

3.8 Conclusion

While key issues of traceability are reasonably straightforward, it is the implementation that is complicated, primarily due to the number of levels within the supply chain and the numbers of producers supplying the chain. To ensure that traceability stays intact from the time an animal is born until the meat from the animal reaches the consumer, the entire supply chain must be audited. Third party audits done by SAMIC provide consumers with assurances that safety management systems, including traceability systems have met some objective standards for quality.

Auditing can be an effective tool but it depends on the competent use of the audit results as it is a major part of the success of any audit. The audit evidence must be evaluated objectively to determine the extent to which the audit criteria are fulfilled. External or third party audits can add greater value because of their objectivity and the fresh perspective that external auditors bring to their task. The feedback from audits can be used for long-term planning to improve the system, rather than simply as opportunities for short-term corrective action. The recording procedure in a traceability system must cover the entire supply chain and this entails identifying, capturing and retaining information in a readily accessible and retrievable form at each step in the supply chain, as the major objective is to enforce the provision of clear and reliable information to consumers at points of sale.

3.9 Summary

In the first part of the chapter discussion focused on the need and the role of audit processes and their advantages and disadvantages regarding traceability in the supply chain management

process of red meat. A meat traceability system requires identification and keeping records that start at the birth of an animal and continue till the retailer sells the product. Through auditing, the risk factors can be identified and addressed so that the origin of the product can stay intact.

The second part of the chapter dealt with the regulatory aspects of red meat in South Africa. The discussion was based on current legislation and ISO (International Organization for Standardization) standards applicable to traceability for food. ISO 19011 has been adopted as a South African national standard (SANS 19011) for quality and environmental management. SANS 19011 can also be applied to product audits.

The third part of the chapter investigated whether retailers did implement traceability systems for lamb, in order to provide information about a product's origin. In the latter part of the chapter the existing audit processes and procedures in place for traceability of red meat products, with a specific focus on 'Karoo lamb', were addressed. Information gathered consisted mainly of collecting the answered questions from an audit checklist. A discussion of the observations of the researcher when attending the farm, abattoir, processing plant and retailer audit followed.

The next chapter deals with the methodology used in the research for Phases 2 and 3.

CHAPTER 4

RESEARCH METHODOLOGY (PHASE 2 AND 3)

4.1 Introduction

The research design is mainly determined by its purpose and research objectives. Chapter three describes the research approach, operationalisation as well as the relevant data collection procedures that were used to generate the research data.

4.2 Research approach

To be able to reach the research goal, a mixed methodology of quantitative and qualitative techniques were employed. Both qualitative and quantitative research approaches involve systematic methods to gather high-quality data, but in each approach the measurement process is different (Neuman, 2000:156). A descriptive exploratory study in the quantitative and qualitative research paradigms was planned for the research based on the significance of the influence and role of traceability in the consumer decision-making process towards the purchase and consumption of 'Karoo lamb'. The objectives of exploration may be accomplished using different techniques when both quantitative and qualitative methods are used (Cooper & Schindler, 2011:143). Descriptive and exploratory research have many similarities and blur together in practice (Babbie, 2010:92).

An exploratory research approach was selected as it is often adopted when a researcher examines a new interest or when the subject of the study itself is relatively new (Churchill & Iacobucci, 2002:91; Babbie & Mouton, 2001:79). Such a design is valuable when a researcher is breaking new ground as it facilitates obtaining at least approximate answers to some questions on a relatively new subject. It addresses the "what" question and is difficult to conduct because there are few guidelines to follow (Neuman, 1997:19). In the research the researcher wanted to know more about 'Karoo lamb' and its perceived attributes, as well as the role and influence it has in the decision-making process regarding the purchase of 'Karoo lamb'.

A descriptive study tends to focus on behaviour, inclination, situations and events and relies on observation as a means of collecting data. Observation can take many forms and, depending on the type of information sought, people can, for instance, be interviewed or distributed

questionnaires that are appropriately structured can be analysed (Walliman, 2005:116). The outcome of a descriptive study is a detailed picture of the topic under investigation. This research is descriptive as it aims to describe the product attributes that influence the purchasing decision of consumers regarding 'Karoo lamb'.

4.3 Operationalisation

Operationalisation indicates the way in which the concepts in the conceptual framework will be defined and suitably measured. The process of operationalisation therefore involves compiling a list of real characteristics denoted by the concept for the purpose of measurement (De Vos, *et al.*, 2003:193). The identified concepts are indicated in the conceptual framework and were measured in three phases as described in Tables 3.1 and 4.1. Conjoint analysis was the method used for gaining a better understanding of the real value consumers attach to certain attributes when making purchasing decisions in a retail situation as suggested by North & De Vos (2002:33). The preferences consumers have for certain products may depend on the joint influence of product attributes, such as quality, safety and price. Thus, the combined effect of several product attributes on the final decision to purchase a specific product should be considered when researching consumer purchase decisions.

Table 4.1: Summary of conceptualisation and operationalisation – Phase 2 & 3

Research objectives	Conceptualisation	Operationalisation	Data collection (Phase 2) Focus group
<p>To determine and describe the product attributes that influence the decision-making process of consumers regarding 'Karoo lamb'</p>	<p>Decision making process signifies goal-striving behaviour (Brijball, 2003:93) and refers to the different stages in consumer decision making which may result in purchasing of Karoo lamb</p> <p>Product attributes refers to the features of a product that meet consumer's needs. Can distinguish between extrinsic and intrinsic attributes of a product (Nortchen, 2000:231)</p> <p>Extrinsic attributes:</p> <p>Labelling refers to the claims, illustrations, symbols and logos that convey information on what a consumer can expect of the product from the package (De Villiers, 2008:111)</p> <p>Origin refers to an agricultural product's specific geographic origin that differentiates it from another product through the particular locale as a regional product (Kuznesof, <i>et al.</i>, 1997:199)</p> <p>Brand refers to the whole experience surrounding a product. (Hawkins, <i>et al.</i>, 2007:350). The brand of a product is recognised by the logo on the packaging and refers to the image and status the consumers' associates with the brand</p> <p>Price refers to the cost of the lamb available in the South African food sector and the amount of money the consumer has to pay for it</p> <p>Place of purchase refers to various outlets such as different retailers and butcheries that sells lamb</p> <p>Intrinsic attributes:</p> <p>Traceability is the ability to trace the meat product to the final consumer and guarantees specific quality and safety (Opara & Mazaud, 2001:243)</p> <p>Quality is an intangible characteristic of a food product and relates to its nutritional, microbiological and physiological characteristics (Issanchou, 1996:S7)</p> <p>Safety refers to an assurance that food will not cause harm to the consumer when prepared or eaten according to its intended use (Behrens, Barcellos, Frewer, Nunes, Franco, Destro & Landgraf, 2010:963)</p> <p>Animal welfare refers to the healthy keeping of animals, free of suffering and includes no added hormones, antibiotics or a feedlot environment (Appleby, 2005:2).</p> <p>'Karoo lamb' is a regional product of South Africa and synonymous with quality, tradition and wholesomeness (Bramley, <i>et al.</i>, 2009:131)</p>	<p>See probes on the different product attributes origin, brands, animal welfare, price, purchasing place, traceability, quality, safety and labelling (Addendum A)</p> <p>Transcription and analysis of focus group discussions (Addendum B)</p>	<p>Focus group discussion probed on:</p> <ul style="list-style-type: none"> - the influence of the origin of lamb during purchasing - brand name and preferred brand of lamb - the influence of animal welfare of lamb during purchasing - price of lamb - where lamb is purchased - influence of traceability of lamb during purchasing - quality attributes of lamb during purchasing - the safety attributes of lamb during purchasing - the influence of labelling

Research objectives	Conceptualisation	Operationalisation	Data collection (Phase 3) Conjoint Analysis
To determine and describe the different levels of importance of the product attributes that influences the purchasing decision of consumers regarding 'Karoo lamb'	<p>Attribute levels refer to the individual levels within each product attribute (Hair, Black, Babin, Anderson & Tatham, 2006a:463)</p> <p>Purchasing decision refers to the outcome of the consumer's evaluation of a set of alternatives (Lindquist & Sirgy, 2006:42)</p>	See questions and ranking of attributes. (Questions 1-37 - Section A). Analysis of results in terms of importance of attributes.	Electronic conjoint questionnaire
To determine the contribution of traceability in labelling/branding of 'Karoo lamb'	<p>Traceability is the ability to trace the meat product to the final consumer and guarantees specific quality and safety (Opara & Mazaud, 2001:243)</p> <p>Labelling refers to the claims, illustrations, symbols and logos that convey information on what a consumer can expect of the product from the package (De Villiers, 2008:111)</p> <p>Brand refers to the whole experience surrounding a product. (Hawkins, <i>et al.</i>, 2007:350). The brand of a product is recognised by the logo on the packaging and refers to the image and status the consumers' associates with the brand</p>	Analysis of results in terms of need to certify Karoo lamb	Electronic conjoint questionnaire
To determine the need of establishing a Geographical Indication for the regional product 'Karoo lamb' in South Africa	Geographical Indications (GI's) refer to the quality, reputation or other characteristic of the product that is essentially attributable to its geographical origin (Bramley, <i>et al.</i> , 2009:109)	Analysis and interpretation of results in terms of consumers valuation of need and importance of traceability	Electronic conjoint questionnaire

4.4 Data collection

Data collection techniques, as described by Neuman (1997:30), may be grouped into two categories: quantitative (or numerical), collecting data in the form of numbers and qualitative (or categorical), collecting data in the form of words and pictures.

4.4.1 Data collection phases

The data for the research was collected through a multi-method approach to address the research questions. The research process involved a quantitative approach that also implemented qualitative techniques such as focus groups (a method to obtain data) and conjoint analysis (a data analysis method and specialist data collection method).

Data was collected in three phases for the purpose of triangulation and to enhance the authenticity of the data. The study used a sequential form of data collection in which one type of data is collected and analysed prior to a second data collection. In sequential data collection the data is thus collected in stages - the quantitative and qualitative data collections are related to each other and not independent. The researcher used the results from the first phase and built on it in the second phase:

- **Phase 1** - the audit processes implemented by the different retailers in South Africa regarding traceability of lamb meat were investigated and described (quantitative technique).
- **Phase 2** - focus group discussions (qualitative technique) to establish the attributes of Karoo lamb to be used in the conjoint analysis.
- **Phase 3** - conjoint analyses (a structured questionnaire) was used (quantitative technique).

(Phase 1 – the audit processes were discussed and the findings presented in Chapter 3).

4.5 Phase 2: An overview of the focus group discussions

Focus groups are group interviews designed for small groups of unrelated individuals and are a means of better understanding how people feel or think about an issue, product or service (De Vos, *et al.*, 2003:305).

4.5.1 Focus group definition

Focus group discussions can be defined as carefully planned discussions designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment (Kuznesof, *et al.*, 1997:200). It is a special kind of interview that is very useful in exploratory research (Neuman, 1997:253; Bless & Higson-Smith, 1995:113) and is a technique involving the use of in-depth group interviews in which participants are selected because they are a purposive, although not necessary representative, sample of a specific population. The group focuses on a given topic (Rabiee, 2004:655).

4.5.2 Focus group description and purpose

Focus groups consist of small groups, usually of six to twelve pre-screened participants who are relevant to the specific target market or objectives being researched. The participants are selected on the criteria that they would contribute something on the topic, are within the age-range, have similar socio-characteristics and would be comfortable talking to the interviewer and each other (Rabiee, 2004:655). Focus group discussions provide group members with a form of security that reduces the feeling of identifiability, which is a common problem in an individual interview (Babbie, 2010:323). Participants in a focus group are often more willing to volunteer information than during a personal interview because they feel less inhibited to share their experiences and in so doing encourage others to expose their ideas.

Focus groups are ideal to evoke spontaneous discussion that will illuminate a limited number of issues that might need some clarification (Babbie, 2010:323). The purpose of focus groups is not to make generalisations about the population but to obtain broader insights on, and better understanding of, how people perceive a specific concern. As for the validity of focus group results, focus groups are valid if they are used carefully for a problem that is suitable for focus group inquiry (Rueda-Baclig & Florencio, 2003:459).

4.5.3 Motivation for using focus groups

One of the distinct features of focus group interviews is its group dynamics; hence the type and range of data generated through the social interaction of the group are often deeper and richer than those obtained from one-to-one interviews (Rabiee, 2004:166). Focus groups are

especially helpful when understanding nuances of attitudes, beliefs or opinions as a major objective. Focus groups can provide information about a range of ideas and feelings that individuals have about certain issues, as well as illuminating the differences in perspectives between groups of individuals. Focus groups can generate large amounts of data in a relatively short time span and the findings may be used to precede quantitative procedures (Rabiee, 2004:166).

The use of focus groups was considered the most appropriate for some of the objectives of this study. While a thorough literature review was used to provide a theoretical framework for the study, the focus group discussions allowed for inclusion of additional information that might not have been taken into consideration. The purpose of the focus groups was to determine the contribution of product attributes that influence the purchasing decision of consumers regarding Karoo lamb.

4.5.4 Sampling procedure

In the qualitative research paradigm where the objective is to obtain specific in-depth information, a smaller well-chosen sample is used (Neuman, 2000:198, Babbie & Mouton, 2001:288). Each focus group comprised a maximum of ten participants, sufficient to accommodate diversity of perceptions without being unwieldy. It provided enough breathing space for each participant to express personal views without stretching the length of the session (Babbie, & Mouton, 2001:291). Participants for the three focus groups were selected by means of a convenient selection but according to pre-determined criteria. The intention was to recruit a heterogeneous sample of lamb/mutton purchasing consumers that included males and females from different income groups, age and living standard measures (LSM) categories and various socio-cultural backgrounds.

The focus group sessions were organised and conducted following accepted guidelines regarding size, composition and procedures. In Table 4.2 the criteria and the justification for these criteria for the focus group participation are provided. This was purposefully done to obtain specific required information from the group. By ensuring that only participants who were eager and willing to participate were included, it was assumed that their responses would be truthful. Simultaneous participation of friends, spouses and family were not allowed as more

honest and spontaneous expression of views and a wider range of expressions would then be obtained (Babbie & Mouton, 2001:292).

Table 4.2: Participant criteria and justification for focus group discussions

Criteria	Justification
Participants from the LSM groups 7-10	LSM groups 7-10 purchase and consume a higher percentage of lamb/mutton
Adults from the age of 18 upward	No specific age group is targeted
Participants must be literate	Participants must be able to express their views about the attributes that influence their purchasing decision of lamb/mutton
Participants must be familiar with lamb/mutton	The participants must purchase and consume lamb/mutton
Participants must have access to purchasing lamb/mutton at a retailer or butchery	Lamb/mutton must be available to the participants to enable them to provide information about the attributes that influence their decision making behaviour

4.5.5 Increasing validity during focus groups discussions

The participants who formed part of the focus group sample were not selected for the discussion session because the researcher knew them well and had a person relationship with them that could have led to bias thus affecting the accuracy of the results. The researcher took care not to prompt or provide answers during the data collection process. In addition, the focus group sessions were arranged to suit the participants with regard to time and location. In doing so, errors were reduced as the participants were not time pressured.

Focus group sessions were held in a neutral environment to enhance open communication between participants. Great care was also taken to see that the more passive participants were not unduly influenced or inhibited by the more vociferous participants. Lest the expressed opinions of the more active participants were voiced, every participant was given a chance to communicate their views. The moderator used group dynamics principles to guide the group in an exchange of ideas, feelings and experiences that involved 'Karoo lamb', the main topic of the research.

During the focus group session the moderator ensured that the following communication skills were employed:

- making eye contact, allowing for introductions and creating a warm, supportive and comfortable environment

- listening actively, focusing on what was being said and using the respondents' comments to paraphrase and to summarise
- remaining neutral yet involved and maintaining objectivity both verbally and non-verbally
- staying flexible by adapting to the flow of the discussion, and adjusting to the participants' requests during the focus group session
- using pauses and probing techniques – asking clear questions and pausing for responses, probing for more information, clarifying comments and avoiding asking why
- acknowledging each participant throughout the group meeting and respecting the various points of view
- practising good organisation and management skills by keeping the discussion moving and focused, and keeping within the prescribed time frame
- researching the topic (food traceability and 'Karoo lamb') beforehand which helped when probing issues and to encourage more in-depth discussion
- paying attention to participants and recognising group dynamics
- trying to maintain a human connection and keep the participants relaxed

4.5.6 Focus group venue

For the research separate focus group sessions were held at an office and a private home that provided a relaxed, informal and non-threatening environment which was conducive to group interaction. With a comfortable seating arrangement, proper eye contact between the participants, unrestrained interaction were ensured. It was an important consideration as the group members shared their ideas and responded to those of others. In the process, they influenced and were influenced by their co-participants.

4.5.7 Focus group procedure

Three group sessions were scheduled and facilitated according to the availability and willingness of the participants. The venues, an office and a private home, were convenient, easy to reach and had sufficient space and privacy. The setting of both venues was very quiet and private. During the sessions the moderator and the participants were placed in such a way that they faced each other, with sufficient open space in-between.

All three group sessions followed the same pattern:

- providing a name tag
- welcome and self-introduction
- explanation of the study and ground rules
- discussion time
- summarising of the discussion and
- an expression of appreciation

The duration of each session was approximately 1-1½ hours and the amount of time spent on a question varied from item to item and group to group. The moderator encouraged the free sharing of ideas without giving any verbal or non-verbal signs of approval or disapproval of the responses given. It was sometimes necessary to rephrase a response and to ask follow-up questions for purposes of verification or clarification. Before closure participants were encouraged to make additional contributions.

The sessions were conducted in English because the participants were comfortable about contributing in the language and were audio-taped with the knowledge and consent of the participants. Notes were also made during the discussion by a trained assistant, a fellow researcher.

All the recordings were transcribed verbatim – it included all the probing questions used by the moderator. Even the dialects and use of slang expressions as well as pauses were recorded as they responded to the moderator and to each other. The transcriptions of the interviews were made a day after each focus group meeting. The audio tapes for each session were carefully and separately marked. The transcription documents are provided in the addendum.

4.5.8 Focus group themes

The author wanted to ensure that the information provided by the focus groups would assist in determining the attributes of 'Karoo lamb' for the structuring of the conjoint analysis. Themes explored during the focus group discussions included:

- The concept of the 'Karoo'
- Authenticity of red meat
- The concept of traceability
- Lamb as meat product of origin

- The product attributes that influence the purchasing of lamb

4.5.9 Content analysis

Qualitative research and in particular focus group interviews generate large amounts of data (Rabiee, 2004:655). Qualitative content analysis is a detailed and systematic examination of the contents of a particular body of material and involves a process designed to condense raw data into categories or themes based on valid inference and interpretation (Leedy & Ormrod, 2010:144). This process uses inductive reasoning by which themes and categories emerge from the data through the researcher's careful examination and constant comparison (Stemler, 2001:1).

The process of qualitative content analysis often begins during the early stages of data collection and by going back to the intention of the study (Leedy & Ormrod, 2010:144). Following this concept is extremely helpful for managing the data, making sense of what is going on and getting rid of extra and irrelevant information. The content refers to words, meanings, symbols, ideas, themes or any message that can be communicated. The text is anything written, visual or spoken that serves as a medium for communication (Neuman, 1997:272). The purpose of content analysis is to provide knowledge, new insights, a representation of facts and a practical guide to action. It is a way of asking a fixed set of questions about data in such a way as to produce countable results (Marshall & Rossman, 1989:98).

To support valid and reliable inferences, qualitative content analysis involves a set of systematic and transparent procedures for processing data:

- The **first step** involves the frequency with which an idea was voiced, which can indicate an index of importance or emphasis.
- The **second step** involves the degree of positive or negative statements about an idea.
- The **third step** is the kind of qualifications and associations made that can suggest the intensity of belief.

The researcher personally transcribed the recordings of the three focus group discussions after every session. The transcribed data were compiled in such a format that the results could be divided into various categories. The topics discussed in the focus group discussions served as a guide to structure the analysis of the topics by dividing the data into smaller and more

meaningful units. The researcher then used comparisons to refine categories and to discover patterns, themes, similarities and differences. The frequency and extensiveness of the participants' comments were considered as very important and attention was given to opinions that were repeated across groups. Consistent opinions were considered as valuable as well as strong disagreements among participants. Given the objective of the research about the attributes that influence the purchasing decision of consumers regarding lamb meat, statements of the participants were analysed further to determine the connections between the attributes and the role they play in purchasing decisions. The transcribed data were compiled in such a format that the results could be compared and divided into various categories. Content was also scrutinised for additional concepts that could be incorporated or acknowledged in terms of the study objectives.

4.5.10 Data interpretation

The final stage of the analysis was the mapping and interpretation of the data. It was not only to make sense of all the opinions and quotes but also to be imaginative and analytical enough to see the relationship between the quotes and the links between the data as a whole. As categories and patterns between them emerged in the data, the researcher engaged in the critical act of challenging the pattern that seems so apparent.

Seven criteria were used as a framework for interpreting the coded data

Words: Some of the actual words that were used during the focus group discussions and their meaning needed to be reconsidered as the participants showed little understanding of the terms and the terms thus needed to be redefined.

Context: The wording of the questions and subsequent comments made by others in the focus group discussions influenced the context within which the comments were made.

Internal consistency: Any changes in opinion or view or position by the participants as the discussions progressed have also been taken in consideration.

Frequency and extensiveness of comments: Frequency relates to consideration of how often a comment or view was made while the term extensive refers to the number of participants who expressed a particular view.

Specificity of the comments: Greater attention was placed on responses referring to personal experience as opposed to hypothetical situations.

Intensity of the comments: The depth of feeling in which comments or feelings were expressed was also considered.

Big ideas: Large concepts or ideas that emerged from the data were also taken into account.

4.5.11 Quality of the data

Credibility, transferability, dependability and confirmability are the major components that enhance trustworthiness of the focus group sessions conducted in the research. Just as a quantitative study cannot be valid unless it is reliable, a qualitative study cannot be transferable unless it is credible and it cannot be credible unless it is dependable.

Credibility and transferability are difficult to achieve in qualitative research (Lawless & Heymann, 1998:525; Babbie & Mouton, 2001:277). To achieve credibility the data collected was recorded to avoid loss or distortion of information. If several focus groups provide common themes, the same feedback and the same stories are repeated, then the observation can be made that there is some retest reliability in the sense that additional groups yielded similar information (Lawless & Heymann, 1998:525). Thus, if the same information is obtained from different focus groups, it can increase the trustworthiness of the data. Data collection will also reach a point where no new inputs or categories are gathered. This is called theoretical saturation that contributes to reliability (Babbie & Mouton, 2001:288). In the research, the participants were questioned to saturation and similar information was obtained. If this occurs, it enhances the trustworthiness of the data.

Credibility was also ensured through the technique of member checks. Member checks refer to the researcher's transcripts and interpretations that were taken back to the participants to check with them whether the data reflect what they had said and meant or not (Babbie & Mouton, 2001:276). The recorded notes and transcribed conversations were interpreted and analysed. Thereafter the participants of the focus groups were asked to verify the information so as to correct any errors.

Transferability refers to the extent to which the results or findings can be generalised or applied to other contexts or settings (Babbie & Mouton, 2001:277). From a qualitative perspective transferability is primarily the responsibility of the one doing the generalising. Transferability can be enhanced by doing a thorough job of describing the research content and the assumptions

that were central to the research. The researcher ensured that sufficient information was collected as accurately as possible and reported on with adequate detail and precision. Credibility and transferability, therefore, both contribute to trustworthiness that is described as “neutrality of its findings or decisions” by Babbie and Mouton (2001:276).

Dependability concerns whether the same results would be obtained were the investigation replicated with the same or similar respondents in the same or a similar context. In the research the respondents were questioned to saturation and similar information was obtained. The interview notes and audio recordings were also useful when enhancing dependability.

Confirmability refers to the degree to which the results could be confirmed or corroborated by others. It can be described as the ability to receive the information without distortion (De Vos, *et al.*, 2003:352; Babbie & Mouton, 2001:277), without any biases of the researcher being documented. To prevent this from happening, raw data was collected and made available as tapes to confirm the findings and to confirm the objectivity of the researcher. A number of strategies for enhancing confirmability can be used. The researcher documented the procedures for checking and rechecking the data throughout the study. After completion of the research a data audit could be conducted that would examine the data collection and analysis procedures and makes judgements about the presence of bias or distortion.

4.6 Phase 3: An overview of conjoint analysis

Conjoint analysis was used in the research since this is a type of method that is able to predict individual participant’s perceptions of a product very well (Hair, *et al.*, 2006a:464). According to Green and Srinivasan (1990) this technique gives the research a significant level of validity. Conjoint (to join together) is a quantitative market research technique with the objective of determining combinations of a limited number of product attributes that influence a respondent’s choice or decision to act. Through statistical analysis of the trade-offs made by the respondents, the relative importance of the different attributes of the product are estimated.

Conjoint analysis evaluates product attributes in a way that no other method can. Traditional survey approaches ask respondents to estimate how much value they place on each attribute. This is a very difficult task for any person. Conjoint analysis, on the other hand, attempts to break the task into a series of choices or ratings. These choices or ratings, when taken

together, allow us to compute the relative importance of each of the attributes studied. Instead of “stated importance”, conjoint analysis uses “derived importance” values for each attribute or feature. Thus conjoint analysis allows for defining consumer needs more accurately than is possible with the use of simple questionnaires. A brief summary outlining the nature and use of conjoint analysis is listed in Table 4.3.

Table 4.3: Summary of conjoint analysis
(North & de Vos, 2002:34)

Technique	What it does	What it is used for
Conjoint Analysis	Allows consumer preferences for a product or service to be broken down into trade-offs among its individual attributes, without separating those attributes from the context in which overall judgements are made	Optimising product configurations; studying price elasticities of demand; simulating market response to new or modified offerings; diagnosing competitive strengths and weaknesses

4.6.1 Description of conjoint analysis

The concept of conjoint analysis is described by Hair, *et al.*, (2006a:464) as follows: “Conjoint analysis is a multivariate technique used specifically to understand how respondents develop preferences for products or services. It is based on the simple premise that consumers evaluate the value of a product or service by combining the separate amounts of value provided by each attribute.” In real life, respondents may find it difficult to indicate which attributes they consider of value and how they combine the attributes to form their overall opinion. The value of conjoint analysis lies in the fact that it estimates how much each of the attributes is valued and as Churchill and Iacobucci (2002:748) state, “...the word conjoint has to do with the notion that the relative values of things considered jointly can be measured when they might not be measurable if taken one at a time.”

Two terms are central to conjoint analysis:

- **Utilities:** a measure of the effect each attribute has on product choice, given the range of levels included in a questionnaire. Utility is the most fundamental concept in conjoint analysis (Hair, *et al.*, (2006a:465). Moreover, utilities help us understand which product attributes or levels influence the ‘buy’ or ‘not buy’ decision.
- **Preference shares:** a measure of how consumers choose between different products in specific market situations.

Conjoint analysis is unique among multivariate methods in that a set of real or hypothetical objects is first constructed by combining selected levels of each attribute. Creating these combinations results in a **design**, which is the set of stimuli presented to the respondent. The respondents only provide their overall evaluations, a process termed the **conjoint task**.

A variety of standard statistical methods (depending on the software) is used to “decompose” the preferences of the participants, that is, to quantify the value placed on the various ranked attributes. These attributes and key terms should be addressed in order to gain an understanding of conjoint analysis:

- **Attribute** – product attributes are named factors – such as brand. Each attribute (factor) is then made up of specific scores awarded by the respondents at a specific level.
- **Factor** is the term used when describing a specific attribute or other characteristic of the product (Hair, *et al.*, 2006a:463).
- **Level** is a specific value or score describing a factor (attribute) (Hair, *et al.*, 2006a:463). Therefore for the attribute colour, the levels might be red, yellow, purple and so on. Attribute levels denote the possible scores assigned to the attributes (Malhortra, 2004:684).
- **Profile** or matrix is the combination of all possible levels of factors. For example, three (3) factors with two (2) levels each will create a 2x2x2 matrix, giving eight (8) profiles.
- **Utility** is an economic concept that is a subjective judgement of preference unique to each individual respondent, and is the most fundamental concept in conjoint analysis. The ‘utility level’ reflects a respondent’s level of satisfaction with consumption of such a product. It is the conceptual basis for measuring value. (Hair, *et al.*, 2006a:463). A respondent’s ‘utility’ measures relative preference for bundles of products and attributes that influence decisions that will optimize their satisfaction level after consumption.
- **Part-worth or weighted utility scores/values** are regression coefficients derived for each factor level, the attribute score (Malhorta, 2004:622) or that represent the importance of each aspect of a product in the consumer’s overall preference ratings (Hair, *et al.*, 2006a:464).
- **Relative attribute importance** is the relative importance attached to each attribute (Orme, 2010:79) depending on the relative range between maximum and minimum level utilities within attributes.
- **Conjoint simulators** are directional indicators, which can provide a great deal of information about the importance of relative features and preferences for products (Orme, 2010:81). Simulated profiles are created by software which is not presented to respondents. It

calculates how respondents would probably have rated them when compared to their answers when presented with profiles or cards.

Choice of Conjoint methodology

As no two products are exactly the same, there are different conjoint methodologies that can be used and a researcher should weigh each research situation. The three primary methods that can be used are:

- conjoint value analysis (CVA)
- adaptive conjoint analysis (ACA) and
- choice-based conjoint analysis (CBC)

CVA is the traditional, full-profile conjoint analysis that can display either one or two products at a time. The researcher decided to use a traditional conjoint value analysis design with pairwise comparisons so as to simplify the research design and to minimise the time required for completing the questionnaire. Furthermore, as the purpose of the research was primarily to assess the relative importance of the attributes and their levels, the advantages of adaptive and choice-based designs fell away. Only the main effects were incorporated into the research and no interaction effects were included.

In Table 4.4 some of the criteria that govern the choice of method are summarised.

Table 4.4: Conjoint methodology criteria
(Orme, 1996)

CRITERIA	CVA	ACA	CBC
Six or fewer attributes	x	x	x
More than six attributes	x	x	
More than nine levels per attribute	x		
Computerised questionnaire	x	x	x
Paper questionnaire	x		x
Interactions			x
Small sample size	x	x	
Individual-level utilities	x	x	

Producing a conjoint design (questionnaire) requires six basic steps, as discussed in the next section.

4.6.2 Basic steps in a conjoint design

Churchill and Iacobucci (2002:754) present a simple six stage model based on the critical decision points in a conjoint design. This model is used in the research and the six major steps are summarised in Figure 4.1.

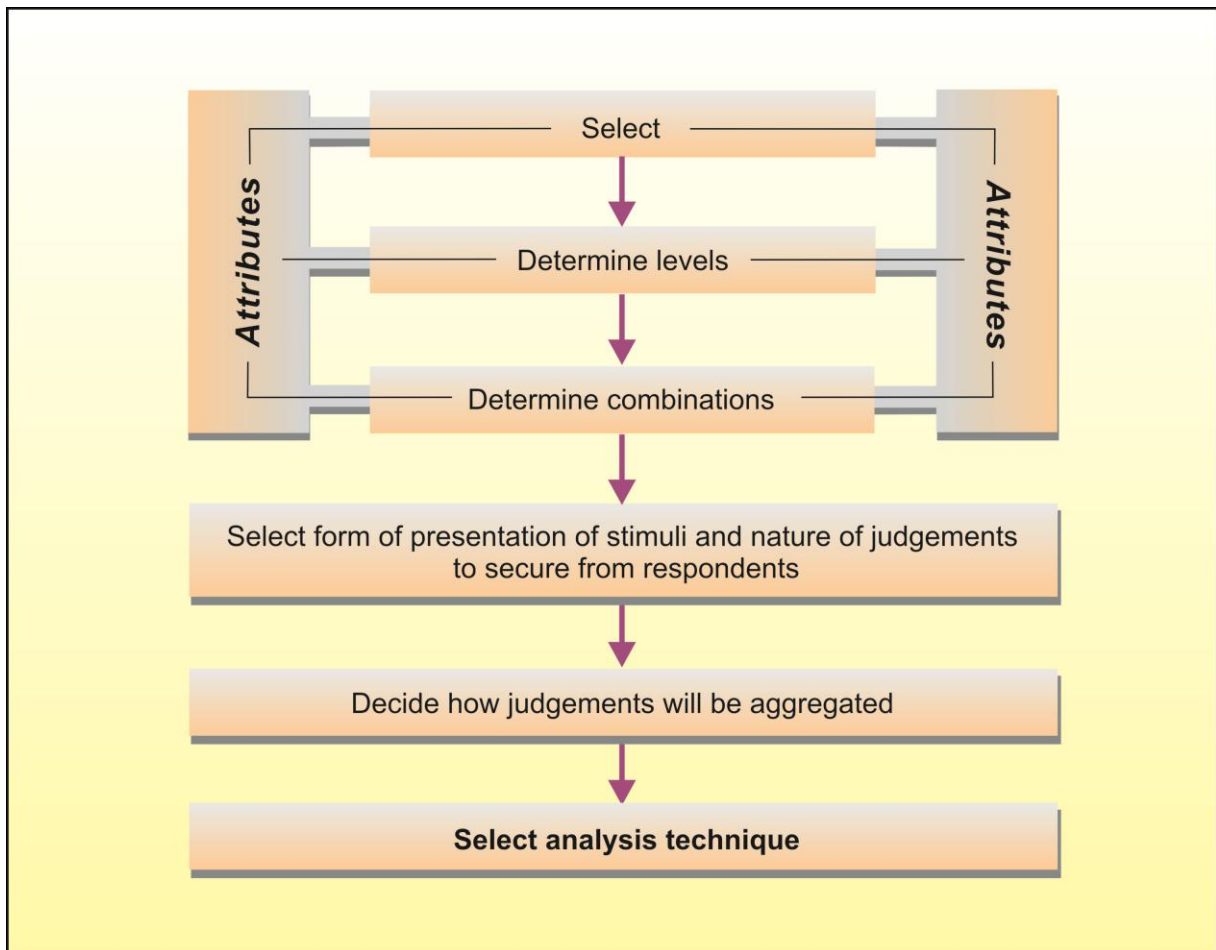


Figure 4.1: Basic steps when conducting a conjoint analysis design
(Churchill & Iacobucci, 2002:753)

The design should be applied when designing a conjoint analysis experiment. Each of the steps shown in Figure 4.1 (as applied in the research) is discussed next.

Step 1: Selecting the relevant ‘Karoo lamb’ attributes:

The single most important component of carrying out conjoint analysis was selecting the conjoint attributes and levels. Consumers do not consider each attribute of a food product singly and independently when making a purchasing decision, but will consider a whole range of product attributes in totality. When asked to do so outright, many consumers are unable to accurately determine the relative importance that they place on product attributes. For example, when asked which attributes are the more important ones, the response could be that they all are important.

Three focus group sessions (Phase 2) were conducted and the input of the 22 participants helped to refine the list of attributes concerning lamb features that would be most relevant to consumers in their decision-making process when purchasing lamb. The selected lamb meat attributes had to be critical in affecting consumers’ preferences and choices regarding the product, and had to be easily communicated for a realistic evaluation. The attributes also had to be distinct and easy to specify as respondents make comparisons between attributes due to the effect of trade-offs. Therefore the choice of attributes was important, as it would be futile to define a product in terms of irrelevant attributes.

Price was included in the research as, according to Steenkamp, cited in Wieranga, *et al.* (1997) it is one of the most significant product attributes when purchasing food and it adds reality to the profiles. Price is also included in most conjoint analysis studies as it is ideally suited to the trade-off nature of conjoint analysis (Hair, *et al.*, 2006a:483). The research objectives of the conjoint experiment part of the research necessitated the inclusion of traceability as a specific product attribute.

The product attributes chosen were *traceability, quality, safety, origin* and *price* (Table 4.5). The list of attributes was short enough to avoid respondent fatigue that can arise if there is information overload.

Table 4.5: Summary of product (lamb) attributes

Lamb attributes	
a)	Traceability
b)	Origin
c)	Quality
d)	Safety
e)	Price

Step 2: Determining the product attribute levels

Following the choice of the relevant attributes, their levels had to be determined. A number of factors had to be taken into account in selecting the attribute levels for the conjoint analysis accommodating the levels which the consumers might realistically face in the actual marketplace and the requirements stipulated for the research. The optimal number of attribute levels tested ensured satisfying the research objectives while minimising the burden faced by respondents in the data collection stage. The selected attribute levels also had to be communicable, reasonable, believable, actionable and capable of being traded off (Hair, *et al.*, 2006a:480).

The product attributes and their levels summarised a hypothetical situation in relation to what consumers might consider during the process of deciding to purchase lamb meat. The number of levels for each attribute had a direct bearing on the number of stimuli participants had to judge and directly affect the statistical efficiency and reliability of the results (Hair, *et al.*, 2006a:481). Churchill and Iacobucci (2002:754) suggest that the researcher make the range for the various attributes somewhat larger than the range normally found but not so large as to make the options unbelievable. This practice helps to reduce inter-attribute correlation but it also can reduce credibility, so the levels should not be too extreme (Hair, *et al.*, 2006a:484). Table 4.6 displays a summary of the selected levels for the Karoo lamb attributes as used.

Table 4.6: The selected levels for each of the relevant product attributes

Attributes	Attribute levels
Traceability	Trace to animal Trace to birth farm Trace to abattoir Trace to processing plant No trace
Origin	Origin: Local region Origin: National (SA) Origin: No region Origin: Specific region (Karoo)
Quality	Quality through certification Quality through labelling/branding Quality through origin Quality not assured
Safety	Safety through certification Safety through labelling/branding Safety through place of purchase Safety not guaranteed No safety knowledge
Price	10% more 7.5% more 5% more 2.5% more Same price 2.5% less 5% less 7.5% less 10% less

Five levels were selected for the attribute **traceability** in order to investigate the effect of the type of traceability on consumer decision-making when purchasing lamb meat. The levels were *trace to animal*, *trace to birth farm*, *trace to abattoir*, *trace to processing plant* and *no trace*. The level *trace to animal* showcased traceability in its most extensive form and was included as an example where traceability was to the benefit of the consumer.

As all agricultural products have specific geographic origins, some consumers differentiate products on this basis (Tregear, *et al.*, 1998:383) as place and product connotations become intertwined. Although attributes are used to help break perception of a product down into its components, when presented to respondents all they see are the levels. The following four levels for the attribute **origin** were chosen, *local region*, *national*, *no region* and *specific region, the Karoo*.

Quality is a qualitative attribute and choosing levels for this kind of variable is generally more difficult than choosing levels for quantitative variables such as price (Van der Pol & Ryan, 1996:6). Four levels were used, *quality through certification, quality through labelling or branding, quality through origin and no quality guaranteed*.

The five levels chosen for the attribute **safety** were *safety through certification, safety through labelling or branding, safety through place of purchase, safety not guaranteed and no safety knowledge*.

Price as an attribute is included in many conjoint studies because it represents a distinct component of value for many products being studied (Hair, *et al.*, 2006a:483). In determining the price levels, the number of price levels were kept manageable and the price intervals were not too large. A minimum and maximum price level was identified. The attribute levels need to be salient in influencing consumer preference and choice.

From the information given in Table 4.6 a reasonable assumption would be that many consumers would probably prefer the cheaper or medium priced lamb meat above the more expensive lamb meat with full traceability back to the Karoo in place. This may, however, not necessarily always be the case because the more expensive lamb meat with full traceability in place may provide the consumer with a type of guarantee that the quality and safety of it will be better, or that it would be more appropriate to the lifestyle to which the consumer aspires. Prospective buyers may therefore find it necessary to trade-off something about one feature to secure more of another. The key question then is to determine how the buyers value these specific attributes. For example, is low price valued more highly or are consumers willing to pay a higher price to secure some of the other features of the product?

The levels for *price* were chosen in a way that the middle level reflected the average price of lamb meat. Levels were then varied around this middle level such that price sensitivity of consumers could be tested while maintaining a realistic scenario. The levels for *quality, safety, origin* and *traceability* were also chosen in such a way so as to not be unrealistic and too extreme.

Step 3: Determine the attribute combinations

In step 3 the attribute combinations were determined that were used in the profile design. A particular product has a profile comprising of attributes and their levels. When using conjoint analysis a product is deemed to consist of various attributes. In Figure 4.2 attributes A, B and C each have several possible levels, A1, A2 and A3. Several attributes form a profile – in Figure 4.2 the profile comprises **A3, B2 and C1**.

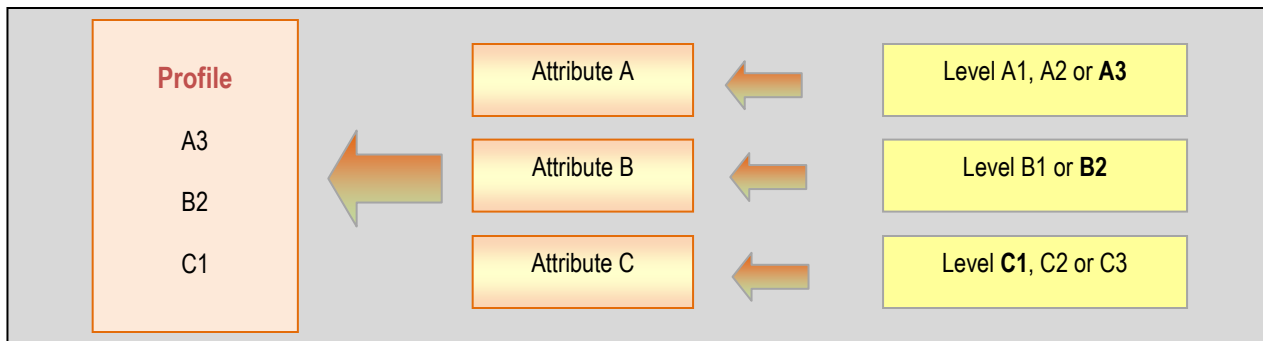


Figure 4.2: Relationship between profiles, attributes and levels in conjoint analysis
(Van Zyl, 2008)

Having established the relevant attributes and their levels, hypothetical scenarios or product descriptions with different combinations of attributes were presented to the respondents. The total possible number of scenarios equals the product of the number of selected product attributes and the number of selected attribute levels. This can result in numerous possible combinations and scenarios, the key problem of conjoint analysis.

In the research the number of attribute level combinations was calculated as 3600 as $5 \times 4 \times 4 \times 5 \times 9 = 3600$ (See Table 4.6). Clearly it would have been unrealistic to assume that respondents were able to choose among so many alternatives and it would have not been feasible for the researcher to draw conclusions of the choices made by the respondents. This problem can be solved by using an appropriate experimental design. The experimental design aims to keep the number of observations as small as possible. It sets the criteria to obtain the preference information from more than one respondent using an aggregate analysis e.g.

- Full factorial design: all possible/potential attributes are compared
- Fractional factorial design: finds the minimum number of product attributes which are necessary to use in the research yet simultaneously providing all the information required regarding the number of choices reduced while still delivering meaningful aggregate results.

Moreover it should allow for the full representation of each of the attributes and their respective levels in an unbiased manner (Hair, *et al.*, 2006a:497). Fractional factorial design was used in this research.

Step 4: Choosing a presentation model and the nature of the judgements required from the respondents in the survey

Various types of models can be used to present the constructed profiles to the respondents. The choice between the presentation methods focuses on the assumptions regarding the extent that consumer processing is performed during the conjoint task, and the type of estimation process being employed (Hair, *et al.*, 2006a:493).

- **Trade-off method:** attributes are presented two at a time and respondents rank all combinations of the levels in terms of preference (Hair, *et al.*, 2006a:464).
- **Pair-wise comparison method:** is the method of presenting a pair of profiles to the respondent for evaluation, with the respondent selecting the preferred scenario (Hair, *et al.*, 2006a:463). Comparing two products side by side helps to draw finer distinctions between products offering different features, but may be more difficult because each question requires an understanding of two concepts instead of only one.
- **Full-profile method:** the complete description of the scenario across all attributes is presented for evaluation. This approach is applicable when the number of attributes will not cause difficulties for the respondents to differentiate between the various hypothetical product descriptions (Hair, *et al.*, 2006a:462). The full-profile approach can lead to problems when there are many product attributes, causing information overload.

Pair-wise presentation can be useful for computer-administrated conjoint questionnaires and was used in the present research because more information could be gathered in this way. Consumer preferences can be measured by rank ordering or rating. The full-profile and pair-wise comparison methods can employ ranking or rating data (Hair, *et al.*, 2006a:499). In the rank order preference measure, the respondent ranks the profile cards from most preferred to least preferred. Rating of preferences on a metric scale is the second possibility in order to measure consumers' preferences. The profiles were presented in the research pair-wise with a 9-point semantic differential rating scale requesting the respondents to indicate their preferred profiles.

Different presentation forms can be used to present the attribute combinations to the respondents, namely:

- oral descriptions
- written descriptions and
- pictorial or graphic representation

The nature of the judgments that must be secured from the respondents relates to the form in which the question is presented.

Step 5: Decide how judgements will be aggregated for analysis

This step basically involves the decision whether the responses from consumers or groups of consumers will be aggregated and, if so, how this will be done.

With carefully constructed conjoint analysis, it is possible to statistically deduce from the values the consumer allocates to each feature, since it is possible that the respondents may actually be subconsciously using a ranking approach to evaluate the concept. The analysis mode of conjoint data yields a series of scores for each respondent for each attribute level. These scores, known as part-worths, may be likened to utility. This is seen to be an arbitrary measurement of utility that consumers associate with a product and its attributes. Each score reflects the value the respondent gives each attribute level and is the building block from which the entire analysis is conducted.

The aim of estimation is to approximate the part-worths for every attribute level. For a given sample, the researcher faces the choice of either estimating models for each respondent or using an aggregate model for the sample as a whole. There are three choices: use individual responses; pool all responses into a single utility function; or define segments of respondents who have similar preferences. For this research the attribute importance and part-worth weighted utility values of attribute levels were calculated per individual for each of the selected scenarios. These are numeric values reflecting the desirability of different specific features (Vag, 2007:905). The results will be presented in Chapter 5.

Step 6: Select the appropriate conjoint analysis technique to conduct the analysis

The final step in the design is to select the technique for analysing the data. The choice depends largely on the method used for obtaining the input judgements from the respondents. For example, when rank-order data has been obtained, the assumption of a linear relationship may be dubious so a non-metric regression model may be substituted to estimate the utilities (Churchill & Iacobucci, 2002:759). In the research ranked data was not used but respondents were required to compare one product with another (rating rather than ranking). Ordinary linear regression was used in the research to estimate the part-worth value of the attribute levels.

The two standard statistical methods to calculate respondent utilities in CVA are ordinary least squares (OLS) or monotone (non-metric) regression. OLS is comparatively quick and can provide valuable diagnostic information about the quality of the calculated utilities. However, its application is not appropriate for ranked conjoint data. For OLS to be appropriate, the assumption should be that the data are 'scaled at the interval level'. Thus data was scaled so that the real differences between the items being measured were communicated by the arithmetic differences in their values.

4.6.3 The conjoint analysis electronic questionnaire

With the advancement of information and communication technology, researchers have found new methods of data collection and analysis, such as the use of the internet in research. The internet, as a vehicle for data collection, could promise an increased sample size, greater access and convenience, lower costs and time investment as well as having many other appealing features (Benfield & Szlemko, 2006:2). Internet-based data collection, if utilised properly and with discretion, can also make unfunded projects feasible as it reduces costs, yields larger and more representative samples and obviates many hours of data entry (Benfield & Szlemko, 2006:3).

In using the internet for primary data collection a number of issues are encountered, such as technical snags arising from power failures, data cleaning requirements, respondents lack of skills and familiarity with computers, poor reading comprehension on the part of the respondents, low response rate and ethical issues. When conducting internet surveys there is a potential threat to the anonymity of the respondent that needs to be considered, as it is possible

that the Internet Protocol (IP) address of the computer being used by the respondent may be recorded. Another disadvantage of an electronic format is the lack of rapport with the respondent. The impact of such rapport may be unpredictable (Benfield & Szlemko, 2006:3).

By using the internet as a medium to contact people, geographical barriers do not count as much as before and people can be interviewed, who could not have been interviewed before. In addition, participating in an interview or survey on a computer at home causes less stress for a participant compared to a personal interview which is conducted in a public place (Klein, Nihalani & Krishnan, 2010:2). Compared to paper and pencil methods, conjoint analyses have another advantage. Since it is a computer-based data gathering process, the data that is gathered digitally can be transferred to statistical programmes more easily and thus it is simpler to check than data gathered through paper-based interviews (Klein, *et al.*, 2010:2).

Web-based surveys have special problems and unique advantages as can be seen in Table 4.7.

Table 4.7: Advantages and disadvantages of using the web as research venue
(Cooper & Schindler, 2011:251)

Web advantages	Web disadvantages
Short turnaround of results – results can be tallied as respondents complete surveys	Recruiting the right sample is costly and time consuming – unlike phone and mail sample frames no lists exist
Ability to use visual stimuli	Converting surveys to the web can be expensive
Ability to do numerous surveys over time	It takes technical as well as research skills to field a web survey
Ability to attract respondents who would not normally participate in another research project	While research is more compatible with numerous browsers the technology is not perfect
Respondents feel anonymous	
Shortened turnaround from questionnaire draft to execution of survey	

Research has also shown that compared to non-computer-based approaches, computer-supported conjoint analysis tools allow researchers to examine a larger number of product attributes. This means that much more complex products can be evaluated (Mennecke, Townsend, Hayes & Lonergant, 2007:2640).

Constructing the electronic questionnaire

As with any conjoint method it was essential to pre-test the questionnaire (a pilot study):

- the questionnaire was answered by the researcher and the data analysed to make sure the utilities mirrored the researcher’s own values

- a sample of relevant respondents were asked to answer the questionnaire to determine the optimal number of questions to ask, and to investigate whether the questionnaire was too difficult
- a sample of relevant respondents answered the questionnaire and the data was analysed to conclude that the resulting utilities were reasonable

Once the set of hypothetical lamb meat products was designed the questionnaire was presented to participating respondents in an electronic format via the internet. The web-based questionnaire is a measurement instrument both delivered and collected via the internet. In ratings-based conjoint analysis product concepts can be shown to respondents one at a time or they can be presented in pairs. Pair-wise presentation can be more difficult for the respondent because each question requires the understanding of two concepts instead of one. Pair-wise presentation is particularly useful for computer-administrated conjoint questionnaires and was used as presentation method as respondents compared two products side-by-side and finer distinctions could be drawn by them.

Conjoint analysis input data can be either non-metric, where the respondents rank their evaluations, or metric, where the respondents provide ratings (Malhorta, 2004). In the research the metric approach was used where the respondents rated the different profiles on a 9-point rating scale to indicate preference for the profiles presented on the left and right hand of the page. This was more convenient for the respondents and also easier to analyse. The respondents were asked to arrange them according to their preferences. These partial utility scores were used to describe the characteristics that have most influence in their overall preference for the product, as well as for the relative importance of each attribute.

The structure of the questionnaire is portrayed in Table 4.8 in terms of the different sections of the questionnaire and the specific concepts measured. The questionnaire comprised three parts with the socio-demographic data of the consumers identified being in the third part of the questionnaire.

Table 4.8: Composition of the questionnaire

Section of the questionnaire	Concepts measured
a) Question 1 - 37	a) Preference for lamb
b) Question 38 - 45	b) General questions
c) Question 46 – 56	c) Demographic data

In the questionnaire (questions 1 – 37) the respondents were presented with a set of trade-off questions and asked to choose between a pair of lamb profiles. This section was the core of the questionnaire and was designed to force the respondent to make trade-offs between pairs of grouped attributes. Each pair-wise description had five different combinations of attribute levels and the respondents were asked which of the two lamb profiles they would be more likely to choose. The respondents were asked to rate the set of profiles according to their preference, from strongly prefer to the left, to strongly prefer on the right, by entering a rating score, as can be seen in Example 1 of the question format. The same questions were presented to all respondents.

Example 1: Question format

The pair-wise comparison method is a way of presenting a pair of stimuli to a respondent for evaluation, with the respondent selecting one stimulus as preferred (Hair, *et al.*, 2006a:463). The respondents were asked to compare two profiles, as shown below:

When you have to choose between two options of Lamb to buy, which of the following would you prefer?

Lamb that has no traceability information and originated from a national region (e.g South Africa) where the quality is assured through certification, knowing that the safety is not guaranteed, and I am willing to pay 7.5% MORE than the current price/kg

or

Lamb that is traceable to the processing plant and originated from a specific region in the country (e.g Karoo lamb) where the quality is assured through origin, knowing that the safety is guaranteed through certification, and I am willing to pay 10% LESS than the current price/kg

Strongly Prefer Left

Somewhat Prefer Left

Indifferent

Somewhat Prefer Right

Strongly Prefer Right

With the small numbers of attributes, the paired comparison format had desirable characteristics. When respondents compare two products side-by-side, they can draw finer distinctions between products offering different features. However, the pair-wise questionnaire only captures the relative differences in a respondent's preferences for the attribute levels.

Example 2 of the electronic questionnaire (Pair-wise presentation)

The profiles are presented pair-wise with a 9-point semantic differential rating scale requesting the respondents to indicate their preferred pair. The pair-wise design shows one product concept on the left and another on the right.

When you have to choose between two options of Lamb to buy, which of the following would you prefer?

<p>Lamb that is traceable to the abattoir and originated from a specific region in the country (e.g Karoo lamb) where the quality is assured through certification, knowing that the safety is guaranteed through labelling, and I am willing to pay 2.5% LESS than the current price/kg</p>	or	<p>Lamb that is traceable to the animal and originated from a national region (e.g South Africa) where the quality is assured through origin, knowing that the safety is guaranteed through place of purchase, and I am willing to pay 7.5% LESS than the current price/kg</p>
<input type="radio"/>		<input type="radio"/>
Strongly Prefer Left	—————	Somewhat Prefer Left
	—————	Indifferent
	—————	Somewhat Prefer Right
	—————	Strongly Prefer Right

4.6.4 Data analysis

Conjoint data was processed by statistical software written specifically for conjoint analysis. The SSI Web v6.6 conjoint software package from Sawtooth Software Inc (2009) was used in this research to determine conjoint part-worths within each attribute, and conjoint importance for the attributes relative to one another too was assessed. This analysis was carried out at the individual level and consolidated to total levels.

The technique selected for analysing the conjoint data depends on the method that was used for obtaining the input judgments from the respondents. With conjoint value analysis (CVA) either ordinary least squares (OLS) or monotone (non-metric) regression could be used to calculate utilities. For OLS to be appropriate the assumption should be that the data are scaled at the interval level and was thus ratings-based. This required data to be scaled so that real differences in the items being measured were communicated by the arithmetic differences in their value. OLS as calculation method was used in the research.

When CVA calculates utilities using OLS the term *r-squared value* is used. R-square indicates how well the data fit the model and is therefore a goodness-of-fit measure (Malhorta, 2004). The role of any goodness-of-fit measure is to assess the quality of the estimated model by comparing actual values of the dependent variable(s) with values predicted by the estimated model (Hair *et al.*, 2006a:506). *R-squared* is a squared correlation index, indicating the proportion of variance of the optimally scaled data that can be accounted for by the multi-dimensional scaling procedure (Malhorta, 2004). Values range between 0 and 1 and a high *r-square* value indicates that the data fits the model well. However, extremely high values may be suspect in that they do not reflect good fit, but rather fundamental problems in the estimated preference structure of the of the choice process itself (Hair, *et al.*, 2006a:507).

The actual values obtained by the statistical methods are useful, but the relative values or relationships between each of the attributes are more important:

- Relative values evaluate respondents' answers in a manner that reveals the true underlying value that is consciously or subconsciously placed on each attribute
- Conjoint analysis computes the relative value of all options considered in the research design

Conjoint analysis applies a complex form of analysis of variance to a respondent's data to calculate a utility for each level of each attribute. Utilities are basically index numbers which measure how valuable or desirable a particular feature is to the respondent (Hair, *et al.*, 2006a:465). A respondent's utility is a measurement of the relative strength of preference for each level of each attribute of 'Karoo lamb'. Once you have the utilities for each attribute level, a product's value is calculated by summing the utilities across all the attributes that define the product. For each attribute, the attribute level most closely associated with the product is selected and its utility noted. Analysis allows finding out which attributes of 'Karoo lamb' have

most value to consumers and how consumers are likely to react to different product configurations.

The coding and data screening was done by the researcher, while the data entry and analysis was conducted with the help of the marketing research firm, Consulta Research (Pty) Ltd, located in Centurion, Gauteng, South Africa. Tables and graphs were used to support the findings of the research.

4.6.5 Assessing the validity and reliability of the conjoint results

In research, validity assesses the quality of the data in terms of its accuracy and relevance for the purpose of the research endeavour and the degree of efficiency of the data gathering methods used (McGivern, 2009). For internet-based conjoint analysis the following precautions had to be taken to ensure a high degree of reliability and validity:

- Use as many criteria as possible to test the reliability and validity of the analysis
- Use incentives to motivate the respondents to give reliable responses
- Encourage respondents to give feedback and use as much of this information as possible
- IP addresses and personal data should be controlled for double counting whenever the participation is based on a self selection of respondents
- Analysis at the individual level should precede aggregate analysis to identify “bad data”

The validity of conjoint analysis results can be examined by using different validity criteria. In general, validity can be assessed in terms of internal and external validity. Internal validity refers to those changes in the dependent variable, in this case the purchase of ‘Karoo lamb’, that are due to the effect of the independent variables, namely, *traceability*, *safety*, *quality*, *origin* and *price*, and not to extraneous variables. The better the design of the research, the more internal validity the research gains (McGivern, 2009). The size of the sample and the sampling method is crucial for the external validity of the results. External validity, however, indicates that it is possible to generalise from the sample size to a larger sample or population to enhance the merit of the research (McGivern, 2009).

Another threat to internal validity refers to the nature of experiences that the participants might have had during the experiment that would affect their behaviour. This was avoided by making the experiment clear to them and seeing that it was relatively short. The participants had to rate

the alternatives which meant that had to use their minds creatively. This feature also prevented them from getting bored. The fact that the participants in the experiment were randomly chosen helped to overcome the problem of biased results.

Reliability refers to getting the same or similar results from the data collected using the same method but on different occasions. This means that the data gathered one day should have similar outcomes to data collected on another day (Kumar, 1999). Meeting this criterion would supply consistent results (Cooper & Schindler, 2011:283). A measurement may be reliable and not valid. However, if a measurement is valid, then it also is reliable and if it is not reliable, then it cannot be valid. Reliability can be divided in two groups, external and internal reliability. External reliability is described as the measurement level of consistency during the time of the research.

Reliability for the data was examined by using the software program SSI Web v6.6 (Sawtooth Software). When conducting the conjoint analysis the software also looked for correlations between the observed and estimated values. An important aspect of reliability in the study is how well the experiment was understood by the participants. Reliability might have been threatened by the fact that, when the researcher explained the experiment and the different attributes too carefully that the respondents answers could have been biased to please the researcher. Another point might have been that the profiles created were too much like real-life situations so that the respondents would take the experiment seriously. By using a cover letter to draw attention to the purpose of the research, and the researcher's association with the University of Pretoria together with the guarantee that the information would be treated as confidential and anonymous, met with Mouton's (1996:149,157) observation that such action would increase the study's level of reliability. The fact that the respondents who participated did so of their own free could also have increased the reliability level of the responses.

The quality of the responses and the conjoint data was measured according to the following criterion: estimating part-worths using OLS-regression provided with a r^2 a measure of internal consistency (goodness-of-fit measure). This gives the first indication of the reliability of the judgement. The interpretation of this measure can, however, be misleading and must be made carefully. Two specific problems related to the distribution of responses. A high r^2 can result from "bad data" (e.g. due to response patterns without any variance) and a low r^2 can result from using only the extremes of the graded scale.

4.7 Study population

To research a whole population would require time and cost. Therefore one can examine a selected subgroup from the whole group. A target population is “a specified group of people or objects for which questions are asked or observations made to develop required data structures and information” (Hair, Bush & Ortenu, 2006b:65). One of the advantages of using the internet as a medium to recruit people to participate in a questionnaire is that geographical barriers do not count as much as finding people to be interviewed who had not have been interviewed before (Klein, *et al.*, 2010).

For the purpose of the research the unit of analysis was consumers who purchase Karoo lamb in a specific geographical area, namely the country of South Africa, who were 18 years and older and who could understand English. As the conjoint analysis questionnaire was conducted electronically with the assistance of the marketing research firm, Consulta Research (Pty) Ltd, based in Centurion in Gauteng, South Africa, all the consumers who participated in the survey were part of the consumer panel of consenting survey participants of Consulta.

4.8 Sampling procedure

A sample has to faithfully represent the populations from which it was drawn in order to represent the population (Mouton, 1996:136). The major reason for sampling is feasibility as the complete coverage of the total population is seldom possible, practical or ethical (De Vos, *et al.*, 2003:199). A sample is therefore a subset or part of a larger population. There are several alternative ways of taking a sample and the major alternative sampling plans can be grouped as non-probability or probability techniques (Zikmund, 2003:369). Probability sampling occurs when all elements within the population have the same chance of being selected for the research. For all the elements to have an equal chance of being selected, the researcher requires a sampling frame (Malhorta, 2004). In non-probability sampling the researcher chooses elements in a non-random way, indicating that the different elements will not have the same chance of being selected (Hair, *et al.*, 2006b). The elements may be selected according to some traits or characteristics the researcher is trying to find (Saunders, *et al.*, 2003).

Non-probability sampling uses different sampling techniques, for example, convenience, quota, judgmental, theoretical and snowball sampling. A mix of convenience and judgement sampling

was used in this research to reduce the problems that might arise when just using one of these. Convenience sampling is the less rigorous technique and involves the selection of the most accessible subjects. The advantage with convenience sampling is that the researcher can conduct a large amount of sampled data within a short time, though the problem is that it does not necessarily show the representiveness of the sample (Hair, *et al.*, 2006b).

Judgemental sampling is a way of conducting convenience sampling, where the researcher chooses the elements based on the belief that the element is representative of the population (Hair, *et al.*, 2006b). The problem with judgmental sampling is that the extent to which it is representative of the total sample cannot be measured.

An appropriate sample size for a quantitative study is one that gives adequate data that will address the research question fully (Marshall, 1996:523). For simple questions or very detailed studies, the sample size might be in single figures. For complex questions large samples and a variety of sampling techniques might be necessary (Marshall, 1996:523). To acquire reliable and valid data the sample size must be well thought through, even though it does not guarantee unbiased results since these can be affected by other parts of the research process (McGivern, 2009).

Data was gathered from respondents solicited from the consumer panel of consenting survey participants of the marketing research firm Consulta Research (Pty) Ltd, based in Centurion, South Africa, as the conjoint experiment was internet-aided and conducted electronically. A total of 1011 questionnaires were distributed electronically to individual consumers during October and November 2009 with the help of the marketing firm and 608 completed surveys were returned to them electronically. The response rate was 60.14%. A total of 352 of these completed questionnaires met the criteria required for data analysis, i.e. respondents bought and/or consumed mutton or lamb and were therefore able to express views and give opinions about the product under investigation.

Only willing people were part of the research and those who were not willing were excluded from the research immediately as if they were never part of it, which helped to decrease the number of errors in the data. A respondent was eligible for recruitment to participate in the conjoint questionnaire if mutton or lamb had been purchased and/or consumed.

4.9 Summary

In this chapter the research design for Phase 2 and Phase 3 of the research was described. All the different methods, techniques and procedures that were necessary to solve the research problem were explained and justified. The manner in which the collected data was analysed also received attention. Measures taken to ensure that the collected data was valid and reliable throughout all data collection phases were noted.

CHAPTER 5

RESULTS OF THE FOCUS GROUP AND CONJOINT ANALYSIS

5.1 Introduction

In this chapter the results obtained from the focus group sessions (Phase 2) and the conjoint analysis (Phase 3) are presented and discussed according to the phases in which the study was conducted and in terms of the specific research objectives. Results are given in both tabular and graphic format.

The importance of product attributes with regard to consumer decision making, as found in the literature, was underscored in Chapter 2. The constructs, as identified through a study of these various sources, were used to structure the initial content of the conjoint analysis experiment in terms of the attributes that influence consumer decision making concerning the purchase of lamb meat. Furthermore, comments made during the focus group discussions contributed to the final composition of the conjoint questionnaire as they allowed for the inclusion of new and additional constructs that might not have been identified from the literature review.

The results from Phase 2, primarily based on a qualitative approach, particularly from the focus groups, are presented and discussed in the following section.

5.2 Phase 2: Focus groups - results and findings

The focus group discussions were held to address a specific objective of the study: to determine and describe the product attributes that influence consumers' purchasing decisions of 'Karoo lamb'. Achieving this objective provided information that assisted in structuring the content of the conjoint questionnaire in terms of the attributes that influenced consumer decision making as applicable to 'Karoo lamb'.

5.2.1 Focus group discussions

This part of the research project was qualitative in nature and was considered the most appropriate method to achieve specific parts of the objectives of the research. The purpose of focus groups is not to make generalisations about a population, but to obtain broader insight

into, and a better understanding of how people perceive a specific concern. The purpose is thus to explore rather than to describe or explain in any definite sense (Babbie, 2010:322).

Three focus group discussions, one attended by black participants and two by white, were conducted during April 2009 in the Gauteng province of South Africa according to the procedures described in Chapter 4. Ethnic subcultures were included as previous research has shown that differences in lifestyle and consumer spending patterns exist between population groups and it was important to investigate the attributes that influence the decision making of both consumer groups in purchasing lamb.

A total of 22 participants with ages that varied between 25 to 60 years of age, comprised the focus group. Discussions were held on three different mornings and each one lasted approximately one hour. The majority of the participants, in total 20 of the 22, were female. Women are usually responsible for most of the food purchasing in South African households thus having a majority of woman in the groups did not present a bias. Many authors are, however, of the opinion that gender roles are changing and that woman are no longer solely responsible for purchasing household groceries (Cant, *et al.*, 2006:214; Solomon, *et al.*, 2006:410). This divergent view was tested during the conjoint analysis experiment of the research.

As the first step in qualitative data analysis is to assemble all the data, detailed field notes were taken during the focus group sessions and attention was given to the dynamics that took place in the group. What the participants in the group say constitutes the essential data in focus groups (De Vos, *et al.*, 2003:306). The transcribed focus group discussions were added to the field notes to compile a comprehensive data set. Data analysis was largely guided by the research problem and the aim of the research.

The attributes were pre-selected from a wide-ranging literature review and compared to previous studies. The focus group discussions allowed for inclusion of additional information that might not have been taken in consideration already. Moreover they were held to confirm whether the product attributes did indeed play a role in the consumer decision-making process, as per one of the set primary objectives of the research as described in Chapter 1.

In the following section the findings of the different focus group discussions are reported on and analysed:

5.2.1.1 Familiarity with the name Karoo lamb

Findings from the focus groups indicated that the majority of the participants in all three focus groups were familiar with the name Karoo and associated it with desert, farming, flocks of sheep and lamb meat. It was important to verify from the outset that the participants had in fact heard of, and were familiar with the Karoo as a geographical area, so that their input had value. Participants saw the Karoo as a very dry, rural area but also acknowledged it as a unique part of South Africa. Participants also associated the Karoo with wide open spaces, lots of dust, windmills and farming activities that not only involved sheep but also ostriches. They mentioned that they saw the Karoo as a tourist destination for visiting the Cango caves only but if 'Karoo lamb' was on the menu at an establishment they would prefer to choose it when dining during a visit to the Karoo. Generally, in normal day-to-day purchasing of meat, 'Karoo lamb', if available, was considered by a section of the participants as very expensive and reserved for purchasing for special occasions only. Having the name 'Karoo' linked to lamb was clearly associated with superior quality meat but participants were less sure - ...*I don't know* ... - about the reference to where it came from or if it was merely labelled lamb in a non-specific way.

5.2.1.2 Identification and description of product attributes

Traceability: The concept traceability was understood by participants to be where the lamb/sheep comes from, the origin. According to Lichtenberg, *et al.* (2008:1), consumers understand traceability differently for different products and will differ in how strongly they value the necessity of meat traceability. The majority of participants did not have prior knowledge of the fact that a retailer in South Africa is able to trace meat back, to a certain extent, to its origin, whether farm or abattoir, and questioned the value of it. The overall feeling was that maybe it could be useful information when people get sick from eating contaminated meat. Responses varied from indifference ... *I don't care where a product comes from* ... to ... *that would be the retailer's responsibility*... implying that, for a consumer, it had no real use. The overall feeling was that traceability had more use and significance for a retailer as it enabled them to solve a complaint more easily. In a study by Hobbs, Von Bailey, Dickinson and Haghiri (2005:47-48) it was established that traceability in the absence of quality and safety verification is of limited

value to individual consumers. Some participants felt that traceability gave them confidence in a product because the product appeared to be safer. As consumers they felt safer knowing that the product is traceable and that such information is available when needed. In this context responses ranged from ... *I attached the word safety to traceability* ... and ... *not only safety, also quality, because a product that is traceable is safe but also guarantees quality* ...

Quality: All the participants had very definite feelings about the perceived quality of meat and the way that quality influences their purchasing behaviour. Literature confirms that food safety and food quality seem to be two very important elements of people's conceptions of food and hence are associated with decision making (Van Rijswijk & Frewer, 2006:2; Hobbs, 2003:1). The freshness of the meat as seen in the colour, a definite light red in contrast to dark red meat, seen as old meat, plays a crucial role in their decision making. Good quality meat was also seen as meat with very little visible fat. Responses such as ... *less fat, I don't like fatty meat* ... and ... *I don't pay for fat on meat, it must be removed* ... indicated their strong feelings about quality ... *I want safe and quality meat. I don't want to give my family meat that is not safe or has bad quality, as they need the nutrients* ... indicated that the participants felt that good quality of meat is very important. Some participants were willing to pay a premium for good quality and safe lamb that is certified Karoo meat. Dickinson and Bailey (2002) and Hobbs, *et al.* (2005) investigated willingness to pay for traceability and both found that consumers are willing to pay a small premium for traceability but that consumers are willing to pay more for traceability attached to other valuable attributes such as enhanced food safety and quality. This view is also reflected in the value of the name 'Karoo' that is attached to lamb and confirms the importance of the specific name 'Karoo' in consumers' minds.

Safety: Participants linked the concept of traceability with safety in a product. Comments included ... *feel safer knowing that this product is traceable* ... Some participants felt that certified lamb influenced their decision making as ... *quality and safety go hand in hand* ... and that they will pay more for it. According to the findings of Verbeke (2001:254), traceability systems are considered to be indispensable in assuring product safety as, through traceability, specific food safety levels can be guaranteed for the consumer.

Animal welfare: Participants felt that the welfare of animals does not play a major role in influencing them to purchase only certain lamb meat but expressed the feeling that it is the responsibility of the retailers to ensure that animals are treated well. In a study done by

Schröder and McEachern (2004:169, 175) it was found that consumers simply delegate responsibility for ethical standards and conformance to those standards to the supply chain and government. A possible reason for delegating responsibility was described as resignation, where a consumer felt resigned to being powerless to effect change, believing that their individual consumption habits would not make any difference to the status of animals.

Labelling: For some participants the label was the single most important attribute that influenced them to buy lamb as they are able to see in a single glance the price, sell-by and processed dates, weight, fat content, cut and a certification/logo. A study conducted by Verbeke and Ward (2006:453, 454) confirmed that product labelling can be viewed as an instrument that regulates the presentation of product specific information to consumers. Consumers can weigh up the contents of labels and/or specific cues on labels against other characteristics or attributes during the stage of product evaluation in their decision-making process.

For the majority of participants the price per kilogram and sell-by date was the only information on the labelling of lamb that influences them to purchase lamb. *I look at the price and date and then take it ...* Participants also preferred simplistic labelling without a lot of information that can confuse them, and felt that certification stamps and logos were worthless to them unless they know exactly what the meaning is. A comment like ... *the more description on the label makes the product better ...* and ... *the more detail, the better trustworthy the product is ...* was also heard.

Regional product (origin): Participants felt that the name Karoo added value to a meat product and that the name Karoo can be associated with quality. Previous literature studies confirm that the origin of a product includes a collection of meanings that the consumer associates with it (Luomala, 2007:122). The participants preferred to purchase lamb meat that was guaranteed from the Karoo as it has a better and different taste because the sheep graze on shrubs. If the origin of the lamb is stated and guaranteed through certification on the label it would add value to the product. Comments included ... *I attach quality to a name and would like to know from where the lamb originates, it will help in my purchase decision ...* participants also indicated that they felt that local meat is safer because they know where it comes from and prefer it to imported meat. Kelly, *et al.* (2005) declared that consumers are increasingly concerned about the origin of the food they eat because of a decreased confidence in the quality

and safety of foods produced outside their local region or country. A small group of participants felt that origin is unimportant and that origin is only useful for advertising a product.

Price: All the participants had very strong feelings regarding the price that they were willing to pay for lamb. In response to the question whether the name Karoo would have an influence on their purchase decision when buying lamb, some participants replied that they buy any type of meat as long as it is cheap, whether the lamb is from the Karoo or Australia. This indicated that consumers are very price sensitive. Other participants replied that they would pay more for a product of quality. This response indicated that other attributes, apart from price, were also important to them and that some participants were willing to pay a higher price for lamb if they were convinced that they were receiving value for money. Du Plessis and Rousseau (2003:243) confirm that price is often linked to the quality of the product for the South African consumer. This is confirmed by comments as ... *because it costs so much, you assume that it is better* ... Taljaard, *et al.* (2006:223), came to the conclusion that the effects of non-economic factors, like issues pertaining to safety, quality and animal welfare, are becoming more important to consumers than in the past.

Place of purchase: The place most frequently mentioned by all participants for purchasing meat was at large retail supermarkets. The place where meat was purchased was very important to the participants as they felt that there was a definite difference in the quality of meat sold at different retailers. It was also mentioned by some participants that they shop at retailers because it was more convenient as they were able to buy all their groceries at the same time and thus were able to save time. A small portion did not have any trust in butcheries as the handling of the meat seemed not to be hygienic. However, Verbeke (2000:536) found that personal communication through butchers had some potential of reassuring consumers about their concerns. By far the majority of the participants stated that they had more trust in a retailer in connection with the quality and safety of the meat sold with responses such as ... *you can see that it is not clean or maybe the smell was different when compared to a retailer...*

Apart from the above, participants also expressed very strong feelings about the visible appearance of the meat. The visible or physical appearance is part of the extrinsic attributes of lamb when purchasing lamb. This relates to the fact that food products are conceived as a set of attributes by consumers, each of which acts as a cue contributing to the formation of the consumer's impressions of the product itself (Chocarro, Cortiñas & Elorz, 2009:176).

5.2.3 Focus group results

Focus group discussions were held prior to the final composition of the conjoint questionnaire to confirm selected issues, and to allow for the inclusion of new and additional constructs that might have been excluded or overlooked during the literature review (as discussed in Chapter 2). The frequency of the attributes mentioned by the participants during all three of the focus group discussions are listed in Table 5.1.

Table 5.1: Content analysis of attribute mentioned

ATTRIBUTE TESTED	BLACK FOCUS GROUP (Addendum B1)	FIRST WHITE FOCUS GROUP (Addendum B2)	SECOND WHITE FOCUS GROUP (Addendum B3)	TOTAL
Price	27	18	19	64
Traceability	9	8	9	26
Quality	34	17	29	80
Safety	10	10	17	37
Origin	15	29	40	84

From the focus group discussions it was evident that all participants were familiar with lamb/mutton as a meat product, although not everyone was familiar with 'Karoo lamb'. Participants also revealed that they consumed lamb often. This is supported by the purchasing and consumption information in the research. "Traceability" was a difficult notion for some participants and they were not able to define or to describe it. Some participants were able to link it to the origin of the product. Participants perceived the utility of traceability in knowing what they are buying/eating, as having the possibility to have more information about a food product and especially identifying a food product's specific origin, whilst others quoted the utility as the possibility to withdraw or recall a product in case of a problem.

The results from the focus groups confirmed that good quality is one of the important product attributes in the food decision-making process for consumers. Place of origin was used by participants as a quality cue. Where the place of origin is used as an attribute, resources of the region are used to increase the value of the product and can be seen as regional quality. Safety and price were also important attributes that influenced the participants and in the discussion groups they linked it to traceability. Although traceability was perceived by the participants to be related to the recall of products should a food safety crisis occur, it could potentially also be used

to ascertain the level of food safety as well as food quality. Food safety and food quality seem to be two very important elements of the participants' perceptions of food and associated decision making.

The following five product attributes that came to the fore during the three focus group sessions as influencing the decision-making process of consumers when purchasing lamb were identified and used as attributes in the conjoint analysis:

- *Traceability*
- *Quality*
- *Safety*
- *Origin*
- *Price*

The results and the discussion of the results for Phase 3, based on a quantitative approach, and the conjoint analysis findings are presented in the following section.

5.3 Phase 3: Conjoint analysis - results and findings

A product can be evaluated as a bundle of attributes and conjoint analysis as an experimental choice design that determines the combination of the product attributes that consumers most prefer. The results are presented in a series of tables and figures (graphs).

5.3.1 Introduction

A carefully designed conjoint analysis choice design was employed to address two secondary objectives of the study. The first was to determine consumers' evaluation of key attributes that influence their purchasing decision of lamb and the second objective was to determine and describe the different levels of importance of the product attributes that influence the purchasing decision of consumers regarding 'Karoo lamb'. The analysis of the objectives is arranged into two sections and is presented in a specific order. In Section 5.3.3.1 the relative attribute importance as calculated to determine the importance of the attributes of 'Karoo lamb' is dealt with and in section 5.3.3.2 the utility values of the attributes as calculated. In Section 5.3.3.4 the results for the attribute simulation are presented by using the results of Section 5.3.3.1 and

5.3.3.2. These results made it possible to determine the optimum combination of attributes for 'Karoo lamb'.

The consumer sample had the following demographic, geographic and behavioural profile and is discussed below.

5.3.2 Demographic, geographic and behavioural criteria of participants

The respondents of the empirical phase of the study were solicited with the assistance of the marketing research firm, Consulta Research (Pty) Ltd., and were part of a consumer panel of consenting survey participants called ConsultaPanel (www.consultapanel.co.za). All participants were screened electronically by Consulta Research to ensure that they were potential consumers of lamb meat and were at least 18 years old. The age limitation was to ensure that only individuals who influence or are involved in the purchasing of lamb meat were included in the research.

One of the effective factors in food consumption attitudes and purchasing preferences concerns the socio-demographic features of the consumer and the family member (Akpinar, Dagistan, Mazlum & Gul, 2009:2218). Within the scope of this research, the consumers surveyed were classified as represented by gender, marital status, age, educational status, income and employment status. Du Plessis and Rousseau (2003:49) claim that everything affects our consumer behaviour – our culture, our values, the neighbourhoods in which we live, our means of transport, the facilities to which we have access, our education and our media consumption.

A total of 1 011 survey invites were electronically broadcast via ConsultaPanel during October and November 2009. A response rate of 60.1% was achieved as 608 completed surveys were returned before the deadline expired for the survey. After excluding incomplete surveys, 352 surveys were used in the empirical analysis phase of the research.

In Table 5.2 the demographic profile of the consumer sample is listed. Demographic data provide the most assessable and cost-effective way of identifying target markets i.e. the consumers who are involved in decision making regarding the purchase of lamb or mutton.

Table 5.2: Demographic profile of the respondents

Variables	Number of respondents	Percentage of respondents
Gender		
Male	200	57%
Female	152	43%
Marital Status		
Married	242	68.8%
Single	44	12.5%
In a relationship	35	9.9%
Divorced	31	8.8%
Age		
20-30	38	10.8%
31-40	85	24.1%
41-50	88	25%
51-60	91	25.9%
60+	50	14.2%
Ethnic Groups		
White	344	97.7%
Black	5	1.4%
Coloured	2	0.6%
Indian	1	0.3%
Educational Status		
Grade 10-11	7	2%
Grade 12	84	24%
Other post-matric qualification	21	6%
Diploma	88	25%
Higher diploma/degree	91	26%
Honours degree	25	7%
Post-graduate degree	36	10%
Employment Status		
No data	4	1%
Unemployed	4	1%
Student	4	1%
Housewife	11	3%
Working part-time	21	6%
Retired	21	6%
Own business	67	19%
Working full-time	220	63%

Gender: Two hundred of the respondents were male (57%). According to Levy and Weitz (2001:482) many authors are of the opinion that gender roles are changing (i.e. women are no longer solely responsible for the purchasing of household food) and that the sharing of

responsibilities is a characteristic of modern society. The changing of gender roles is partly a result of the increased female participation in the workplace and partly because of the changing role expectations of men as a result of the drive towards equality of the sexes (Cant, *et al.*, 2006:98). Both male and female respondents can therefore be seen as household representatives that are involved in decision making when purchasing lamb.

Marital status: The marital status of the respondents included four groups: married, in a relationship, divorced and single. The results show that the majority of the respondents 68.8%, were married (n = 242). The smallest group (8.8%) of the respondents were divorced (n = 31).

Age: The minimum age for participation in the study was 18 years. Age is one of the most important variables that affect consumer behaviour (Lindquist & Sirgy, 2006:415; Cant, *et al.*, 2006:99). Table 5.2 illustrates that 25.9%, the majority of the participants were between the ages of 51 and 60 years (n = 91). A population can be divided into generations or age cohorts, which are groups of people who experience a common social, political, historic and economic environment. Each generation behaves differently from the preceding one as it passes through the generational categories (Cant, *et al.*, 2006:101). Random selection was used and the sample was recruited based on the respondents' availability and willingness to participate in the study.

Ethnic groups: Common population groups in South Africa are black, white, Indian and coloured. The different groups have different needs, wants, values and behaviour that set them apart from other members of the same society (Du Plessis & Rousseau, 2003:402) and because of these differences they will respond differently to products such as 'Karoo lamb'. An exposition of the respondents in the survey is given in Table 5.2. The majority of the respondents, 97.7%, were part of the white population group.

Educational status: In Table 5.2 the respondents' educational level was divided into seven categories according to years of completed education. Educational level can be used as an indicator of socio-economic status. Better educated people are able to process more information about foods (although they may lack the motivation to do so). According to Wierenga, *et al.* (1997:161), in product evaluation, more highly educated people tend to give more weight to "ethical" criteria such as animal welfare or environmental harm the product could cause and less importance to brand name and country of origin,.

Family lifecycle: Multi-attribute demographic segmentation includes the measurement of constructs such as life cycle or life stage. The life cycle construct suggests that most people pass through the same basic phases of life and have different needs and wants during each of these phases. Just as individual consumers and their buying habits differ from person to person and from situation to situation, each family or household shows similar variations. Several factors influence the ways in which they spend their income. Most important among them are the family lifestyle position. As people find themselves in various positions in the lifecycle such as single, married, married with children, or widowed, their needs change (Lindquist & Sirgy, 2006:476). Life cycle is a composite variable, based explicitly on marital and family status, but includes implicit reference to variables such as age, employment status and disposable income (Cant, *et al.*, 2006:215). Table 5.2 illustrates the stages of the life cycle of the respondents.

Employment Status: The employment status of the respondents was divided into seven categories: unemployed, student, housewife, own business, working full-time, working part-time and retired as seen in Table 5.2. The classification distinguishes positions that imply different employment roles. Steenkamp in Wierenga, *et al.* (1997:162) states that one of the most important demographic influences is the employment status of the wife as it affects all aspects of the decision process through its effects on available time for domestic tasks as well as the size of the family's income.

Income: Discretionary income is the money available to a household over and above that required for a comfortable standard of living (Solomon, *et al.*, 2006:430). In Figure 5.1 the income levels of the respondents are depicted. With rising incomes, consumers tend to switch from more basic products to more luxury or expensive food products (Wierenga, *et al.*, 1997:164). Consumers at different income levels tend to have quite different values, behaviour and lifestyles. Education, occupation and the income of consumers tend to be closely correlated.

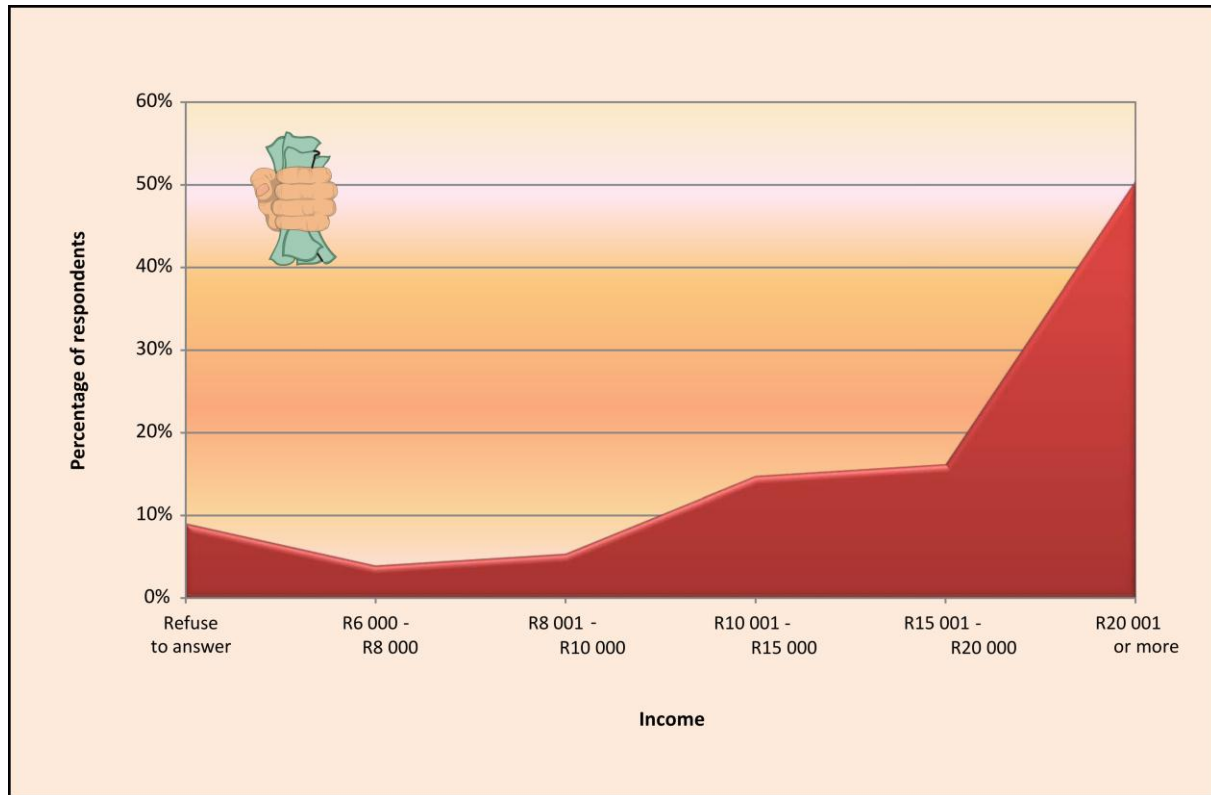


Figure 5.1: Income levels of respondents

Geographical areas: People who live in the same region, suburb or neighbourhood have broadly similar lifestyles, needs and wants and these differ from the needs of people living in other areas. The majority of the respondents, 50%, came from Gauteng that is largely urban and 28% of the respondents resided in the Western Cape. Figure 5.2 shows the different geographical areas where the respondents resided.

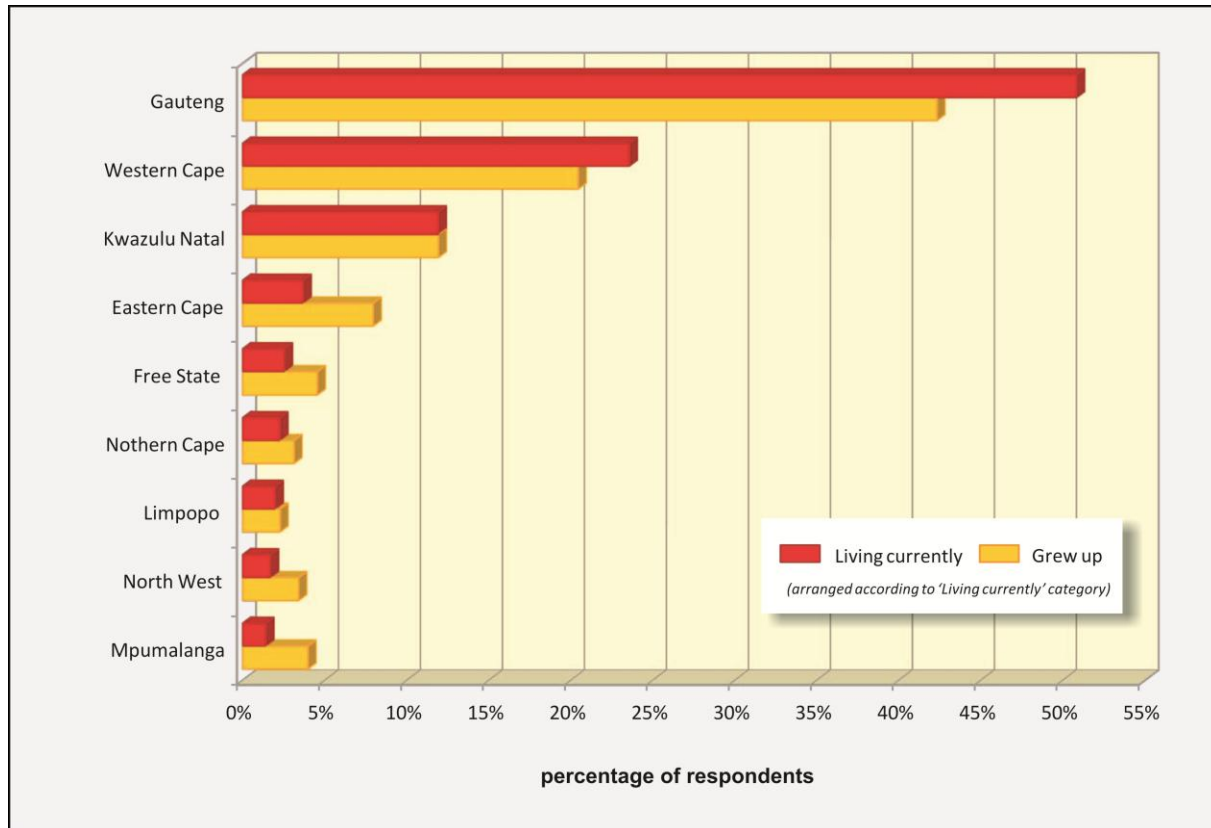


Figure 5.2: Geographical areas of respondents’ places of origin and current residence

The next section discusses the results of the conjoint analysis technique for addressing two objectives of the research.

5.3.3 Conjoint analysis results

The data from the consumer trade-off choice profile presented in the survey were analysed in four basic steps:

- Calculation of the part-worth /utility values for each respondent – this step was output from the Conjoint Value Analysis software used from Sawtooth Technologies and entails the utility estimation of individual attribute level utility values through a process of Ordinary Least Squares (OLS) and zero-centred utility scaling. This data set formed the basis of the analysis of the remaining steps of the research.
- Calculation of the relative attribute importance to determine the importance of attributes in the consumer decision-making process towards ‘Karoo lamb’.
- Calculation of the level of importance of each relevant attribute for the product Karoo lamb.

- Preparation of the attribute simulation tool and product simulations.

The discussion of the results of the conjoint data analysis is arranged in the same sequence as listed in Section 5.3.3 and discussed in consecutive order.

5.3.3.1 Relative and individual attribute importance

In conjoint analysis respondents indicate their preference for a series of hypothetical multi-attribute alternatives, which are typically displayed as profiles of attributes. The responses to these profiles, where different levels of the five attributes, *traceability*, *quality*, *safety*, *origin* and *price*, were combined to produce hypothetical scenarios, were analysed to yield estimates of the relative importance of the attributes. The basic aim, therefore, was to determine the features that consumers most prefer.

Thus the results of the analysis are able to indicate what combinations of attribute levels are ranked highest and the relative importance of each attribute and attribute level, because in real life consumers may find it difficult to indicate which attribute they consider of value and how they combine the attributes to form their overall opinion. If the most preferred product is not feasible for some reason then the conjoint analysis will identify the next most preferred alternative.

In Figure 5.3 the relative importance of each individual attribute is shown graphically, representing the first steps taken when employing the conjoint analysis technique. Attribute importance is the average of all the individual respondents' scores ($n = 352$).

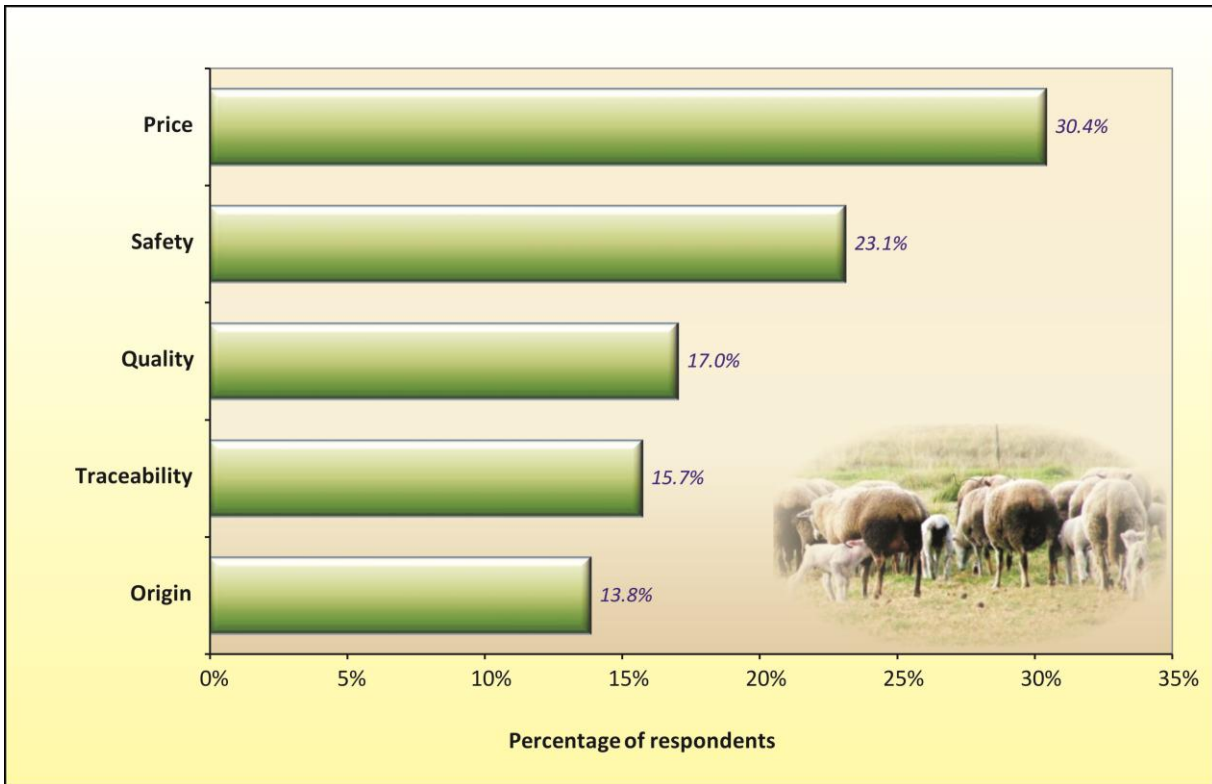


Figure 5.3: Relative importance of each product attribute

A discussion of Figure 5.3 follows:

Price: When the outcomes of the analysis were interpreted, it was found that *price* was the most important attribute in the determination of consumer food choice. The CVA software program creates an index score out of 100 (a percentage) to indicate an attribute’s importance. The results have shown that the relative importance of price in the purchasing decision was 30.4%. Price is often known to be one of the most important and determining factors in the consumer’s decision-making process as reported by several researchers (Iop, Teixeira & Deliza, 2006:898; Brijball, 2003:94). A higher price can sometimes symbolise better quality or safety of the product for consumers. Therefore paying a higher price can be seen as paying for a meat product of better quality (Brijball, 2003:94).

Safety: *Safety* is the second most important attribute after price influencing the purchasing decision at 23.1% as can be seen in Figure 5.3. Consumers have become very critical about food safety due to a number of food scares which have received a great deal of media attention (Raspor, 2008:405; Behrens, Barcellos, Frewer, Nunes, Franco, Destro & Landgraf, 2010:963).

Quality: Third in order of attributes affecting the purchasing decision of ‘Karoo lamb’ was *quality*. The quality attribute affects this decision with 17.0%. A study by Van Rijswijk and Frewer, (2006:2-3) concluded that food safety and quality seem to be very important elements of people’s conceptions of food and associated decision making as can be seen in these results.

Traceability: *Traceability* was ranked fourth as an attribute affecting consumers’ purchasing decision with 15.7% relative importance. Verbeke (2001:254) states that traceability systems guarantee nothing except the ability to track the product throughout the food chain. In a study by Halawany and Giraud (2006) it was found that consumers only perceived traceability as useful in the case of a food crisis. For consumers to rate traceability higher as an attribute a definite link to the safety and quality of the food product should be established through information cues.

Origin: The importance of the fifth attribute of *origin* stood at 13.8%. Contrary to other research studies, the region of origin was not an important factor influencing consumers’ decision making towards lamb meat in South Africa. This observation is in line with the fact that the majority of lamb meat sold on the South African market is marketed and advertised on a commodity basis in that it is distinguished through the red meat grading system and not based on the regional origin of the meat. Van Ittersum, *et al.* (2003) found that the effect of the place of origin on product evaluation is product-specific, such that the place of origin can have a positive influence on the evaluation of one product, but very little or even a negative influence on the evaluation of another.

As shown in Table 5.3 differences between the relative importance of the attributes; *traceability*, *origin* and *quality* were not large.

Table 5.3: Relative importance of product attributes in ranked order

Product attribute	Relative importance (%)
1) Price	30.4%
2) Safety	23.1%
3) Quality	17.0%
4) Traceability	15.7%
5) Origin	13.8%

The next section explains how the relative **utility values of attributes** were determined for the product, 'Karoo lamb'.

5.3.3.2 Relative utility values of attributes

In evaluating products, consumers will always make trade-offs. A consumer may like the quality and safety feature of a particular product like Karoo lamb, but reject the purchase due to the cost. In this case, cost has a high utility value. Utility can be defined as a number which represents the value that consumers place on that particular attribute. In other words, it represents the relative “worth” of the attribute (Hair, *et al.*, 2006a:464). A low utility indicates less value and a high utility indicates more value. The attribute level, which has the highest part-worth, would be the consumer’s most preferred alternative.

The importance of the 27 attribute levels is displayed as a table. Table 5.4 depicts the attributes’ levels of importance across all attributes.

Table 5.4: Attribute level utility values

Attribute	Attribute levels	Attribute relative importance (%)	Attribute level utility value
Price	10% more	30.4	-0.118
	7.5% more		-0.103
	5% more		-0.084
	2.5% more		-0.036
	Same price		-0.033
	2.5% less		0.040
	5% less		0.135
	7.5% less		0.138
	10% less		0.061
Safety	Safety through certification	23.1	0.162
	Safety through labelling/branding		0.063
	Safety through place of purchase		0.144
	Safety not guaranteed		-0.181
	No safety knowledge		-0.188
Quality	Quality through certification	17	0.089
	Quality through labelling/branding		0.049
	Quality through origin		0.054
	Quality not assured		-0.193
Traceability	Trace to animal	15.7	-0.001
	Trace to birth farm		0.075
	Trace to abattoir		0.031
	Trace to processing plant		0.001
	No trace		-0.106
Origin	Origin: Local region	13.8	0.003
	Origin: National (SA) region		-0.052
	Origin: No region		-0.070
	Origin: Specific region (Karoo)		0.118

In conjoint analysis, the difference between attribute levels as much as the part-worth of every attribute level represents the impact of attributes on consumer preferences. In the research the attribute importance and part-worth or weighted utility values of attribute levels were calculated per individual for each attribute. The utility values for each attribute level were determined within an arbitrary additive constant, which means that a utility level from one attribute cannot be compared to the utility level from another attribute (Orme, 2010:78). Therefore, the negative utility values for price have no significant relation when compared to the utility values of the other attributes. Every utility value should therefore be compared within its own attribute.

Table 5.4 indicates that the following attribute levels have the highest weighted raw utility values for each of the attributes:

- *Price 7.5% less* with a utility value of 0.138
- *Safety through certification* with a utility value of 0.162
- *Quality through certification* with a utility value of 0.089
- *Traceability to birth farm* with a utility value of 0.075
- *Origin specific region* with a utility value of 0.118

The attribute level utility values given in Table 5.4 are shown individually for each attribute graphically in Figures 5.4 to 5.8. First in this is Figure 5.4 that depicts the attribute level utility values of importance of *price*.

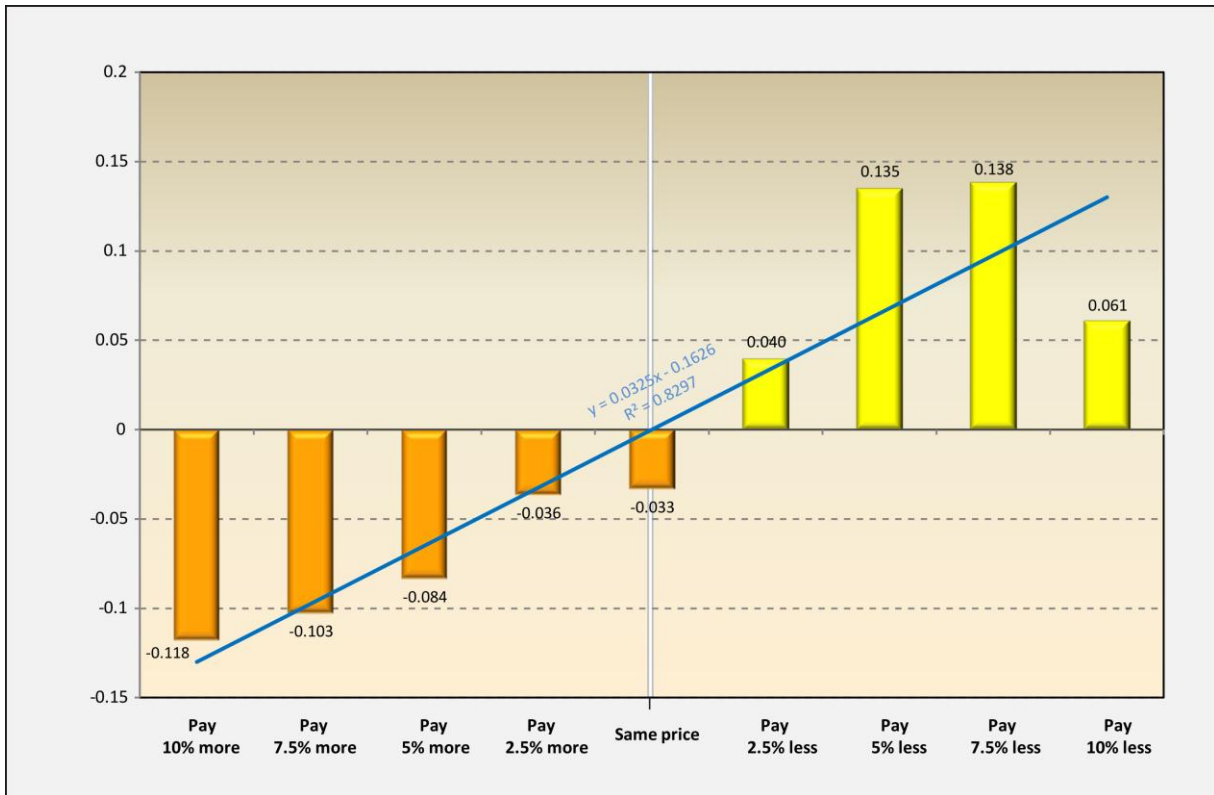


Figure 5.4: Attribute level utility values of price

Figure 5.4 indicates that the respondents gave the following attribute level as having the highest weighted raw utility value for the attribute price.

- **Pay 7.5% less** with 0.138 on the attribute *price*

Figure 5.4 shows that respondents clearly preferred lamb meat at a price level of **7.5% less**, followed closely by the price level **5% less**. The least preferred is the price level **10% more** for the lamb meat with -0.118.

Next Figure 5.5 depicts the attribute level utility values of importance of *safety*.

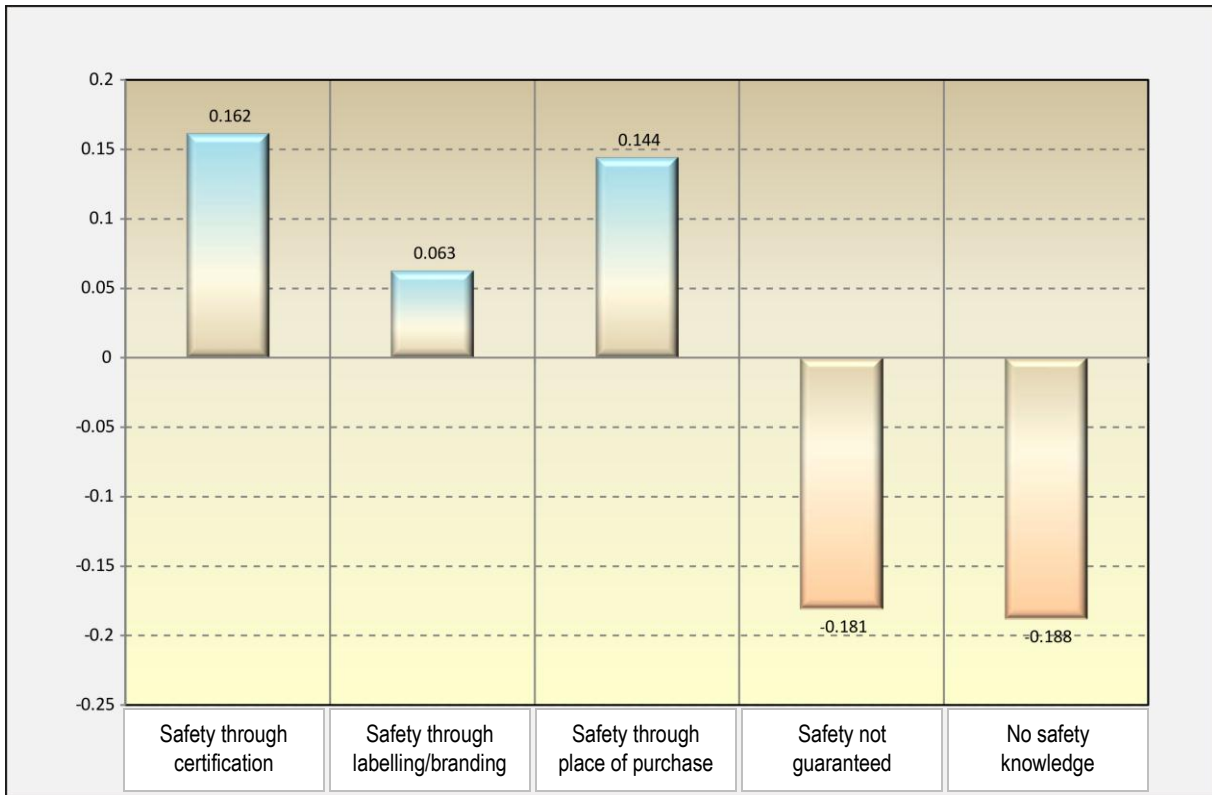


Figure 5.5: Attribute level utility values of safety

Figure 5.5 indicates that the respondents gave the following attribute level as having the highest weighted raw utility value for the attribute safety.

- **Safety through specification** with 0.162 on **Safety**

As can be seen from Figure 5.5 the respondents preferred lamb meat with **safety assured through certification**, followed by **safety through place of purchase** with a utility value of 0.144 and then **safety through labelling/branding** 0.063. The last two levels for safety, **safety not guaranteed** and **no safety knowledge** are both negative and do not vary much.

Next Figure 5.6 depicts the attribute level utility values of importance of *quality*.

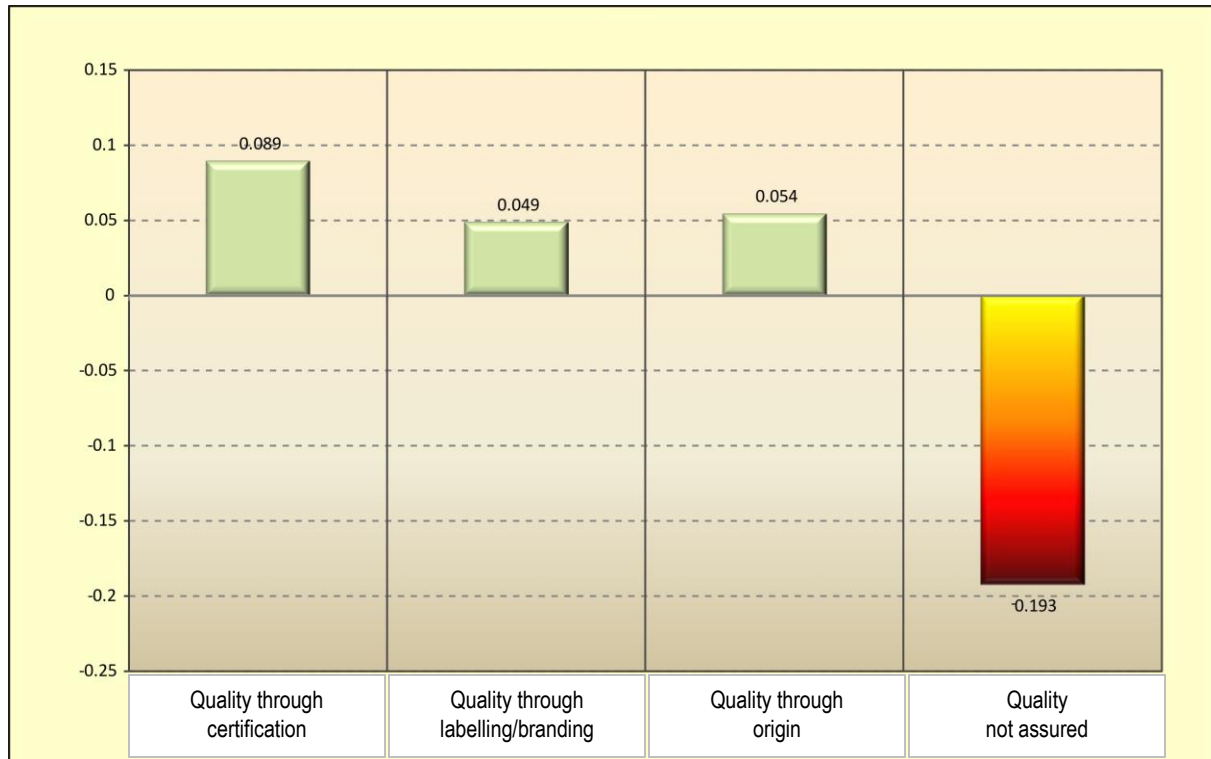


Figure 5.6: Attribute level utility values of quality

Figure 5.6 indicates that the respondents gave the following attribute level as having the highest weighted raw utility value for the attribute quality.

- **Quality through specification** with 0.089 on **Quality**

As can be seen from Figure 5.6 the respondents strongly preferred the lamb meat with **quality assured through certification**, followed by **quality assured through origin** with 0.054. Then followed **quality through labelling/branding** and least preferred is lamb meat with **quality that is not assured**.

Figure 5.7 depicts the attribute level utility values of *traceability*.

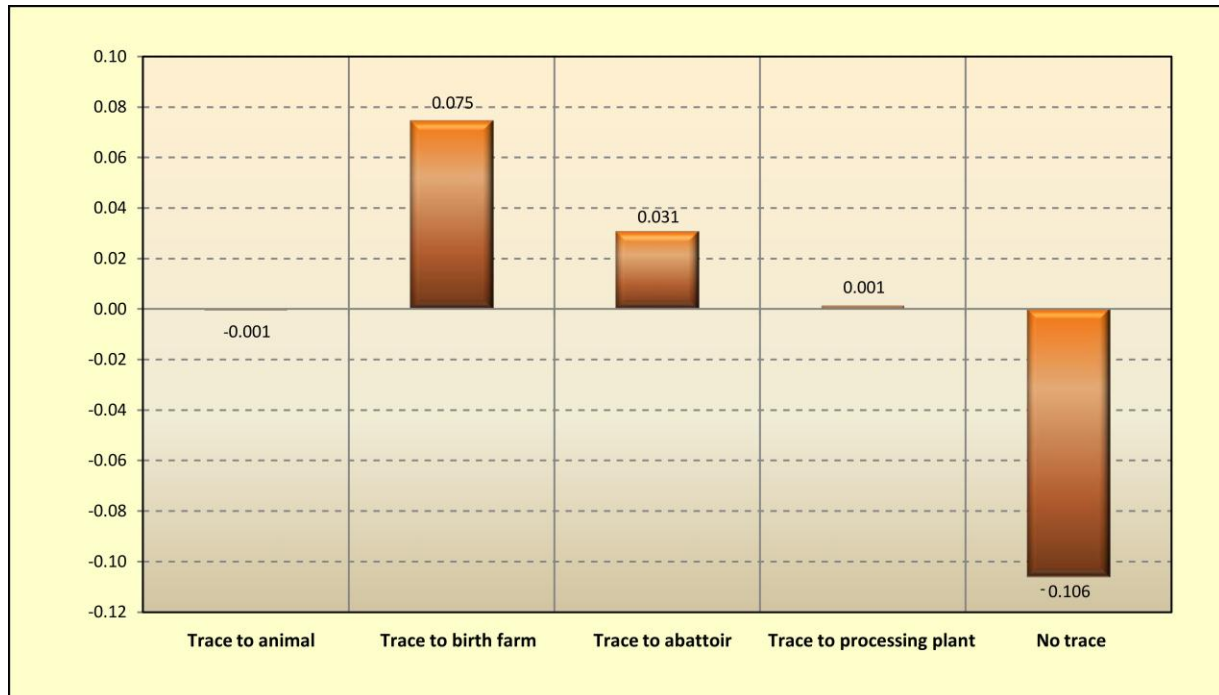


Figure 5.7: Attribute level utility values of traceability

Figure 5.7 indicates that the respondents gave the following attribute level as having the highest weighted raw utility value for the attribute traceability.

- ***Trace to birth farm*** with 0.075 on ***Traceability***

The respondents had the greatest preference for lamb meat that can be ***traced back to the birth farm***. The second most preferred level was lamb meat ***traced back to the abattoir*** and the least preferred was lamb meat that ***cannot be traced***. Traceability to the birth farm, abattoir and processing plant had positive utility levels while traceability to the animal and no traceability had negative utility values.

Next Figure 5.8 depicts the attribute level utility values of importance of *origin*.

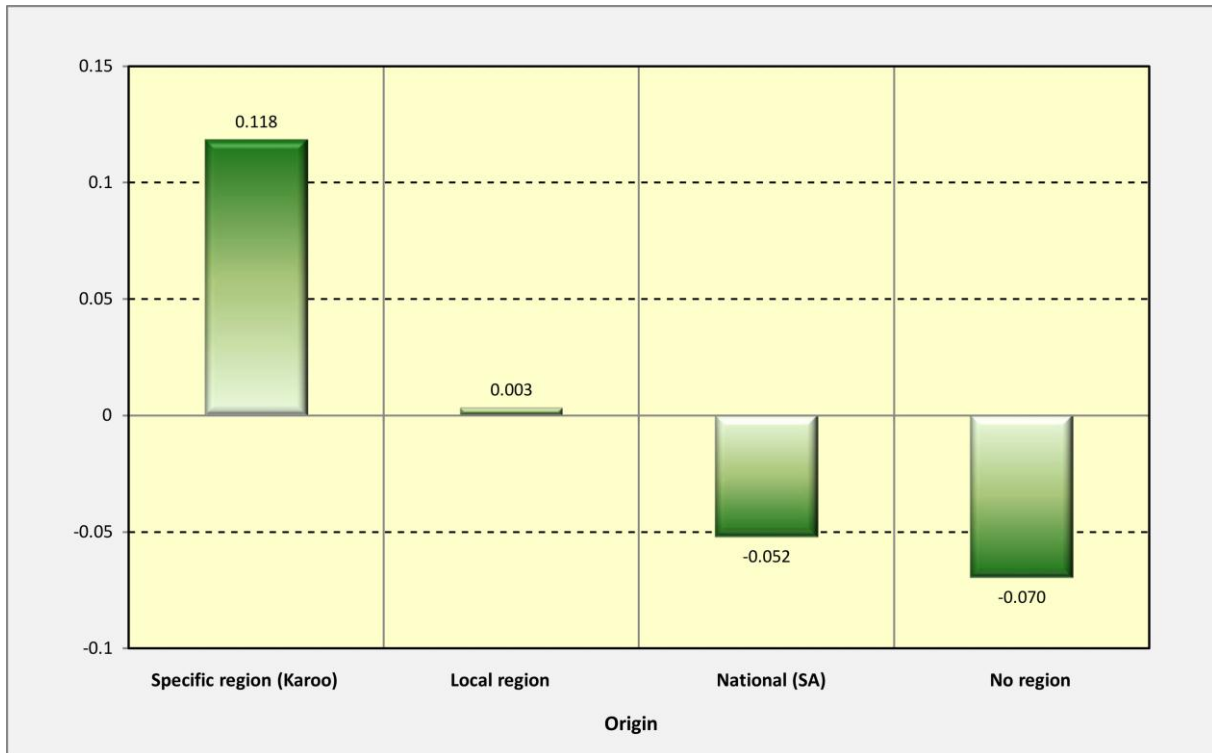


Figure 5.8: Attribute level utility values of origin

Figure 5.8 indicates that the respondents gave the following attribute level as having the highest weighted raw utility value for the attribute origin.

- ***Specific region*** with 0.118 on ***Origin***

As can be seen from Figure 5.8 the respondents have the greatest preference for lamb meat that originates from a ***specific region*** (the Karoo). This is followed by the level ***local region***, then ***national region*** and least preferred is lamb meat with ***no specific region***.

These attribute utility values can be used to make predictions about how respondents will choose between different kinds of lamb meat. The scores are important as they were used as a hard core in the simulation tool for the measurements shown in Tables 5.9 to 5.12.

5.3.3.3 Cross-tabulations of utility sensitivity

Cross tabulation analysis, also known as contingency table analysis is used to analyse categorical (nominal measurement scale) data. In statistical terms cross-tabulated data is a joint distribution between two (or more) discrete variables. It is about taking two variables and

tabulating the results of one variable against the other variable. Cross-tabulation tables provide information about the relationship between the variables.

In this part of the analysis a base case position on the X and Y co-ordinates of the cross tabulation was set to zero (0). The difference (sensitivity) in the utility values of all XY-combinations in the cross tabulation is shown below. With the cross tabulations, attribute level combinations were combined and measured two at a time. The attribute levels with the highest percentage sensitivity showed that consumers will show higher levels of preference for purchasing a product with that particular combination of attributes levels than the base case combination.

In Example 1 a typical cross tabulation table comparing the two hypothetical variables **Traceability** with **Origin** is shown below in Table 5.5.

Table 5.5: Traceability versus origin

	Origin: Local region	Origin: National (SA)	Origin: No region	Origin: Specific region (Karoo)
Trace to birth farm	16.0%	8.4%	6.1%	32.0%
Trace to abattoir	9.8%	2.3%	0.0%	25.9%
Trace to processing plant	5.9%	-1.7%	-4.0%	21.9%
Trace to animal	5.5%	-2.1%	-4.4%	21.5%
No trace	-8.6%	-16.2%	-18.5%	7.4%

The numbers in the table represent the trade-off difference in the utility values, i.e. the difference between the base case (the intersection of the **yellow** columns – where the 0% is) and the cell intercept. There is a 32.0% (highlighted in **blue**) higher level of preference (utility) for **Origin with specific region (Karoo)** that specifies **Trace to birth farm** compared to the base case (which is **Origin with no region and Trace to abattoir – yellow cell value with 0%**).

In Example 2 the cross tabulation table compared the two hypothetical variables **Traceability** with **Quality** as shown below in Table 5.6.

Table 5.6: Traceability versus quality

	Quality through certification	Quality through labelling/branding	Quality through origin	Quality not assured
Trace to animal	1.0%	-3.8%	-3.2%	-31.6%
Trace to birth farm	10.1%	5.3%	5.9%	-22.6%
Trace to abattoir	4.8%	0.0%	0.6%	-27.9%
Trace to processing plant	1.4%	-3.4%	-2.8%	-31.3%
No trace	-11.1%	-15.9%	-15.3%	-43.8%

The numbers in the table represent the trade off difference in the utility values, i.e. the difference between the base case (the intersection of the yellow columns – where the 0% is) and the cell intercept. There is a 10.1% (highlighted in blue) higher level of preference (utility) for **Quality Certification** that specifies **Trace to birth farm** compared to the base case (which is **Quality through labelling/branding** and **Trace to abattoir**- yellow cell value with 0%).

In Example 3 the cross tabulation table compared the two hypothetical variables **Price** with **Traceability** as shown below in Table 5.7.

Table 5.7: Price versus traceability

	Trace to animal	Trace to birth farm	Trace to abattoir	Trace to processing plant	No trace
10% more	3.4%	15.6%	8.5%	3.9%	-12.9%
7.5% more	5.0%	17.1%	10.0%	5.5%	-11.3%
5% more	8.0%	20.2%	13.1%	8.5%	-8.2%
2.5% more	15.5%	27.6%	20.5%	15.9%	-0.8%
Same price	16.3%	28.4%	21.3%	16.7%	0.0%
2.5% less	27.2%	39.4%	32.3%	27.7%	10.9%
5% less	-38.8%	-26.7%	32.3%	-38.4%	-55.1%
7.5% less	-39.4%	-27.2%	-34.3%	-38.9%	-55.7%
10% less	-39.3%	-27.2%	-34.3%	-38.8%	-55.6%

The numbers in the table represent the trade-off difference in the utility values, i.e. the difference between the base case (the intersection of the yellow columns – where the 0% is) and the cell intercept. There is a 39.4% (highlighted in blue) higher level of preference (utility) for **Trace to**

birth farm that specifies **Price 2.5% less** compared to the base case (which is **No traceability** and **Same price** – yellow cell value with 0%).

In Example 4 the cross tabulation table compared the two hypothetical variables **Traceability** with **Safety** as shown below in Table 5.8.

Table 5.8: Traceability versus safety

	Safety through certification	Safety through labelling/branding	Safety through place of purchase	Safety not guaranteed	No safety knowledge
Trace to animal	94.0%	72.7%	89.9%	22.5%	21.5%
Trace to birth farm	110.1%	88.7%	105.9%	38.5%	37.5%
Trace to abattoir	100.7%	79.4%	96.6%	29.2%	28.1%
Trace to processing plant	94.7%	73.3%	90.6%	23.1%	22.1%
No trace	72.6%	51.3%	68.5%	1.0%	0.0%

The numbers in the table represent the trade-off difference in the utility values, i.e. the difference between the base case (the intersection of the yellow columns – where the 0% is) and the cell intercept. There is a 110.1% (highlighted in blue) higher level of preference (utility) for **Safety through Certification** that specifies **Trace to birth farm** compared to the base case (which is **No safety knowledge** and **No trace**- yellow cell value with 0%). The cross tabulation has given a basic picture of how the two variables were interrelated.

In addition to providing information on the importance of product features, conjoint analysis provides the opportunity to conduct computer choice simulations. This function is one of the main reasons why conjoint analysis was used. Simulation is the final stage in the conjoint analysis process.

5.3.3.4 Conjoint simulation analysis for Karoo lamb attributes

Simulation analysis models are used to estimate choice share (a surrogate for market share) based on respondent preferences for different “simulated products” each of which is defined by specifying a select set of attribute levels. Analysing only average preferences (part worth utilities) can mask important market forces caused by patterns of preference at the segment of

individual level. The simulation tool enabled the researcher to simulate anything and therefore indicated where a retailer should focus its marketing, although this was based on assumptions only.

The simulator is used to convert raw conjoint (part-worth utility) data into something more managerially useful: simulated market choices. Products can be introduced within a simulated market scenario and the simulator reports the per cent of respondents projected to choose each. Simulators simply use a rule for tabulating votes for the product concepts being tested in the simulator. The objective of the simulator is to create a “market environment” that tests preferences between options being tested. Knowing how important or valuable each profile is can be useful when wanting to know the best combination. The results of market simulators are easy to interpret because they are scaled from zero to one hundred. Unlike part-worth utilities, simulation results (shares of preference) are assumed to have ratio scale properties – it is legitimate to claim that a 40% share of preference is twice as much as a 20% share. Sensitivity analysis using market simulation offers a way to report preference scores for each level of each product attribute.

The sensitivity analysis approach can show us how much we can improve or worsen a product’s overall preference by changing its attribute level one at a time, while holding all other attributes constant at base case levels. The market simulation is run repeatedly to capture the incremental effect of each attribute level upon product choice. After all the levels within a given attribute have been tested that attribute is returned to its base case level prior to testing another attribute. The results of the attribute’s level of importance (see Table 5.4) were used as input into the attribute simulation tool.

With the simulation tool the researcher was able to test alternative product scenarios as illustrated in Tables 5.9 to 5.12. Various simulations can be run by changing the levels to find the optimum importance and preference of each profile.

Table 5.9 illustrates two simulations based on assumptions made specifically for ‘Karoo lamb’.

Table 5.9: Attribute simulation tool for Karoo lamb – example one

Base Case	Simulation 1	Simulation 2
No trace	Trace to birth farm	Trace to birth farm
Origin: No region	Origin specific region Karoo	Origin local region
Quality not assured	Quality through origin	Quality not assured
No safety knowledge	No safety knowledge	Safety through place of purchase
Same price	Same price	Same price
	82.4%	81.8%

Table 5.9 indicates that the profile preference obtained from Simulation 1 is marginally higher than that of Simulation 2. Two attribute levels, namely **trace to birth farm** and **same price** were similar in both simulations.

One can now change the levels for a specific attribute category and see the potential impact of the change. The price attribute level is changed in Simulation 3 from **same price** to **price 5% more**. Table 5.10 illustrates the effect of change on the simulation (n = 352) and indicates that consumers are extremely price sensitive. It needs to be noted that, in comparison to the base case (same price), there is a significant higher preference for 'Karoo Lamb' even at the 5% higher price (indicating the willingness to pay a premium for Karoo branded lamb meat).

Table 5.10: Attribute simulation tool for Karoo lamb – example two

Base Case	Simulation 3	Simulation 4
No trace	Trace to birth farm	Trace to birth farm
Origin: No region	Origin specific region Karoo	Origin specific region Karoo
Quality not assured	Quality not assured	Quality not assured
No safety knowledge	Safety through place of purchase	Safety through place of purchase
Same price	Price 5% more	Same price
	80.1%	86.1%

As seen in Table 5.10 the preference for Simulation 3 is lower than that of Simulation 4. The tool therefore indicates that the product Karoo lamb as simulated in Simulation 4 is valued higher (86.1%) than the product in Simulation 3 and has gained a higher preference rating

among the participants. The simulation thus gives a strategic direction regarding the level of the attribute price that should be offered for Karoo lamb.

Table 5.11 gives a further indication about the willingness to pay of consumers for the product Karoo lamb. Only one attribute level, namely price, was changed in all three simulations. The best scenario, by comparing the three different simulations, is Simulation 9 with a profile score of 56.5%.

Table 5.11: Attribute simulation tool for Karoo lamb – example three

Base Case	Simulation 5	Simulation 6	Simulation 7
No trace	Trace to birth farm	Trace to birth farm	Trace to birth farm
Origin no region	Origin local region	Origin local region	Origin local region
Quality not assured	Quality not assured	Quality not assured	Quality not assured
No safety knowledge	No safety knowledge	No safety knowledge	No safety knowledge
Same price	Price 7.5 % more	Price 5% more	Price 2.5% more
	48.3%	50.0%	56.5%

Various simulations can be run by changing the levels to find the optimum importance and preference of each profile.

To illustrate the tool further, changes were made to the attribute levels *origin*, **quality**, **safety** and price of the product Karoo lamb. Table 5.12 of the simulation indicates the following results for the specific profiles.

Table 5.12: Attribute simulation tool for Karoo lamb- example four

Base Case	Simulation 8	Simulation 9
No trace	No trace	No trace
Origin: No region	Origin: No region	Origin specific region Karoo
Quality not assured	Quality through labelling/branding	Quality through certification
No safety knowledge	Safety through labelling/branding	Safety through certification
Same price	Price 5% more	Same price
	69.0%	85.8%

Table 5.12 indicates that Simulation 8 has a preference score of 69% compared to the base case, whilst Simulation 9 has a much higher preference by comparison (85.8%). The change to the attribute **origin no region**, **quality through labelling/branding** and **safety through labelling/branding** combined with a **price of 5% more** is therefore not preferred or more

important than having **origin specific region Karoo**, **quality through certification** and **safety through certification** combined with the **same price**.

Figure 5.9 provides a summary of the best scenario (highest preference scores) and the worst scenario (lowest preference scores), in this case by offering Karoo lamb with the following attribute levels:

- **Trace to birth farm** (the attribute Traceability), **origin specific region Karoo** (the attribute Origin) and **safety place of purchase** (the attribute Safety) had the highest individual value of 86.1%
- **Safety through certification** (the attribute Safety), **quality through certification** (the attribute Quality) and **origin specific region Karoo** (the attribute Origin) had the second highest individual value of 85.8%
- **Trace to birth farm** (the attribute Traceability), **origin local region** (the attribute Origin) and **7.5% more** (the attribute Price) have had the lowest individual value of 48.35%
- **Trace to birth farm** (the attribute Traceability), **origin local region** (the attribute Origin) and **5% more** (the attribute Price) have had the second lowest value of 50.0%

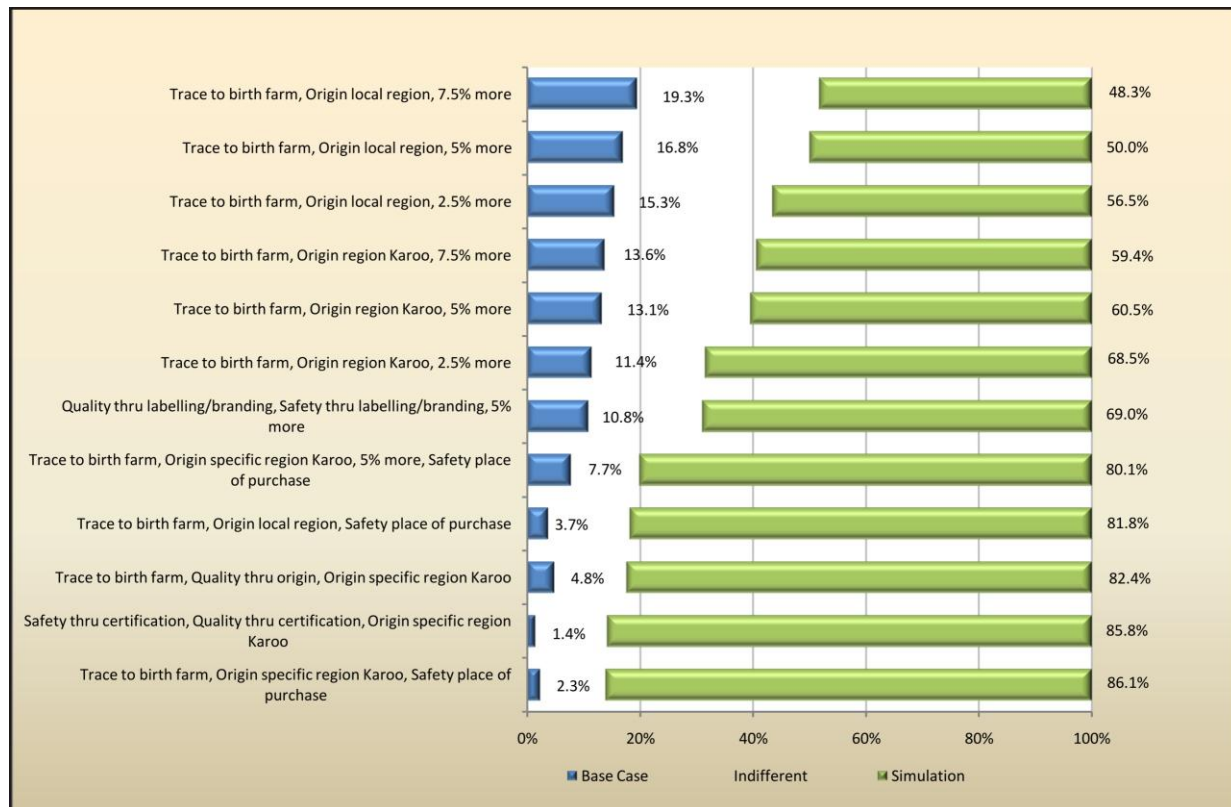


Figure 5.9: Attribute simulation

The results of the attribute simulation in Figure 5.9 illustrated what profile or profiles would be most preferred by consumers. From the above it is seen that consumers clearly indicated that they are willing to pay a price premium of 5% more (attribute **price**) for Karoo lamb with the attributes *trace to birth farm*, *origin specific region Karoo* and *safety through place of purchase*. *Price* is once again seen as an important attribute with respondents indicating that the price of 'Karoo lamb' should definitely not be increased too much.

5.4 Summary

The attraction of using conjoint analysis is that it asks the respondents to make choices between products defined by a unique set of product attributes in a way they normally do – by trading off features, one against the other. The theory and methods of conjoint analysis deal with complex decision making that involves the process of assessment, comparison and/or evaluation.

The objective of determining the attributes and attribute combinations that play a role in the decision-making process of consumers when purchasing lamb meat, were achieved. The most important attribute for the respondents, according to the importance values, is price, followed by safety, quality, traceability and origin. Price is often shown to be one of the more important and determining factors in consumer decision making and is defined differently and individually for every person who engages in it. If a consumer has a certain budget this would be something that would limit or influence the evaluation of different fresh meat alternatives. Consumers base a choice of purchase on how much the fresh meat is worth and in what type of situation it will be used. The conjoint analysis revealed that the largest percentage of the respondents prefer lamb meat that is traceable back to the birth farm, originates from a specific region, namely the Karoo, and prefer the quality and safety to be guaranteed through certification.

In Chapter 6 the research findings from Phases 2 and 3 are integrated and interpreted more comprehensively. It concludes with the final recommendations, comments on the limitations of the study and recommendations for future research.

CHAPTER 6

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter entails the presentation of the conclusions based on the quantitative and qualitative data findings of the research. The primary method of data collection was through the electronic application of conjoint analysis. However, to gain background information for structuring the conjoint questionnaire, three focus group sessions were held and semi-structured interviews were conducted with role players in the red meat industry. The analysis of the data and interpretation of the results were done in line with the stipulated objectives.

The overall goal of the research was to explore the role and contribution of a traceability system by linking product, in this case, 'Karoo lamb', producer and place of production. In consequence, the influence of traceability on consumers' decision-making processes when selecting and purchasing 'Karoo lamb' while buying lamb meat, came to light. During the research process a large amount of information was gathered. This gave the necessary insight for meaningful discussion and interpretation of the results to meet the various objectives set for the research. Decisive conclusions were also reached.

The main findings of the study are summarised (Section 6.2). After which the proposition outcomes are stated (Section 6.3) and the study is evaluated in terms of the quality of the results (Section 6.4.1). The limitations of the conjoint analysis (Section 6.4.2) are put forward and an overall evaluation of the study is given (Section 6.5). The last three sections offer recommendations based on the research findings (Section 6.5), suggestions for further research (Section 6.6) and concluding notes (Section 6.7).

6.2 Summary of main findings

In addressing the research goal the research methodology involved the use of a number of techniques that were implemented in three phases:

Phase 1 - **Auditing** - secondary data (through observation and interviewing)

Phase 2 - **Focus groups** – secondary data (identifying lamb attributes)

Phase 3 - **Conjoint analysis** – primary data

6.2.1 Phase 1: Auditing

Consumers can easily be misled as to the true origin of the lamb and mutton being sold as 'Karoo lamb', and only through official audit processes can the origin of the lamb be verified and guaranteed.

The objective to investigate and describe the existing audit processes in place for the traceability of products of origin, with a specific focus on 'Karoo lamb', was achieved through the use of interviews in an experience survey and the researcher participating as observer in four audits in the red meat industry.

South Africa has its own audit processes in place in the red meat industry that differ from international audit processes. All the major retailers have their own standards and guidelines, as well as different traceability processes, which are regularly audited by the retailer or their representative auditing company.

As part of the auditing results it was found that the greatest risk to traceability is identity retention. Animals are usually identified by printed ear tags, branding, tattoos or RFIDs (radio frequency identification devices) which can be imbedded in ear tags or implanted under the skin. At the abattoir, immediately post-slaughter, the head, skin and viscera are removed from the carcass, thereby removing any physical identification cues from the meat. Therefore carcasses must be re-identified using barcodes and/or hardware for each carcass as it moves through the abattoir. The original mark and the abattoir identification must be linked to maintain a tracking chain associated with traceability. However, during processing the carcass is dismantled into primal cuts or as pre-packaged individual cuts. As the procedure is usually non-linear, meat from different animals is likely to become jumbled up while being processed and packaged. During the abattoir audit the researcher observed that the greatest difficulty in keeping the traceability process in one piece was here at this stage, hence the possibility arises that the integrity of the process could be jeopardised at this point. Full traceability demands that a label or identifier relating to the original carcass must be attached to each individual piece of meat and remain with it all the time. This would be the most important factor in assuring the validity of the data provided about the final meat product.

The conclusion drawn is that it can be safely said that traceability systems for red meat products are fully operational in South Africa but, since no retailer currently sells lamb clearly labelled or marked 'originating from the Karoo', no traceability systems in the supply chain are operational for the product, 'Karoo lamb'.

The investigation into the current regulations and legislation in South Africa regarding traceability and traceability systems for the red meat industry was discussed in Chapter 4. Many regulations relating to the production, marketing and labelling of food products are in place to protect the South African consumer. The most important law concerning red meat is the Meat Safety Act, 2000 (Act 40 of 2000) that addresses measures to promote the safety of meat and animal products, and to establish and maintain essential national standards in respect of abattoirs. Moreover, an international standard by the International Organisation for Standardisation, (ISO 19011) has been adopted as a South African national standard (SANS 19011) to guide the quality of meat and environmental systems and to provide guidelines for conducting audits.

In addressing the objective as to whether retailers have implemented traceability systems for 'Karoo lamb' or not, it was established that during the period 2009-2010 no retailer in South Africa sold lamb that was labelled and certified that it originated from the Karoo. The various retailers used different indicators to distinguish their lamb meat from others (Free Range, Certified Natural Lamb, Just Lamb and Country Reared). If necessary, the lamb could be traced back, but only through batch traceability. From the documented information, the lamb could be traced back using its sell-by-date to the group of farmers who had delivered the lamb to the abattoir on a specific day. The sell-by-date is thus taken as the traceability code.

It was thus found that traceability systems for red meat were implemented in all four industry sectors, the farm, abattoir, processing plant and the retail industry but no complete traceability system for 'Karoo lamb' is operational as retailers do not sell lamb meat labelled and certified as originating from the Karoo region in South Africa.

In determining the need for and role of traceability in the supply chain management process of Karoo lamb and its advantages, disadvantages and benefits, it was found that traceability has to cover all steps of production from 'farm to fork' and be built as a continuous chain to be effective and to create value. Every stage needs to be monitored to ensure the

maximum degree of traceability, and this will only be successful if the whole process is transparent. The main benefits of traceability are food safety and preservation of the authenticity of the food product involved. Without traceability systems in place a consumer cannot be certain of the origin of the lamb/mutton and can easily be misled.

From this discussion it can be concluded that auditing can be used as an effective tool for the authentication of products of origin through traceability systems, yet it does not seem to be used for the purpose of continual improvement of the present traceability systems operational for red meat in the supply chain. It was found that the results of audits are mainly used as opportunities for corrective action to solve the problems identified during the audits, but not as long-term plans to improve and simplify the traceability systems in the red meat industry.

6.2.2 Phase 2: Focus Groups

A qualitative method of research, the use of focus groups, was considered most appropriate for the objective **to determine the key attributes that influence consumers' purchasing decisions of mutton/lamb.**

Through conducting three focus groups sessions it was noted that the concept of traceability was understood by the majority of participants as the place where the lamb/sheep originates. The majority had no prior knowledge about how a retailer in South Africa is able to trace meat back to its origin, either the farm or the abattoir, if this was necessary, and they even questioned the value of such a process. In accord with previously done research, it was found that participants felt that retailers benefited more from traceability systems than anyone else, as it enabled them to solve a complaint more easily. Traceability can, however, give consumers confidence about the quality of the meat because of perceived product safety. The findings of the research proved that this is so.

Furthermore, findings indicated that perceived quality influenced purchasing behaviour with some participants being willing to pay a premium for perceived quality and safety i.e. lamb certified as coming from the Karoo. They stated a preference for lamb/mutton that is guaranteed as originally coming from the Karoo as, according to them, Karoo meat has a better and different taste because the sheep graze on indigenous Karoo shrubs. If the origin of the lamb is guaranteed through certification or labelling it would add value to the product. Local meat was

also perceived as safer because the origin was known and preferred to imported meat. Only a small group regarded origin as unimportant and useful for advertising purposes only.

It was noted that the attribute *price* was perceived as very important in influencing purchasing behaviour and that the majority of consumers will buy 'cheaper' meat, whatever the origin. This finding indicated consumers' price sensitivity. Only a few participants said that they would be willing to pay a higher price for perceived quality and safety. This finding has shown that other attributes, apart from price, can also be important to consumers.

The content of the comments from the focus group participants largely supported and confirmed the theoretical content of the literature overview in Chapter 2. Constructs pertaining to *safety and safety issues* and *perceived quality* were frequently mentioned and discussed during the sessions, and were therefore accommodated in the questionnaire so that the relevance of these attributes could be quantified.

The results of the focus group activities found that **the following attributes contributed to consumers' decision making when purchasing lamb: *price, safety, quality, origin* and *traceability*.**

6.2.3 Phase 3: Conjoint Analysis

Conjoint analysis was used as method to determine the relative importance of each attribute, attribute levels and combinations of the attributes of 'Karoo lamb'. **The research results achieved the objective of determining the attributes and attribute combination that influenced consumers' decision-making process when purchasing 'Karoo lamb'.** The analysis allowed for identifying product attributes that created most value for consumers and how consumers were likely to react to different product configurations. Value for a consumer is created by any product attribute that motivates consumers to buy products that take them closer to achieving their personal goals.

According to Table 5.4 the results indicated that **price was determined as the most important attribute** with a score of 30.4%. Price is very often shown in research to be one of the most important and determining factors in consumers' decision making. In the consumer behaviour model offered by Steenkamp in Wierenga, *et al.* (1997) with respect to food (Figure 2.4), price is

part of the environmental factors and, more specifically, the economic variables. During the information search stage of the decision-making process consumers evaluate price by putting the price in relation to how much the lamb/mutton is considered to be worth. The results from both the conjoint analysis and the focus groups confirmed that price was the most influential attribute in consumers' purchasing behaviour.

The results of the analysis indicated what combinations of attribute levels were ranked highest and the relative importance of each attribute and attribute level. **Safety** is the second most important attribute after **price** and it was found effective in the purchasing decision at 23.1%. The third attribute affecting purchasing decision was **quality**. Quality as an attribute affects this decision at 17.0%. The fourth attribute of **traceability** is recognised as affecting the purchasing decision of the respondents by 15.7% and the importance of the fifth attribute of **origin** was found to be 13.8%.

In evaluating products, consumers will always make trade-offs, where a consumer may prefer the quality and safety feature of a particular product like 'Karoo lamb', but reject the purchase due to its cost. In this case, cost has a high utility value. **The following attribute levels, as summarised in Table 6.1, had the highest weighted raw utility values for the product 'Karoo lamb':** for the attribute *traceability* traced back to the birth farm was preferred; for the attribute *origin*, specific region as the Karoo was preferred; for the attribute *quality*, quality through certification was preferred; for the attribute *safety*, safety through certification was preferred; and for the attribute *price* the price level of less than **7.5%** was preferred.

Table 6.1: Karoo lamb scenario summarised

Attributes	Attribute levels
a) Traceability	Trace to birth farm
b) Origin	Specific region (Karoo)
c) Quality	Through certification
d) Safety	Through certification
e) Price	7.5% less

Using conjoint analysis provides the opportunity to conduct computer choice simulations where the simulator is used to convert raw conjoint (part-worth utility) data into something much more useful for management purposes: simulated market choices. Figure 5.19 illustrated the best scenario (highest individual scores) and the worst scenario (lowest individual scores), by offering Karoo lamb with the following attribute levels:

- *Trace to birth farm* (the attribute traceability), *origin specific region Karoo* (the attribute origin) and *safety place of purchase* (the attribute safety) had the highest individual scores of 86.1%
- *Safety through certification* (the attribute safety), *quality through certification* (the attribute quality) and *origin specific region Karoo* (the attribute origin) had the second highest individual score of 85.8%

In determining the contribution of traceability in the labelling or branding of Karoo lamb, the results indicated that the differentiation potential of traceability *per se* is quite limited. Instead traceability is needed as the regulatory and logistic backbone for providing guarantees related to the origin and quality, as consumers can easily be deceived or misinformed about the true origin of the lamb meat. Traceability labelling provides assurance for the consumer regarding the tracing back to the origin of the lamb meat.

The next section will discuss the outcomes of the research propositions.

6.3 Proposition outcomes

Although research on traceability and lamb meat exists, it became evident that research had not yet been done on investigating the link between the lamb, the producer and the place of origin of the lamb (Karoo region) through traceability, nor on determining the attributes, and their importance for consumers in their decision making when purchasing lamb meat from the Karoo region. Therefore the following propositions were formulated:

P1: *A link between the product (lamb), the producer and place of origin (Karoo region) with reference to traceability exists and is relevant to consumers who purchase lamb meat.*

This proposition was supported by the findings that related to the auditing of the traceability processes. As determined by the auditing of the supply chain, it was established that a link between the product (lamb), the producer of the lamb and the place of origin (Karoo lamb) does exist. Traceability processes were put in place by the retailers to secure the link. The main findings of the conjoint analysis, however, showed that the link was not perceived as very relevant for the consumers in their decision making as the origin of the lamb was not rated highly as an attribute.

P2: *Different product attributes and combinations of attributions influence consumers' decision making when purchasing lamb.*

The second proposition was supported by the quantitative findings that determined what attributes and combinations of attributes influenced the decision making of consumers the most when they were purchasing lamb. In evaluating products, consumers will always make trade-offs. Price has already been noted as being the most important and determining factor in the consumers' decision-making process (Section 6.2.2), followed by safety and then quality. Origin and traceability were not as influential but still played a significant role in deciding the overall preference of what type of lamb meat to purchase.

P3: *Different levels of importance are attached to the different product attributes by consumers in their decision-making process when purchasing lamb.*

The third proposition was also supported by the quantitative findings of the research that indicated that there are different levels of importance attached to the different product attributes. The importance of the 19 attribute levels is displayed in Table 5.4 and it is important to interpret the weighted raw utility values only within each attribute level, for example, the *price* with the price levels.

6.4 Evaluation of the study

The quality of the results is discussed in terms of their validity and reliability to substantiate that the measurements used did measure the concepts applicable to the research accurately, and were as free from error and bias as was humanly possible, hence the consistency factor of the results is commendable.

6.4.1 Quality of the results

The quality of the data determines whether the research is successful and publishable or not, as well as whether or not significant statistical results can be achieved and hence meaningful conclusions obtained (Leedy & Ormond, 2010:28). The value and applicability of the results of the research depend on the validity and reliability of the respective data collection methods. The researcher purposefully aimed to provide data that was valid and reliable.

The quality of the data was attended to through the elimination of potential errors in the following ways:

6.4.1.1 Validity

The validity of a measurement instrument is the extent to which the instrument measures what it is actually intended to measure (Leedy & Ormrod, 2010:92). Validity takes different forms, each of which is important in different situations. The following precautions were taken in order to ensure valid results:

Content validity

According to Babbie (2010:155), content validity refers to how much a measure covers the range of meanings included within a concept. Content validity was ensured through thorough scrutiny of relevant literature to gain an understanding of the relevant terminology and concepts for the research, particularly in terms of their application to conjoint analysis. Relevant literature was also reviewed to become acquainted with established theories that have been applied in similar research – such as the consumer decision-making model within the scope of consumer behaviour theory (Schiffman & Kanuk, 2007), and the consumer behaviour model with respect to food designed by Steenkamp in Wieranga, *et al.* (1997). The central concepts for the research were explicated in terms of theoretical definitions obtained in the literature. The validity of the data was improved by using both original and recently updated sources, and by comparing these to each other in order to understand the problem or theory more deeply.

For the data to be valid the researcher decided to use only one of the official languages of South Africa, English, in her interaction with the respondents of the questionnaire, in interviews conducted and with focus group participants, to avoid cultural and verbal misunderstandings. This also avoided poor respondent performance and the possibility of a lack of understanding of the aim or the content of the research.

To support content and measurement validity in the research, the conjoint questionnaires were constructed and evaluated under the guidance and support of the marketing research company Consulta Research (Pty) Ltd. The questionnaire was also pilot-tested to ensure content and measurement validity. So that the respondents would not be affected by factors other than the

five attributes, all the electronic profile cards were constructed in a similar way. The font size and style was also the same on all the electronic profile cards to avoid mental manipulation, i.e. if one of the factors looked bolder biased results could have arisen.

Face validity

Face validity is a desirable characteristic of a measuring instrument as without it resistance on the part of the respondents might be encountered. This would, in turn, adversely affect the results obtained (De Vos, *et al.*, 2003:167). It was therefore important to structure the questionnaire so that it not only accurately measured the attributes under consideration, but also appeared to be a relevant measure of those attributes. To accomplish this, a link was established between each question in the questionnaire and the objectives of the research. To ensure that this happened, the objectives of the research were used in an appropriate and understandable manner to construct the questionnaire for Phase 3.

Representative sample

According to Babbie (2010:197), the participants selected from the target population must be representative of the target population in order to obtain an unbiased sample. The participants in Phase 2 and Phase 3 of the research were randomly chosen which helped the research overcome the problem of biased results, as suggested by Gorard (2003). Using a random-selection method also served as a check on the researcher's conscious or unconscious bias.

Sampling error vs. Measurement error

Errors can be explained as being deviations from the 'truth'. Sampling errors occur when samples of respondents deviate from the underlying population. If a random sample was drawn, any sampling error was due to chance. With random samples, sampling error can be reduced by simply increasing the sample size.

A second source of error in conjoint data is measurement error. Measurement errors can be reduced by having more and/or better data from each respondent. This can be done by including more questions in the conjoint questionnaire. In traditional conjoint analysis (CVA) the

minimum sample size is one. Sufficient questions should be asked to obtain three times the number of observations as parameters to be estimated or a number equal to:

$$3(N-n + 1)$$

where

N = total number of levels

n = total number of attributes

However, in answering a questionnaire, respondents get tired and there is a limit beyond which they can no longer give reliable responses. Therefore there is a limit to the extent we can reduce measurement error.

Measurement validity

The validity of the measurements was determined by using standard yardsticks including content and construct validity as suggested by Babbie (2010:153-154). The content and construction of the conjoint experiment related to the objectives and sub-objectives of the research, thus contributing to its content validity.

Conjoint analysis was deemed appropriate to use in this research since this type of method has demonstrated potential to predict individual respondents' perceptions of a product well. According to Green and Srinivasan (1990), this technique gives the research that uses it, a significant level of validity. To ensure that only important and relevant attributes were included in the questionnaire, three focus group sessions were conducted to determine the attributes to be used.

A possible threat to validity when doing research is a problem that might arise due to the diffusion of ideas among the respondents. Since the respondents were questioned in their own setting that was familiar to them, and the technique was used in exactly the same way in each of the sessions, the validity of the research was enhanced.

Construct validity

Construct validity refers to the relationship between the variables in the study and the logic of the relationships (Babbie, 2010:154). Since the conceptualisation of this research was

supported by evidence from the literature reviewed on the topic, and existing theoretical models were used with terminology appropriately defined, the validity of research procedure and its implementation are deemed to be valid.

6.4.1.2 Reliability

The key criterion for validity in data collection is reliability (Mouton, 1996:144). Reliability can be described as the accuracy or precision of an instrument together with the degree of consistency or agreement between two independently derived sets of scores, and the extent to which independent administration of the same instrument yields the same or similar results under comparable conditions (Leedy & Ormrod, 2010:29). So, if the same measures were used in this research, and conditions under which the data was collected were held constant, the results should be the same on separate occasions.

Reliability forms an integral part of the validity in the data collection process, in other words, in order to have validity we must also have reliability (Leedy & Ormrod, 2010:29). Reliability can be divided in two groups, external and internal reliability. External reliability can be described as the measurement level of the consistency during the time of the research, as reliability is primarily concerned not with what is being measured, but with how well it is being measured (De Vos, *et al.*, 2003:168). Reliability was enhanced by the use of a combination of data collection methods such as focus groups and a conjoint questionnaire.

To reduce possible error during focus group discussions, the following precautions were taken as recommended by Katzer (1982:64):

- Focus group sessions were arranged to suit participants, with regard to time and location.
- Focus groups met in a neutral environment to enhance open communication between the participants. A maximum number of ten willing participants per focus group attended to allow enough time for each participant to voice their own opinions, express their own individual feelings and perceptions, and describe their own experiences.

To reduce possible sources of error during data collection based on conjoint analysis, the following precautions were taken:

- A cover letter was attached to the questionnaire to emphasise the purpose of the survey and to confirm the researcher's affiliation

- Anonymity and confidentiality were assured in the content of the covering letter in order to inspire confidence and elicit truthful responses
- The questionnaire was constructed in such a manner that it did not take long to complete; the questions were easy to understand and were relevant to the topic
- The questionnaire was subjected to a pre-test trial-run by means of a pilot test
- Only willing individuals were included and enough examples were given to ensure that respondents understood the process
- The questionnaire only contained questions regarding the relevant research objectives
- Permission from the Ethics Committee at the University of Pretoria was obtained before any data collection commenced

One important aspect of reliability in this research was how well the participants understood the conjoint questionnaire. Reliability could have been threatened by the fact that the questionnaire was conducted electronically and no interviewer was present. A lack of a trained interviewer to clarify and probe could possibly lead to less reliable data. A second possible threat to reliability was that the researcher tried to explain the aim of the research and the different attributes carefully, and this might have resulted in biased respondents' answers. If different wording or just some ambiguity in the language is used how the respondents answer can be affected, and this would detract from complete reliability. This was avoided by pre-asking the questions in a pilot study and then clearly stating and deciding how the conjoint interview questions would be asked, and what information would be given to the participants.

6.4.1.3 Generalisation

The generalisation aspect in research relates to the question whether the results could be applied to cases beyond the purpose or focus of the study. This concept refers to finding relevance outside the study. It is a level of how transferable the results are to other settings or environments other than those of the particular study.

When doing a research study, the main reason for using a sample is to save the researcher time and money (Gorard, 2003). The purpose behind it is often to deal with a relatively small number of respondents to obtain the results that you intended to get or try to generalise and apply the findings to a larger group or a population (Gorard, 2003). This research used a mix of convenience sampling and judgement sampling. In convenience sampling a larger number of

individuals in the consumers' natural environment could be reached within a short space of time. Judgement sampling is a method in which the elements are chosen on the basis of the belief that the chosen element would be representative of the total population. A disadvantage of judgement sampling is that it does not show how representative of the population that sample is, although, if the researcher's judgment is correct, the results from sampling this way could be better when compared to convenience sampling. Furthermore, when using a convenience sample, there is no definite intent to sample from the specific but larger population, which means that statistical arguments for valid generalisation of the results of the experiment (Lynch, 1982) cannot be applied. However, the results of the research can be useful in the future for other academics to use in their research in this complex and not yet fully developed field.

A sample size of 352 was considered sufficient to employ all the statistical techniques required for the conjoint analysis.

6.4.1.4 Ethics

Ethics is defined as a set of widely accepted moral principles that offer rules for and behavioural expectations of, the most correct conduct towards experimental subjects and respondents, employers, sponsors, other researchers, assistants and students (De Vos, *et al.*, 2003:62-75). Ethical issues come to the fore in human sciences research when conflict arises between the values of the community in matters such as freedom and privacy, and regarding scientific methods that are aimed at generating data of the highest quality. An ethical dilemma can also arise if the researcher chooses one form of conduct, and respects a certain moral principle, but transgresses another (De Vos, *et al.*, 2003:74).

The following ethical requirements were adhered to for this research:

- Informed consent was sought from participants to participate in the research willingly.
- The researcher ensured that the objectives and the data collection methods of the research were effectively communicated to the participants.
- Since the participants of the research were adults, they had the capacity to give informed consent directly.
- No pressure or coercion was used on the respondents; they were allowed to withdraw from the research at any time.

- The information provided by the respondents was treated with the utmost confidentiality and privacy. Respondents did not provide personal details to link them to the data.
- The research was conducted under the guidance of the study supervisors.
- The Ethics Committee of the Faculty of Natural and Agricultural Sciences at the University of Pretoria approved the research proposal and the measuring instruments.
- As required by the Department of Consumer Science, University of Pretoria, the research findings were compiled and released in the form of a written report with as much accuracy and objectivity as possible for use in publication and referencing.

6.4.2 The conjoint limitations

Certain aspects of the study were less than the ideal.

A number of limitations are associated with this study and are mentioned, along with certain recommendations for future research efforts that might follow as an extension of these findings. It is reasonable to assume that the results of the research would change if the gender distribution of (male and female) respondents (a different respondent ratio) was more balanced, and if the sample had included a more equal proportion of respondents from all South African ethnic groups in the conjoint analysis. The conjoint experiment involved a clear majority of white male respondents and it would be interesting to see if a different gender ratio would give different results. However, since the respondents were randomly chosen from their own settings, this was not something that the researcher could control.

The consumer sample included consumers from the South African Living Standard Measures (LSM) groupings of 1-10, although the purchasing of lamb/mutton is more relevant to the lifestyle of the wealthier LSM groups (LSM 7 -10) - described thus according to official data on the annual cash expenditure of households in the various LSM groups (SAARF, 2009). This can be explained by the higher price of lamb/mutton compared to other meat sources. Targeting only the wealthy consumer segments, or by applying market segmentation, could yield different results.

The geographical focus of the sampling procedure included lamb/mutton meat consumers from all the provinces in South Africa, thus rural and urban consumers were included in the sample. The implication of this limitation could be that the results do not give a specific indication of rural South African consumers' evaluation of the importance that they attach to the attributes of

lamb/mutton. Moreover, the results might also not be representative of all urban consumers in South Africa. Directing the sampling of the conjoint survey to a specific geographical area in South Africa would also most probably have yielded quite different results.

The design of the conjoint analysis may have influenced the results too with regard to the choice of attributes used in the conjoint questionnaire, namely, *traceability, safety, quality, origin* and *price*. There are many other variables that could also possibly influence consumers in their decision-making process concerning the purchase of lamb/mutton. It would be interesting to investigate other possible variables and could be a consideration for future research. Furthermore, examining how the retailers could use the information provided and whether it would assist the marketing aspect of the product, are also issues that could be investigated.

Completion of the conjoint experiment was time-consuming as it took respondents between 30 to 40 minutes to complete the electronic questionnaire, due to the nature of the profile cards and the amount of information on the profile cards that the participants needed to read. Potential respondents were, however, warned at the outset of the conjoint survey that participation would be time-consuming as the total length of the survey was 33 pages and 56 questions needed to be answered. However, findings concurred with similar studies which removed any concerns about the validity of the findings.

The conjoint questionnaire used in the research was in electronic format and distributed via the internet. However, certain population groups or the elderly are less likely to have internet access and to respond to online questionnaires. Due to this fact, a disadvantage or limitation of using the internet to conduct research is the limited control over the sampling procedure as well being dependent on respondent availability.

6.5 Contribution of the study

Consumer behaviour theory with respect to food (Figure 2.2) was explained by using the framework designed by Steenkamp in Wieranga, *et al.* (1997:144) that explained the decision-making process (Figure 2.3) and all the factors that influence the consumer. This theory guided the research process in order to achieve the aims of the research, and helped to understand how and why consumers behave in certain situations. There are many interrelating factors that

influence the decision-making process of consumers when they are considering purchasing lamb/mutton and the findings of this research have confirmed these.

The link between product, place and production has been important in European countries for centuries (Henchion & McIntyre, 2000:30; Kirsten, 2006:1). However, in South Africa, this link, as in the case of 'Karoo lamb', has been left unprotected and vulnerable to misuse as geographical indications (GI) currently have to rely on an inappropriate trademark registration system. According to Bramley, *et al.* (2009:110) three basic objectives are pursued through GI protection that functions as a measure of advancing:

- *consumer protection* through addressing information asymmetries (preserving the reputation and quality)
- *producer protection* through its role in protecting reputation that is seen as an asset
- *rural development* as local resources, natural and human, are engaged in a collective process of production in rural context

However, a question arises as to whether there is a need or potential for GI protection for a specific product like Karoo lamb. According to Grant (2006:129), South Africa possesses agricultural products that could benefit from geographical protection, especially indigenous products with a strong link to a specific region and rural people. The place of origin may then be used as a quality signal and the resources of the region may be captured in the origin-labelled product, as quality attributes, to increase the value of the product.

Currently consumers have no guarantee that the lamb that is sold as 'Karoo lamb', truly originates from the Karoo. There is neither insignia nor a guarantee to protect the origin of 'Karoo lamb' as a special product. The word Karoo could in fact be exploited for the sake of making a profit by people not even remotely linked to the geography or the values and images of the Karoo region.

South Africa is lagging behind in the development of initiatives and policies despite the potential for producing food products of high quality such as 'Karoo lamb' that is also indigenous to South Africa. The initiatives and policies to promote the profile of products of origin hold advantages both socially and economically for consumers, producers and retailers. Tregear, *et al.* (1998:384) identified these advantages and suggests that the traceability of food products that addresses the safety aspects of food is one of its most important benefits. In this research, the

safety of lamb meat was found to be the second most important attribute after price that influenced consumer decision making when purchasing lamb/mutton. The results of the research can contribute to the formulation of policies and initiatives to protect the indigenous resources and products of South Africa that hold social and economic advantages for the specific regions within South Africa through Geographical Indications.

6.6 Recommendations

The main findings of the research can be used to formulate recommendations to retailers. With the utility values gained from the conjoint analysis, assumptions of the best and the worst case scenarios can be made. Furthermore, in marketing initiatives, these scenarios, and explaining how these profiles can be used in future marketing actions in terms of Karoo lamb, can provide information about the utility values and profiles that have the highest preference ratings. If retailers have information about the profiles consumers prefer the most they can promote this profile more than the profile with the lowest utility.

Although there is an increasing demand from consumers for more efficient, effective and trustworthy information regarding food safety and quality, consumer research findings have shown no improvement in the information supply in recent years (Verbeke, 2001:254). By developing traceability systems as a tool for the determination of the quality and safety status, reliable information and feedback to consumers will be available. It is recommended that, when retailers communicate to consumers about traceability, the needs and wants of consumers must be taken into account, especially as they should be tailored according to specific cultural requirements.

From the information gathered during the focus group sessions evidence was found that confirms that Karoo lamb/mutton has a good reputation, and that participants were definitely aware of the product, 'Karoo lamb'. There is, however, scope to increase awareness of the Karoo region per se and 'Karoo lamb' in particular, as it has unique qualities that are linked to the very nature of the Karoo, a point of appreciation among lamb/mutton consumers in South Africa. Through consumer education in terms of the origin of meat and the different meat quality attributes that can be related to the different places of origin, consumers' sensitivity and knowledge about the origin of meat sold in South Africa could be improved. In support of these proven points, it is recommended that steps be taken to foster a geographical indication culture

amongst South Africans. This could be done by making South Africans aware of local products and the history and traditions surrounding them.

Globally consumers are increasingly placing value on products that they can associate with a certain place. In this research place of origin was used as an attribute of 'Karoo lamb', thus the resources of the Karoo region were used to increase the value of the product, 'Karoo lamb'. There is, however, a threat of misuse as producers, not even remotely linked to the geography or the values and images of the Karoo, exploit the regional name for profit. Since the natural environmental factors in a region may cohere strongly with the evaluation of a product from that region, a regional indication may offer better opportunities for differentiating a product than just a country-of-origin label. In the focus groups it was evident that place of origin was seen as a quality signal for lamb that originates from the Karoo, In the case of 'Karoo lamb' it is recommended that, by using a form of certification or a regional indication instead of a country-of-origin label, a guarantee, and the possibility of being able to distinguish 'Karoo lamb' from both foreign and domestic competitors, will be beneficial.

6.7 Suggestions for further research

The researcher identified various opportunities for further research during the course of the research process.

The following suggestions involve issues relating to the sample and sampling.

- **Gender:** The sample group for the conjoint analysis questionnaire comprised a majority of white male respondents. It is proposed that the study be repeated with a more equal distribution of male and female respondents and that the distribution of respondents include all South African ethnic groups and, based on the reasonable assumption that the results of the research would change, a comparison with the findings of this research might produce enlightening results.
- **Geographic area:** The research could be repeated over a smaller geographic area (such as a province only) to investigate whether there are significant differences in terms of consumers' (male and female) evaluation of key attributes that influence their purchasing decision of lamb meat. Using only rural or only urban consumers as participants in the questionnaire would certainly also yield quite different results.

- **Living Standards Measures (LSM):** This research included consumers from all the LSM groups in South Africa, although the purchasing of lamb/mutton is more common among the wealthier LSM groups (LSM 7, 8, 9 and 10) in terms of higher annual cash expenditure of household. The research could be repeated with only the wealthier consumer segments to investigate the differences in the evaluation of the attributes of lamb meat between the various LSM groups.

The following suggestions involving issues relating to the findings are suggested for further research:

- An electronic conjoint questionnaire was used to conduct a part of the research. The research could be repeated using a manual (pen and paper) conjoint questionnaire to investigate whether the quality of the data and the results achieved from the electronic questionnaire are the same.
- A qualitative study where the attributes that were identified in the research as being important in terms of consumer decision making regarding ‘Karoo lamb’, could be further explored.

6.8 Concluding notes

Traceability systems should be developed, implemented and maintained to improve food supply management, to facilitate trace-back for food safety and quality, and to differentiate between market foods with subtle and undetectable quality attributes (Golan, Krissof, Kuchler, Price & Calvin, 2003:17). Food safety and food quality seem to be very important elements of consumer’s conceptions and decision making regarding food and its purchase. Traceability is usually associated with food risk and safety issues, but can potentially be used to ascertain the level of both food safety and food quality. Traceability can also be a powerful tool to help to establish the authenticity of food, and to check that claims made by producers about food are true. Research done by Van Rijswijk and Frewer (2006) stated that consumers might be especially interested in traceability when it is linked to these types of quality assurances.

Geographical indications in South Africa enjoy very limited protection at national level in comparison to the growing importance of geographical indications at international level, although South Africa has indigenous products like ‘Karoo lamb’ which could potentially benefit from geographical indication protection. ‘Karoo lamb’ has a strong geographical connotation and has been part of South African culture for hundreds of years. Through consumer protection that is

one of the features of geographical indications, one of the difficulties that consumers experience is a lack of certification and guarantee that the product which is marketed and sold as 'Karoo lamb' truly originates from the Karoo, and that should be addressed. Geographical indications can prevent the 'passing off' of a product as the 'genuine article', when the product has been sourced from another locale. Through the use of traceability as a tool, traceability can assist in the authentication of 'Karoo lamb' and the firm entrenchment of 'Karoo lamb' as truly a unique product of the Karoo region for which there is no substitute.

ADDENDUM A



FOCUS GROUP PROBE QUESTIONS

Does the name Karoo mean anything to you?

What picture comes to mind when the name Karoo is mentioned?

Does the name Karoo have any value or significance in terms of food production to you?

When buying lamb, does the name Karoo lamb add value to your choice or will you rather purchase ordinary no-origin-known lamb?

Do you avoid purchasing certain brands of lamb meat (for instance non-specific, Namibia or Karoo) above other brands of lamb meat? Explain.

What product attributes, if any, do you take into consideration when you buy lamb meat?

When purchasing lamb meat what attributes is important to you to continually purchase it? Explain.

What is the single most important product attribute that you take into consideration before you make a purchasing decision regarding lamb meat?

What role does labelling/information cues/logo play in your purchasing decision towards lamb meat?

Would you like to know that the lamb you purchase is guaranteed authentic that it originates from the Karoo? Will it have any influence in your purchasing decision?

Will you be willing to pay more for lamb meat from the Karoo that states that it is certified Karoo lamb? (Certified means a product is guaranteed to be the real deal, for example Ostrich meat that is nowadays certified, also Rooibos, which is a unique South African product).

Certified also guarantees a product's quality and safety. Do you value and want the word certified to be attached to Karoo lamb?

Do you know what the term "traceability" means? If your answer is positive explain your understanding of the term.

Do you think that it has any value that meat (lamb) is traceable back to its area of origin? (Origin – area of breeding/feeding).

What type of traceability information will you prefer? (Labelling, certification mark or logo)

Do you think a specific logo that depicts the authenticity of the Karoo as the origin of the product will have any influence on your purchasing decision?

When buying lamb, what affects your ultimate choice of where to buy lamb? Is your choice solely based on price/name or convenience of retailer/butchery, packaging of the lamb or maybe differences on the product label, which for instance may contain more information than the other retailer/butchery?

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LEGISLATION

ABATTOIR HYGIENE ACT 121 of 1992

AGRICULTURAL PRODUCT STANDARD ACT 119 of 1990

ANIMAL IDENTIFICATION ACT 6 OF 2002

FERTILISERS, FARM FEEDS, AGRICULTURAL REMEDIES AND STOCK REMEDIES ACT 36 of 1947

FOODSTUFFS, COSMETICS AND DISINFECTIONS ACT 54 of 1972

GENERAL FOOD LAW, REGULATION (EC) 178 of 2002

MEAT SAFETY ACT 40 of 2000

TRUST PROPERTY CONTROL ACT 57 OF 1988

ADDENDUM A



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When buying lamb, does the name Karoo lamb add value to your choice or will you rather purchase ordinary no-origin-known lamb?

Do you avoid purchasing certain brands of lamb meat (for instance non-specific, Namibia or Karoo) above other brands of lamb meat? Explain.

What product attributes, if any, do you take into consideration when you buy lamb meat?

When purchasing lamb meat what attributes is important to you to continually purchase it? Explain.

What is the single most important product attribute that you take into consideration before you make a purchasing decision regarding lamb meat?

What role does labelling/information cues/logo play in your purchasing decision towards lamb meat?

Would you like to know that the lamb you purchase is guaranteed authentic that it originates from the Karoo? Will it have any influence in your purchasing decision?

Will you be willing to pay more for lamb meat from the Karoo that states that it is certified Karoo lamb? (Certified means a product is guaranteed to be the real deal, for example Ostrich meat that is nowadays certified, also Rooibos, which is a unique South African product).

Certified also guarantees a product's quality and safety. Do you value and want the word certified to be attached to Karoo lamb?

Do you know what the term "traceability" means? If your answer is positive explain your understanding of the term.

Do you think that it has any value that meat (lamb) is traceable back to its area of origin? (Origin – area of breeding/feeding).

What type of traceability information will you prefer? (Labelling, certification mark or logo)

Do you think a specific logo that depicts the authenticity of the Karoo as the origin of the product will have any influence on your purchasing decision?

When buying lamb, what affects your ultimate choice of where to buy lamb? Is your choice solely based on price/name or convenience of retailer/butchery, packaging of the lamb or maybe differences on the product label, which for instance may contain more information than the other retailer/butchery?

ADDENDUM B1

BLACK FOCUS GROUP

Transcription

23 April 2009

SAA Offices

09:00

Tessa: T
Henrietta: H
Focus group answer: F (1-7)

Minutes:

- **T & H:** Welcomes all.
- **T:** Explains focus group process and purpose.
- **H:** Starts with questions.
- **H:** Does the name **Karoo** mean anything to you?
- **F1:** First thing that comes to mind - **desert**.
- **H:** What picture comes to mind when the name **Karoo** is mentioned?
- **F2:** **Farming, sheep and lamb meat.**
- **H:** When **buying lamb**, does the name **Karoo** have an influence on your choice?
- **F5:** No I buy any **cheap brand**. I don't care whether it is **Karoo** or Australian. As long as it is **cheaper** and **fresh**.
- **T:** And in terms of **quality**?
- **F3:** Well how do you know if it is **quality**? For me, I buy from Pick a Pay and for myself that is quality.
- **T:** And when you look at the lamb, what is **quality**?
- **F6:** The **packaging**, you know in the trays, there is no blood, no fat and it looks clean. The colour and the brand, the label that says what it is. If the meat is dullish, I won't buy it, it needs to be red. If it's dullish it may have been too long on the shelf and the meat is not fresh.
- **H:** So, you will definitely **pay more** for a **quality** product?
- **F2:** Yes.
- **H:** Irrespective whether it is **Karoo lamb** or not?
- **F3:** Correct.

- **H:** When purchasing lamb, what is important to you to continue to purchase lamb?
- F4: The taste.
- **T:** The **place** where you purchase meat, is it important?
- F5: Yes.
- **T:** So will you purchase meat at a butchery?
- F6: No, not really. I prefer to go to a retailer like Pick a Pay or Checkers Hyper because it is more convenient to me than to go to a butchery.
- **H:** Do you trust a retailer more than a butchery or is your choice just based on convenience?
- F7: Just convenience, not that I don't trust a butchery.
- F1: I don't trust a butchery at all. We used to buy meat at a **place** where it doesn't seem clean.
- F2: I go to a butchery when buying bulk for the month, but I go to a retailer when a small quantity is needed or if I am running out of stuff.
- F3: At a butchery the quantity is more but I have a problem with the **quality**.
- F4: But **price** also plays a role in when I go to buy in terms of budget constraints. Where I buy also depends on what I'm cooking. I'm prepared to cut off the extra fat or deboning the chicken and rather get six portions at the retailer, compared to getting three at a butchery for the same **price**. For me that is more important. For me I must feel I'm eating the meat, enjoying it and not only sniffing the meat.
- **T:** The next thing is product attributes. Attributes are things like **colour, smell, appearance or the fat content**. I'm going to ask each one of you individually what product attributes is important to you when you buy lamb.
- F5: Number one is the **colour** and **the fat**, because lamb is very fatty. They must remove as much as possible of the fat. The texture, yes and the taste definitely.
- F6: Number one is the taste and the quantity in the package. The **colour** next because most of the meat will be dark when the sell by date comes closer. And the fat must be removed.
- F4: The taste and definitely the **fat content** will be what attract me.
- F7: The **colour, fat and taste**. Definitely the fat.
- F3: Taste very important. The packaging, the overall cleanliness of the meat, not too much fat as I'm not a fatty person.
- F2: Also the **colour**, when you first look at the meat it must be right, the **packaging** must also be neat. Trimmed of all excess fat and further the meat must taste good.
- F1: The **colour** and it must not have **excess fat**.

- **T:** When you say colour, when meat is dark of colour, you assume that it is old?
- F5: Yes.
- F4: I hate it when they put the meat in the freezer and it gets freeze burn.
- F7: It must **look fresh** and has a certain colour.
- **T:** That **colour** is very red?
- F6: Yes, not dark brown.
- **T:** Out of all the attributes, which one is the most important attribute to you?
- F2: The **colour**, it makes you want to buy it. The **fresher** it looks, the better.
- **T:** Are you knowledgeable about labelling and does labelling play an important role to you when you are buying something? Do you look at the label before buying meat or do you only look at the meat?
- F1: I look at the label because for example you get different kinds of boerewors and I only eat a certain kind of boerewors. The difference lays in the taste and Pick 'n Pay boerewors for example tastes different from Champion boerewors. Even if Pick 'n Pay boerewors is cheaper, I'll **pay more** for Champion boerewors because it tastes better.
- F4: People are brand sensitive, they only like certain brands and it is very difficult to switch to a new brand. We know the older brands, know what to expect and what it tastes like.
- F5: I was not even aware that there are different kinds of mutton. To me mutton is mutton, especially if you go to a retailer like Pick 'n Pay where there will be only one brand, comparing to a butchery that will maybe have different kinds.
- F6: That's not true, the butchery can't tell whether it is **Karoo** or not, they just cut the meat and give it to you.
- **T:** Checkers has introduced organic lamb, is that important?
- F3: No, not really. It has drawn a lot of attention now, but to me the **price** is the most important aspect. If it is **more expensive**, even though it claims to be healthier and better, I'll still go with the cheaper brand.
- **H:** If you have to choose between a quickly wrapped meat product compared to a retailer like Woolworths vacuum packed meat, with **clean wrap** and nicely **sealed**, which one will you choose? Does it matter as you are in any case going to cook it?
- F2: If Pick 'n Pay does the same as Woolworths, I'll stop buying at Pick 'n Pay. To me it's the **price factor**. When you go to Woolworths three pieces of meat cost the same as eight pieces of meat at Pick 'n Pay. Woolworths however has **sell by dates** and the meat is **fresher**. Pick 'n Pay caters for the masses. Woolworths at a certain time removes products and it becomes waste, they are very strict but Pick 'n Pay is all right as we haven't died yet.

- **T:** Certification, that's just the label on a product that says that it is a **quality**, **safe product** and the product has gone through the right steps in the supply chain. Do you value such info on a product?
- F2: Yes, it is very important. You have to know that it has gone through the right processes.
- F3: I don't care. I just buy meat.
- F4: I think it is a matter of you trusting the retailers that the product has gone through all the right stages. You don't actually check it.
- F5: Except at butcheries, you never know whether the meat has gone through all the right processes. I don't trust butcheries.
- **T:** Okay, do you know what the word **traceability** means?
- F6: Where **it comes from**.
- **H:** Is **traceability** information important to you? For example, Woolworths products has a code on it and that code is an unique number which can specify the **origin** of the product down to which farmer for instance supplied the meat. You may get ill after eating a product and Woolworths will then be able to **trace** the product back to the right farmer so that the **origin** of the problem can be **traced**. Is it important to you to know that a product is **traceable**?
- F7: I suppose that it is important because sometimes people get sick and they want to go back to the retailer and be able to sue them. The retailer will then be able to **trace** where the product comes from.
- F2: That would be the retailers' responsibility. I personally don't care where a product comes from. I'm complaining to the retailer and they must sort it out. They always just say sorry madam and give you another product.
- F3: I'm very specific and I will like that kind of information.
- F4: I just purchase the product. Beyond that is their problem.
- **T:** It is important to them and not you?
- F1: Yes.
- **T:** As long as the retailer do it, it's fine?
- F5: Yes.
- F6: If you complain, at least they have somewhere to refer back to.
- **H:** As a consumer it is not important to you?
- F7: No.
- F1: As long as it does not increase the **price** of the product.
- **T:** When buying lamb, what affects your ultimate choice? What affects your choice to buy lamb today and not beef?

- F3: Depends on the occasion, I don't want to buy meat and just chew and chew and chew. It's boring. I like bones on my plate when I'm done.
- T: Does **price** play role?
- F2: Yes, because lamb is **very expensive**. I normally buy it when it is on special.
- T: So you don't eat it that often?
- F4: We do, every Thursday. You'll find it at Pick 'n Pay on special then, because price play a big role to me.
- F5: I can't remember when last we ate a leg of lamb. We simply can't **afford it**.
- F6: There is always lamb in my freezer; I like lamb more than beef. I'm not a beef fan at all. When cooking at home I only cook lamb.
- T: So **price** is the most important attribute regarding lamb?
- F7: Yes.
- T: Do you go to a store with the intention to buy lamb or do you see it on special and then the need arises?
- F1: Sometimes the intention.
- F3: For me whatever the **cheapest** option is. I do the grocery shopping, my wife doesn't do it and I am even teaching the kids to buy the cheaper brand. We check the **quality**, the **price** and the **packaging**. I look for the **cheaper option**; if lamb is that I will buy it.
- F2: It goes both ways. Like Sharon said she mostly buys lamb irrespective of the **price**. So if it is on special it is a bonus to her.
- T: Lamb versus mutton?
- F4: Lamb is the best, I never buy mutton. Lamb is tenderer, cooks better and tastes better.
- T: Flavour of mutton to lamb?
- F6: I find mutton too strong, it's difficult to chew and it's very strong. Lamb has more flavour.
- T: Once again, it's very **expensive**. It's something you will buy once a month and not once a week?
- F5: Depends on the occasion.
- T: Do you consider lamb as meat for special occasions?
- F7: In my house yes, not in Sharon's house.
- F1: For me, special occasions.
- T: If we tell you **Karoo lamb** is available, will you be prepared to **pay more** for it? It is for example R10 more per kg than other normal brands of lamb with **better quality** and **traceability** in place. Will you consider buying it?
- F3: Only when it goes on special, yes.

- F2: On special occasions, I'll buy it.
- T: So it will not be your ultimate choice?
- F5: No, it's too expensive.
- T: But if they do have lamb as a geographic indication?
- F7: No, I wouldn't be interested; I don't care where it's from.
- H: But what if the quality of the Karoo meat is better than the other lamb meat?
- F4: Not with my budget. If it's too expensive, no.
- F1: Look, if I have had the money, I will buy it. I don't mind spending money on meat. But now, every cent counts.
- T: Let's say you have the money?
- F2: I'll buy it.
- H: Why will you buy it?
- F3: It's better quality, traceability is in place, the animal is well looked after and the lamb is more succulent.
- T: It is a niche product at the moment and you will find only a small amount of people that are able to afford it and others just don't bother.
- T: If you were not in this economic crisis, would you buy it?
- F4: Yes, definitely. We'll be behaving differently. We will be buying meat at Woolworths once a week.
- T: If you were not part of this focus group, would you have known what Karoo lamb is?
- F5: No.
- F6: I see everything on the television, so if it were advertised I would have known about it.
- F1: I have a pamphlet from Checkers Hyper that explains the Karoo thing. I got my information from there.
- T & H: Thank you for your time; we received a lot of information and insight.

ADDENDUM B2

FIRST WHITE FOCUS GROUP

Transcription

25 April 2009

Kempton Park

14:00

Tessa: T
Henrietta: H
Focus group answer: F (1-8)

Minutes:

- **T & H:** Welcomes all.
- **T:** Explains the process to follow and the purpose of the focus group.
- **H:** Starts with questions.
- **H:** Does the **Karoo** have any value or significance to you?
- **T:** When you say **Karoo**, what is the first thing that comes to mind?
- **F1:** It's a **dry area**, they've got the caves.
- **F2:** The **ostriches**.
- **F3:** Isn't the cosmoses their as well.
- **F4:** No, its very **dry area**.
- **F5:** You're thinking of Namakwaland.
- **F6:** All these **bushes and dry**.
- **F7:** You do see a lot of **flocks of sheep**.
- **T:** They've actually introduced the **windmill** to show the correlation to farming in the area.
- **H:** Does the **Karoo** mean anything to you?
- **F1:** Just **meat, farm land**.
- **F2:** Rural area.
- **F3:** **Tourist destination**, you've got the **Congo caves** there and the **ostrich farms**.
- **H:** What picture comes to mind when you think of the **Karoo**, I think like we already said, it's a **desert, ostrich farmers, sheep farmers**.
- **H:** When buying lamb, does the name **Karoo** influence your choice or would you rather purchase an ordinary no-name brand of lamb?

- F1: I would firstly look at the price.
- F2: It's like organic.
- F3: I don't think I've seen Karoo lamb.
- F4: I've never seen it.
- H: If you go to a butchery and the butcher tells you this is Karoo lamb, would you believe him? Or don't you really trust the butcher?
- F1: Would it have a stamp?
- H: It would have a stamp that the butcher uses for his own purposes, not a certified stamp, protected by law.
- H: Why do you think, would you believe the butcher/
- F1: If you trust, I would believe him, like trusting the organic Woolworths chicken.
- H: What is important to you to continue purchasing lamb?
- F4: The fat, the meat must not have a lot of fat.
- F5: All the visible fat I don't want.
- F6: I agree, because then at home I would anyway cut it off and I actually paid for that fat, I don't like it.
- F7: I like that gland (that lumpy type of gland) to be removed for me; otherwise the meat has a strange smell to it.
- F2: I've got a friend that never cooks lamb, because of the smell, to her it smells bad.
- T: The next thing is labelling, does meat and labelling go together and is it important for you to have a label on it?
- F1: Yes, to identify what kind of meat you're buying. Because sometimes you don't know what you're buying.
- F2: I always look at the label, because it shows how much per kilo the meat costs and I need to label to show me the price.
- F3: The label shows me the sell by date, whether the meat is fresh or not.
- T: And certification, like this is certified organic, that this is safe, do you read that on meat products?
- F4: Say you buy it in packets like for say at Woolies, you would have it but not at butcher.
- T: At a retailer, is it important to you?
- F5: No, not really.
- F6: I just look at the date and the price.
- F7: The sell by date is very important to me.

- F8: I look at the **price**; comes October and then the **price** of lamb goes so much higher because of the festive season around the corner.
- T: That's it in terms of labelling? Okay.
- T: And another thing, would you like to know where your lamb comes from, area/region? Would you like it to be set on the label example **Karoo** or Free State?
- F6: Not really, it's more advertising.
- T: Does it have an influence on your purchasing decision?
- F7: No, not really.
- F8: Not necessarily.
- T: What attributes are important in your purchasing decision? When you go into a retailer with the intention to purchase lamb, what things do you look at when buying lamb?
- F1: We've discussed so many already, the **sell by date**, **packed date**, the **appearance**, the way its been set up, the way its been set up in the polystyrene pack, **minimal amount of fat**, but they get clever, they put the one with the most fat at the bottom so you don't see it.
- F2: And off course the **price**, like the neck and leg all have different **prices**. I've got to decide first what we are going to have, stew or lamb knuckles or soup, so you sort of decide what you are going to have for supper and how many people are you going to have for supper.
- F3: Lamb also shrinks, so you have to keep in mind the quantity you might need for supper.
- F4: That's true and it's very filling.
- F5: The **colour** is important to me.
- T: What is important with **colour**, what do you look for?
- F6: Not the very dark, because it's already going off. **Fresh look** red colour I like.
- F7: **Price** is also important to me.
- T: Out of all those attributes, which one is the most important?
- F8: **Freshness and less fat.**
- F1: If you're prepared to cook, you'll get the lamb, lamb is lamb. Irrespective of the **price**.
- H: So you would pay more if it's **fresh, less fat** and the **colour** is right?
- F2: Yes and its not very fatty.
- H: Explains the term **traceability**.
- H: Traceability - the ability to trace a **product back to its origin** (exact farm etc.)
- H: In terms of **traceability**, is **traceability** information important to you as a consumer or more important to the retailer, because you would complain to the retailer and make it their problem if you did get sick after eating something you bought there? It's the retailer responsibility; do you care for **traceability** information?

- F3: Yes, as a consumer we would feel safer knowing that this product is traceable and such information is available when needed. I then know the product is safe.
- F4: For the retailer it is more important, because if I complain they have to take responsibility, give me my money back and sort out the problem.
- H: Is it important to you to know that the product is traceable or don't you really care?
- F5: It makes us feel that it is a better product if they would trace it back, gives us more confidence.
- T: And now buying lamb from a retailer or butcher, would you consider butcher?
- F8: Well, the butcher has more bulk.
- F6: And the prices are more cheaper, when you buy in bulk.
- F7: Ya, you're right, prices are more cheaper when buying in bulk, I suppose so.
- F5: It depends where you live, because around my area there are no butchers.
- F1: It's so much better buying from a butcher because you can actually see the lamb, they can cut off what ever you need in front of you. What ever you want. Where as buying it at a retailer, you have to take what ever there is. You buying it prepack and we don't know how clean the packing is or where it was packed and was it clean?
- F2: Retailer isn't always as good.
- F7: It also depends on time, sometimes you don't have time and find the butcher is closed and then you have to go to a retailer.
- F7: I buy half a quarter of lamb and freeze it and then I have meat for any time, you've got a bigger variety for making stews or soup or for the braai.
- F2: It depends where I am and do I have the time.
- H: In terms of the butcher, do you perceive the meat to be safer than a retailer? No difference between quality and safety?
- F1: It depends on the butcher I think.
- F3: For me if I can see what I'm buying and when you go to Pick 'n Pay, you don't know how clean the area was when it was wrapped. Because at the bottom you get all this cuts that is fatter or worse quality than the top piece in the packet.
- F4: That why I don't mind going to a butcher.
- F5: I trust my butcher.
- F6: I don't buy lamb that much doesn't like the taste and we're only two people at home, I stop by the retailer when I need meat.
- F7: The taste of lamb, I don't like it much.
- T: Do you find lamb a very fatty product?

- F8: No, I don't think so.
- F1: Lamb is healthy actually.
- F3: If you prepare it right and cut off the outside fat.
- F2: It's very tasty.
- F6: It depends what part of the lamb you're buying.
- F5: The roast is very nice.
- T: And lamb vs mutton?
- F1: I don't like mutton, it's **fattier**.
- F2: Mutton is probably tougher.
- T: Lamb is younger...
- H: Younger than 4 months and then slaughtered.
- T: Would having **GI status** on packaged lamb, would that be beneficial to you, would it mean anything to you, would it make any difference to you when buying lamb?
- F3: The lower **GI** yes.
- F4: We are very healthy eaters and watching our cholesterol, so that would be beneficial.
- T: Lastly **Karoo lamb**, if they introduced it, it's on the market, it's R10 more per Kg, would you buy it? Just for the name status?
- F5: I would buy it once just to taste, if I like it, I would continue buying it.
- F6: I would also buy it to taste it.
- F7: It's like when you go to Woolies and you buy for instance you buy your lettuce or any veggies, you'll make use of it to the very end, when compared to your green grocer, it doesn't last and you throw it away after a day. A lot of wastage, so maybe we would.
- T: **Pay** more for **quality**?
- F8: Yes, definitely.
- T: They did studies on **Karoo lamb** because of the shrubs they eat, there was a difference in taste compared to other lamb, **Karoo lamb** was woodier, shrubby taste.
- F1: It becomes probably healthier meat.
- T: So would you buy it?
- F3: Yes.
- F2: I'm contradicting the **price**, but it's better, yes I would buy it.
- F5: Well, suppose the lamb is out grazing which is better than being kept in a cage.
- T: Lastly, if the **GI (geographical indicator)** is stated on the product, do you think it would work for lamb, is it necessary?
- F4: Well, it would be nice to know.

- F7: If that quality is better, then yes.
- F8: It can be good for advertising as well.
- **H:** If they added an advert, or do more marketing on the Karoo, people would come more aware of the Karoo and support Karoo products. That is what Checkers is doing so well now with that lady that talks in the advert about Checkers' products and what makes them so special. People don't know where or what the Karoo is.
- **T & H:** Thank you for your time and your input, much appreciated.

ADDENDUM B3

SECOND WHITE FOCUS GROUP

Transcription

27 April 2009

Kempton Park

10:00

Tessa: T
Henrietta: H
Focus group answer: F (1-7)

Minutes:

- **T & H:** Welcomes all.
- **T:** Explains the process to follow and the purpose of the focus group.
- **H:** Starts with questions.
- **H:** Does the **Karoo** have any value or significance to you?
- **F1:** Definitely. The **Karoo** is unique.
- **H:** The name **Karoo**, does it mean anything to you?
- **F2:** I just think of it as a **big dry area**, I associate it with the **desert, with sheep**.
- **F3:** Farming, not just sheep but **ostriches** as well.
- **H:** What picture comes to mind when the name **Karoo** is mentioned?
- **F4:** We already said I think big wide **open spaces**, **windmills** and a **lot of dust**.
- **H:** Does the name **Karoo** add value to your choice or would you rather purchase an ordinary no-name brand of lamb?
- **F5:** I'll go for the **Karoo lamb**.
- **F7:** Me too, definitely the **Karoo lamb**.
- **H:** Why?
- **F6:** Because it has that superiority, I think its better compared to **"I-don't-know"** where it **comes from** brand.
- **T:** And if the **Karoo** brand was **more expensive**, would you buy it?
- **F2:** Yes, I would.
- **F1:** I would too.
- **H:** Because you trust the brand name?

- F3: Yes.
- F4: I associate it with **quality**; even though I'm **paying more** I know I'm getting **quality**.
- F5: It also definitely tastes better and much different to the no-name brands you find at a retailer.
- **H**: When purchasing lamb meat, what is important to you to continue to purchase lamb meat?
- F7: **Less fat** on the meat.
- F6: For me, I look at the **freshness** and the **price**.
- F1: I look at the **price** first and the **colour**, it mustn't be too dark red, it must be a light normal red colour because the darker the meat the older I perceive it to be.
- F3: Most important to me is the **price per kg**.
- **T**: When you walk into the supermarket, what is the one thing you look at in packaged lamb? What makes you buy it vs the lamb packet next to it?
- F2: For me **less fat** and I don't like buying meat with bones, because I'm **paying** a lot already for the meat and meat with bones is money down the drain, because I'm going to throw the bones away.
- F5: **Less fat**, don't like fatty meat.
- F3: I look at the packing first; I like better **quality packaging**.
- **T**: And butchery vs retailer?
- F4: Retailer is convenient and fast compared to a butchery, I first have to find one where as I can just stop at my nearest retailer. If a butchery was closed to me, I'll definitely rather go to a butchery.
- F5: Finding a good butcher in your area juggling with kids and work, you rather just pop into a retailer.
- F6: Woolworths has stepped up severely on their butcheries, you can buy the piece of meat you want and they cut it in front of you and package and **seal in the quality** and **freshness** right in front of you. It's like a butcher combined with the convenience of a retailer. You don't have to go to two different places.
- **T**: Do you trust butchery meat compared to a retailer?
- F7: It depends, you can walk into a certain butchery and immediately walk out again because you can see that it is **not clean** or maybe **smelly** compared to another butchery you would immediately trust because it **looks clean** or what ever reason. You can see either you are going to get **quality** at this butcher or not.

- **H:** At a butchery, seeing a whole carcass hanging at the back, would that put you off compared to buying a packaged sealed piece of meat at a retailer?
- F1: I need convenience, buy the piece of meat and get going.
- **H:** What is the most single important attribute that convinces you to buy lamb meat?
- F2: The label, it must have the minimum amount of **fat**, very little fat.
- F3: Me too, too much fat I won't buy it.
- F4: Normally I would **buy** a whole lamb and get it cut up at the butcher in different cuts. I buy all my meat at Meat World and love the **quality** and **freshness** of the meat, if it's fresh; I buy it irrespective of the price.
- F5: I look at the **colour**, it must have the pretty red colour. Dark red is just old meat to me.
- F6: I take out all the **fat**, outside and inside. I love the taste and it's very filling.
- F7: Mutton meat is fattier. And its smell!
- F1: I'm very **price** conscious; I don't pay for fat on meat. It must all be removed. I want value for money not fat.
- **H:** Now we get to the concept labelling. What role does the label play in your decision making process in terms of what lamb meat am I buying today? What do you look at?
- F3: Firstly, I look at the **price** printed on the label.
- F7: I look at the **sell by date** but also for me, I want to know when this piece of meat was cut up. That helps me to determine how **fresh** it is.
- **T:** Do you look at certification stickers printed on labels?
- F4: No, I just look at the **price** and **date** and then take it.
- F1: I think if the product was certified that it did come from the **Karoo** that would definitely influence my decision above the **price** and **date**. Because immediately I associate **freshness**, **quality** and value for money to the certified name. It's like at the green grocer they print on the box of oranges that it comes from the Vaal River farm or the bananas are from Nelspruit, immediately I'm thinking quality and **freshness** because the product is from the area where it is produced.
- F5: I don't care about certification stamps, like at Woolworths they have all this Halaal and organic stamps on everything that is not going to make the product tastier. I actually feel that if a product has a certified stamp on it, it makes it **more expensive**. I look that the **price** and the **date**. Nothing else.
- F6: I look at the **produced** and **sell by date**. That's nice.
- **H:** Do you prefer to see the ingredients list on a label of meat? For example if the meat was spiced or marinated?

- F1: Yes, but I don't buy spiced meat. Its old meat spiced to cover up the oldness. Retailers are tricking buyers.
- F4: Well, I would prefer the list of ingredients anytime, because I hate buying any product that might contain MSG spice or something harmful. With the ingredient list I can determine for myself whether I want it or not.
- F2: I like the **price** and only the **price** on the label of meat because meat is so expensive, I can compare prices per kg.
- F5: I love the weight per kg on the labels of meat, especially when I'm buying for a certain recipe and need a certain amount of meat to make the dish right, because meat shrunk so much when cooked.
- F3: For me, the more description on the label of what it is the better. The more detail, the better trustworthy the product is.
- **H:** Lets say you are know in the store, would you like to know that the lamb meat is guaranteed that it is from the **Karoo**?
- F6: If I'm going to pay a **premium price** for this meat from the **Karoo**, I would definitely want to know that it is really from the **Karoo**.
- **T:** Because they have found that a lot of people are selling **Karoo lamb**, but is not from the **Karoo**, they are only using the name to sell their product.
- F7: People would buy it.
- F1: You want to know that what you are buying is in fact the real deal, because **Karoo** meat has a very distinctive taste because of the "bossie" they eat.
- F3: Also because it **costs** so much, you assume that it is better.
- **H:** Would you **pay more** for a product that is certified that it is indeed from the **Karoo**?
- F2: Yes, definitely.
- F5: Yes.
- **H:** The words **quality** and **safety** goes hand in hand with certification, would you like the word "certified" on your product?
- F4: Yes, I want **safe** and **quality** meat. I don't want to give my family meat that is not **safe** or of good **quality**, they need the nutrients.
- F7: I would love the word certified on meat, so when my mother in law comes for a visit and wants to start making comments about my cooking, she can see for herself I'm only using the best.

- F6: When they have sorted out all the legalities of certification, they must actually make the certified stamp the picture of what kind of “bossie” this lamb ate in the **Karoo** that would make it easier for the consumer in their decision in terms of what kind of taste they are after.
- F4: The name **Karoo** will attach **quality** and value automatically to any product. Pick ‘n Pay now has the “Karoo cuisine”, so they are actually not allowed to use the name **Karoo**?
- **T**: Yes, that’s correct. Because there is no certification or law in place to protect the name, people are using it left and right to sell their products. The name **“Karoo”** is not owned by anyone.
- **H**: Does everybody know what the term **traceability** means?
- F5: Yes.
- **H**: Definition please.
- F1: It means the product is **traceable back** to where it was produced, its **origin**.
- **H**: Is it important to you to know that the product, in this case lamb meat, is **traceable** back to its **origin**, the farm where it grazed?
- F2: Definitely.
- F3: For me too, I would like it because I attach **quality** to a name like the fresh produce if I know from which farmer it is, it will help in my purchase decision
- F4: I don’t care from which farmer the meat comes from. I complain to the retailer and they must sort out the farmer and give me my money back and pay for my medical bill if I had to go see the doctor.
- F5: I prefer the **traceability** info on meat, it’s interesting but also I feel **safer** when buying the meat. I attached the word **safety** to **traceability**. But not only **safety**, also **quality**, because a product that is **traceable** is **safe** but also guarantees **quality**.
- F6: I prefer that the product is **traceable** back to a **specific area**; I don’t care whether it is **traceable** back to the farmer.
- **H**: So you’ll definitely attached that **safety** aspect to a **traceable** product?
- F7: Yes, knowing that there is a way to get back where the product came from.
- **H**: When buying lamb, what affects your ultimate choice?
- F1: Convenience, if I’m in a hurry I’ll go to retailer and if I have time I’ll go to a butcher.
- F3: Retailers have stepped up the butcheries and I feel confident to rather buy it at a retailer.
- F2: For me, **price** will always determine what I’m buying.
- **H**: Do you know what **GI** stands for?
- F5: Yes, I think we have answered it a way already. It is the **place where a product is from**, for example champagne is from France.

- **H:** Yes, that's correct, GI stands for **Geographic Indicator**. Like Rooibos is certified a Proudly South African product.
- F6: But I have to say, I can't remember when was the last time I've seen **Karoo lamb** anywhere?
- F4: Maybe Checkers, because they have that advert now on the lamb saying its "Certified Natural Lamb".
- F7: Yes, but I think its like Woolworths lamb, they sell their lamb as "Free Range".
- F1: See, that's why they need to protect the name **Karoo** and be able to sell lamb as **Karoo** lamb so make my choice much easier. These retailers and their lamb are confusing me, which is the real deal now.
- F2: But if you are a butcher, you would know if you are buying **Karoo lamb**.
- F5: That were trust comes in, do you trust your butcher? What proof is there that the meat he is selling from the **Karoo**?
- F3: We can argue the whole day.
- **H & T:** Thank you for your time and your valued input.

ADDENDUM C



SEMI-STRUCTURED INTERVIEW SCHEDULE TECHNOLOGIST WOOLWORTHS

Retailer

- Does Woolworths sell certified 'Karoo lamb'?
- In terms of the first question, how does the certification sticker on the product label look?
- Is the certification sticker easy identifiable?
- What indication on the product label is there for the retailer that the product is traceable?
- Does Woolworths have traceability systems in place for red meat?
- Does Woolworths comply with South African legislation regarding the traceability of red meat?
- Does Woolworths comply with international standards, for example the European legislation regarding the traceability of red meat?
- Who is responsible for capturing all the traceability information?
- Does Woolworths have the newest and latest traceability system in place to ensure that the data obtained is reliable?
- Does Woolworths have the best traceability system in South Africa?
- What standards does a farmer need to comply with before becoming a supplier of 'Karoo lamb' for Woolworths?
- Does the farmer need to comply with any traceability standards?
- What and who captures the traceability information on the farmer's farm?
- How many visits to the farmer do Woolworths do to ensure compliance?
- Is the traceability system of Woolworths right protected (copyright) meaning unique to Woolworths and that all retailers have their own unique system designed according to law?
- Has the Health & Safety sector ever found anything wrong with Woolworths lamb from the Karoo?
- Is the Government involved in the inspection of the farmer's farm?
- Does the Government audit Woolworths traceability system to ensure compliance with law?

- Does Woolworths keep record of all data from the farmer right through to the store that sells the product?
- How long does Woolworths keep the traceability documentation?
- Is the documentation ever audited to ensure accuracy?
- Why haven't Woolworths ever educated their customers on the traceability information that is available to them and how it works?
- Does the traceability information add extra cost to the ultimate price the customer is paying?
- What benefits are there for the retailer in terms of the traceability of red meat?
- How many customer requests do Woolworths get in a month for the traceability information on 'Karoo lamb'?

Consumer

- What information is there on the product label for the consumer regarding traceability?
- What benefits are there for the consumer regarding traceability?
- How can a customer verify that the 'Karoo lamb' that they are buying is an authentic product?

Traceability

- What makes the traceability system so expensive?
- Would you say traceability systems on food products are needed or a waste of money?
- A computer captures and stores the traceability data, is the data checked before it is captured for finger errors?
- How many people are involved in capturing and obtaining the traceability information from the farmer to the retailer?

ADDENDUM D

SAMIC VISIT – AUDIT PROCEDURES OF THE THREE RETAILERS

CHECKERS (best audit procedure)

LAW – Wholesale Meat Distributors

HACCP

Brand – “certified natural lamb”

Authorised auditory company: SAMIC D Zandberg

Specification of product:

- No hormones, stimulants or iophones
- No antibiotics of heavy metals
- No animal proteins in the feed
- No feedlot animals

Product specifications value added lamb.

Brand managed by: Owner Protocol

HACCP system

Audit schedule:

- Animal production units 1 x annually
- Abattoir & cutting plant 2 x annually
- Retail stores 25% quarterly/1 x annually

SOP: Standard Operating Procedure

Prepared by Hugo Martynuik

Authorised by J van der Merwe

Standard operating procedure for branding

1. The brand information form will be completed & signed off.
2. Protocol received will be discussed with the customer prior to processing.
3. Product specification will be signed off by both parties.
4. All changes will be made in writing and signed off by both parties.

5. An audit declaration form will be completed prior to an audit.
6. Brand audits will be done according to prescribed protocol.
7. Written feedback will be given after brand audits.
8. Corrective actions will be raised from deviations during inspection and corrective action reports will be sent to Central Brand Manager along with the inspection report.

Approved suppliers list general – retention period: indefinitely

Approved suppliers list farmers – retention period: indefinitely

LABELLING INSTRUCTIONS FOR USE

(LIVE) – 14 days providing cold chain is maintained.

To be labelled on shank as per SOP of slaughter process mass, type/grade slaughter date.

Roller marks according agricultural products standards act, act 119 of 1990. The roller mark will include the “CN” identification mark in the second row of the roller wheel and the emblem of the dung beetle will also be applied on the carcass by means of a stamp.

RETAIL: Shelve life 14 days providing cold chain is maintained temp 2 °C – 6.9 °C (max)

Product specifications Prepared by F Ludick

Approved by J van der Merwe

Butterflied leg	Lamb neck	Kidneys
Stuffed leg	Spare rib	Shanks
Lion roll	Rib cutlets	Wors mince
Stuffed shoulder	Rib strips	Turtles

Product description: type & composition – value added lamb to be processed from A2, A3, Natural lamb carcasses between 16 & 23 kg conformation 3-5, size tolerance 1.8 kg, ordering unit – each.

Labelling: box label – keep chilled, best before, production date, product code, batch number.

Individual label – traceability label per P.O number (production order number), list of ingredients.

- Each cut has an ingredient description, example spare rib – lamb rib: spices & herbs (irradiated), sea salt, dehydrated vegetables, flavouring, spice extracts & the micro ingredients – black pepper, onion, garlic & gluten.
- Most of all ingredients include MSG.

SHOPRITE CHECKERS BFN

LAW code: L4031

Plant Reg: 9/046

Product: VAL frozen (compensated)

Shelve life: providing product remains in primary packaging, vacuum packaging x365 days, keep frozen.

Risks controlled: Biological (micro organisms) ex E-Coli

Chemical

Physical ex clothing buttons, metal

Defects (not specified)

Presentation/packaging: compensated lamb 25 packets packed in a food grade cardboard box stamped.

DOCUMENT DISTRIBUTION – CERTIFIED NATURAL

Retail store will be registered for certified natural only if the store undertakes to meticulously maintain all relevant records.

Brand records must be available at the retail store:

- Brand feedback form;
- Inspection report;
- Product specs.

Brand records must be available at the internal brand auditor

- List of retail stores;
- Retail protocol;
- Product specs;
- Audit schedule;

- Audit worksheet;
- CAR

Brand records must be available at Checkers Head Office & SAMIC

- Complete certified natural file.

The following brand documents must be available at Certified Natural Head Office (LAW Groblershoop)

- Complete certified natural file

SOP (STANDARD OPERATING PROCEDURE)

List of approved retail stores Gauteng:

- The Village
- Brooklyn
- Centurion
- Menlyn

Eastern Cape

Northern Cape

Natal

AUDIT SCHEDULE

Purpose/scope: to define a guideline for frequent auditing of all facilities.

Prepared by P. Blom

Authorised by J van der Merwe

Effective date Jan 2007

WHO	WHERE	WHEN	ACTION	REF	RECORDS
Brand auditor	At facilities	According to schedule	1. official audits will be conducted by SAMIC 2. Internal audits will be		



			<p>conducted by appointed LAW personnel</p> <p>3. Facilities to be audited on a regular basis includes:</p> <ul style="list-style-type: none"> - animal productions units; - abattoir; - cutting plant; - retail stores. 		
Brand auditor	Animal production unit	During the year	<p>4. Audits will be conducted according to the following schedule:</p> <p>4.1 animal production units: 10% to be audited per year according to the Code of Practice for Good Stockmanship & Animal Welfare.</p>	HACCP livestock approved supplier protocol	Farm evaluation audit report
Internal live auditor	Animal production unit	During the year	<p>4.2 animal production units: 10% to be audited per year according to the Code of Practice for Good Stockmanship & Animal Welfare.</p>	HACCP livestock approved supplier protocol	Farm evaluation audit report
Brand auditor	Abattoir	2 x a year	<p>4.3 Abattoir will be audited according to HACCP system.</p>	HACCP livestock approved supplier protocol	Farm evaluation audit report
Brand auditor	Cutting plant	2 x year	<p>4.4 Cutting plant will be audited according to HACCP system.</p>	HACCP livestock approved supplier protocol	Cutting plant protocol audit



Brand auditor	Retail store	quarterly	4.5 25% of all retail stores will be audited annually according to the brand protocol. Maximum 35% of this will be audited per Quarter.	Retail store protocol	Retail protocol audit
Internal retail store auditor	Retail store	During a month	4.6 - 100% of all retail stores will be audited 6 monthly - 50% of this must be audited per quarter.	Retail store protocol	Retail protocol audit
Auditor	At facilities	During audit	5. if any major deviations, which will have a direct influence on the brand or product, are found at any of the facilities (APU's, Abattoir, Cutting plant or Retail Stores) it will be re-evaluated within one month.		Audit report
			6. If a minor deviation is found at any of the facilities it will be addressed by issuing a Corrective/Preventative Action Request.		CAR/PAR form

LIVESTOCK SUPPLIER AUDIT: PRODUCER A

- General impression of farm
- Producer quality declaration signed
- Has producer attended info meeting
- Knowledge of producer

- Product specification
- What hormones/stimulants
- How does it get into the animal
- Animal inclined:
 - Paint mark
 - Tattoo
 - Ear mark
 - Correct method of injection (neck, pelvis, shoulder)

CONDITION OF WATER INSTALLATIONS: INFRASTRUCTURE B

- Are mangers neat/leaking;
- Condition of camps & fencing;
- Condition of pens & crush pens;
- Is a loading bay available;
- Any dead carcasses in veldt;
- Condition of vehicle if own transportation is used;
- Handling of animals before slaughter;
 - Water available;
 - Feed;
 - Adequate shade;

MANAGEMENT C

- registers kept
 - number of animals
 - record keeping of marketing
 - movement & censors register
 - post mortem records
 - purchase & storage of medicines register
 - medicine treatment register
 - feed inventory
- condition of veldt
- gazing paddock system

- condition of animals
- dosing & dipping program
- traceability:
 - is producer registered for tattooing
 - is tattoo certificate available
 - does the tattoo mark correspond with certificate
 - does the producer have his own ear mark
- Medicines:
 - medicines store card prove
 - are medicines stored separately from chemicals
 - are expiry date checked
 - are medicines locked away
 - are self mixed medicines present
 - condition of injections & equipment

LIVESTOCK CORRECTIVE/PREVENTIVE ACTION FORM (ACTION PLAN TO CORRECT WHATS WRONG)

Abattoir protocol audit

CCP1: Ante-mortem inspection:

- Animals delivered to lairage – handling of livestock; verification of documentation;
- Method & procedure for conduct in ante-mortem inspection quarantine;
- Held in lairage – handling of livestock;
- Lot sorting;
- Receiving of animals to be slaughtered.

CCP2: Pre-operative checks:

- Staff fitness checks
 - Health
 - Personal hygiene
 - Protective clothing
 - Jewellery
- Cleaning of facilities

- Monitoring of cleaning
- Barlog
- Surface swabs

CCP3: Meat inspection

- Record for primary meat inspection
- Lights
- Secondary inspection
- Contamination
- Schedule 8
- Secondary inspection livers
- Partial & total condemnations

CCP4: Refrigeration

- Record temperature
- Checking of internal temperature
- Wind speed
- Capacity
- ARM system
- Corrective action
- Control of yeasts & moulds
- Mixing of cold & warm carcasses
- Cleaning process

Traceability:

- Tagging of carcasses
- Recall procedures
- Customer feedback

CUTTING PLAN PROTOCOL AUDIT

- Quality control ex contamination of carcasses
- Receiving of wrapping & packing material: status approved stamp

- Vacuum inspection: inspection of vacuum
- Boxing & labelling: batch number, reject stamp, records
- Bacteriological results: chlorination system (surface, water, meat)

WOOLWORTHS

Mariandel Smith (SAMIC)

Dirk Borstlap 083 703 0442

gary@lentaba.co.za (Port Elizabeth free range beef biltong)

Cradock abattoir – carcass selection form – free range (beef) biltong.

Free Range

Woolworths specifications & procedural guide:

From farmers – good management of herds.

Breed: SA mutton/Dohre Merino & Dorper, No fat tail breeds.

Sex: wethers, ewes, rams younger than 6 months of age, rams older than 6 months excluded.

Mass: 16.1 – 21.0 kg (cold mass carcass)

Farming conditions: “Woolworths animal Husbandry Code of Practice: Lamb/Mutton Production”.

- Written records of feed
 - ingredient composition
 - source of ingredients
 - feed issues;
 - quantities feeds fed per camp.
- Camps allow 13 max per hectare = 2 LSU/ha

PROCESS AUDITING

- Assistance of third party SAMIC – abattoir will be audited at least once a semester;
- Updated list of farmers supplying Free Range must be supplied to Woolworths Farm & Abattoir technologist on a regular basis for auditing purposes.

ON FARM AUDITING

- Traceability: (tattoo mark ex), stock register
- Brand specification: breed, sex, age, no stimulants or antibiotics
- Feed specification: no animal by-products, fresh water
- Animal welfare: camp design, secure fencing

AT THE ABATTOIR AUDITING

- Traceability: farm declaration of origin, GRN, stamp, carcass identity number
- Animal welfare:
 - Unloading (sand, injury free, good lighting)
 - Holding facility (injury free, clean, covered pens, water)
 - Stunning: single file, humane procedures, good lighting
 - General: no prodders, effective pest control
- Dressing: sticking – effective bleeding, carcass wash, sticking within 15 seconds, two knife system
- Carcass: ID number, classification A2, mass 16-20 kg, bruising none, Ph < 6, very important must have free range stamp

AT THE DEBONING & PACKAGING PLANT AUDIT

- Traceability: - carcass declaration of origin & list of farmers
 - Delivery rate from abattoir
 - Primal separation & labelling
 - Retail separation & labelling
- Deboning primals: hand washing, knife sterilization, breaking room empty & cleared before starting FR processing
- Retailing processing: retail room max 10°C, clean, no breaks on floor, follow cutting procedures & specifications; retail check – fat & bone, bone dust removed, discoloration, contamination, product temp < 5°C

Lamb abattoirs to be audited for Woolworths Free Range

- Gariiep Organic Meat in Strydenburg
- KLK Upington
- LAW de Aar

- LAW Groblershoop

(audited 3 months after first supply, audited 2 a year)

(visit to abattoir – 5 farms needs to be audited)

ON THE FARM AUDITING

- Traceability (tattoo mark ears), stock register, signed free range declaration for each.
- Brand specification (breed, sex, age)
- Feed specification (no animal by products), fresh water;
- Animal welfare: camp design, no injury, secure fencing, truck design, no injury, no podders used.

The deboning & packaging plant audit (same as Checkers)

Organic meat processors Liebenbergstraat Strydenburg (a few farms).

Free Range suppliers:

Middelburg

Kokstad

Port Alfred

Queenstown

Kenton on Sea

Berdford

St Francis Bay

Cradock

KLK Uptington Free Range Karoo Lamb Farmers:

Gharms	Rooiwater	Groot Mier
Stofbokkies	Kakoup	Klipbakke
Geelkop	Middelplaas	Droehout
Jebeka	Struisblok	Swartmodder
Kaalvlakke	Delaray	Rooiputs
Kameelpoort	Leeukop	Arries
Sterkstroom	Boksputs	Kleinbegin

Ultgesicht	Moddergat	Latrivier
Volmoed	Oupashoop	Florida
Kort Draai	Sandvlei	Volmoed
Vra Wein	Patsies	Zandberghoop
Renosterkolk	Tiervlei	Varkfontein

PICK 'N PAY

Crista Malan (Technical Manager, Pick 'n Pay Butchery)

011 856 7935

082 334 1197

cmalan@pnp.co.za

www.picknpay.co.za

Sells: COUNTRY REARED PROGRAMME OF PICK 'N PAY

- Chicken
- Beef
- Lamb
- Pork

COUNTRY REARED FREE RANGE LAMB

Audits - Retail: 6 monthly inspection by SAMIC to evaluate grading, classification & labelling.

Farm audit: 10% producers to be audited annually.

Abattoir: annually, food safety audits 3rd party body (SAMIC).

No fat tailed lambs are permitted. Lambs grade code A1, A4, 13-16 kg – may only be sold in bulk form i.e. whole, half, lamb packs.

Abattoir: meat requirements in Meat Safety Act 40 of 2000.

- also all abattoirs undergo a safety audit
- "Meat safety act & regulations 40 of 2000

Pick 'n Pay country reared programme farm audit lamb

- Genetic history & brand specifications: SA breeding flocks, free from diseases
- Stock feeds: good quality, stored in dry areas, free of mould
- Transportation: trained staff, no overloading of trucks
- General welfare: parasite control measure, rested prior to slaughter min 18 hours
- Veterinary treatment: - Id of treated animals
 - Record keeping
 - Clean equipment
- Maintenance of natural environment: grazing may be supplemented, resting period, ID of pastures, water sources
- Soil quality & persistent chemicals: soil, contaminated sites
- Shelter
- Natural light: sunlight access
- Shade: free access to shade
- Chemicals: prescription chemicals, were purchased, environment friendly, limited access
- General criteria: no growth hormones etc, system must be in place to ensure traceability
- Staff training: on going training on the job

AUDIT BRANDING

- Abattoir
 - Traceability
 - Farm of origin
 - Owner name & address
 - Carcass ID
- Welfare
 - On-loading
 - Injury free
 - Non slip floors
 - Handling pens
 - Clean etc.
 - Ventilation
 - Travelling distance /resting every 2 – 5 hours

- Stunning
 - Humane procedures
 - Good lighting
- General
 - No prodders
- Dressing
 - Two knife bleeding system
 - 30 sec stunning to bleeding
- Carcass
 - Classification
 - Mass
 - Roller mark

GENERAL

Two kinds of abattoirs:

Classification: 205

Non-classification: 245

Total in SA: 450

Registrasie: Trade & Industry en Department van Landbou

South Africa has its own audit process, completely different than overseas, Namibia & Botswana are now going to implement and start using our SA audit procedure.

When doing an audit process at a retail, no prior communication is send out to inform the retailer of audit – it's unexpected.

Farmer – is informed of audit process mainly due to the possibility of the farmer not being there that day, it's too far to drive.

Abattoir – audit is unexpected and unannounced.

No difference in lamb & pork audit process.

Audit process is conducted on request. If not compliant, audit process will be done again.

Either the retailer/abattoir/farmer is compliant or not complaint, no in-betweens.

So far no problems with South African audit process.

SAMIC contains documentation of 14 retailers in SA, not all selling lamb.

11 Provinces in SA.

Farms include:

North West Province	7
Northern Cape Province	402 & 750
Southern Cape Province	1150
Western Cape Province	120
Eastern Cape Province	64