A consumer perspective of the South African red meat classification system

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Abstract
The South African consumer market is characterised by socio-economic and cultural diversity. Food expenditure patterns, behaviour and preferences differ significantly between the various socio-economic sub-groups. Packaging information, including red meat classification information, could be an important tangible resource used by consumers to gauge product quality. The first objective of the research reported in this paper is to investigate the red meat knowledge, usage and perceptions regarding beef and sheep meat classification and related quality parameters among South African consumers. Consumer perceptions of red meat classification were extracted from a comprehensive consumer survey among stratified representative samples of South African low-, middle- and high-income consumers (n = 165, n = 171 and n = 249). The paper also briefly reports on an in-store 'observational' research project that was conducted to develop an understanding of the communication of carcass classification to consumers through fresh red meat product labels at independent butchers and large retailers across South Africa (n = 60). Low-income consumers had very limited understanding and gave little attention to red meat classification. Even though middle-class and wealthy consumers also have a limited understanding of red meat classification, about half of these consumers check for a classification mark. Red meat classification was not mentioned by consumers as a major concern regarding red meat, but related aspects were important such as quality, fattiness, tenderness, juiciness, taste, freshness, smell and appearance. Purchase considerations for beef and mutton/lamb focussed largely on safety, appearance, price and eating quality. Labelling information observed at retail outlets gave very little attention to classification. There is a definite need for consumer education relating to the red meat classification system and for the development of an appropriate front-of-pack labelling system to communicate red meat classification.

Introduction

The South African Carcass Classification System classifies lamb, mutton, beef and goat carcasses based on a set of predefined characteristics mainly focusing on animal age and the fat content of the carcass. The type of production system (i.e. grain-fed versus grass-fed animals) is to some extend embedded in the classification criteria. This system has been in use since June 1992 (Agricultural Product Standards Act, 1990 (Act No.119 of 1990)). Carcass class is indicated on the carcass by means of a coloured roller mark stamp. After processing into retail cuts only some cuts will display the roller mark (Healthy Meat South Africa, 2012).

Even though the system plays an important role in classifying red meat carcasses to facilitate carcass price formation, it should play a role at the consumer interface. Various classes within the carcass classification system imply different product characteristics which should enable consumers to make decisions about desirable product options.

The South African consumer market is characterised by socio-economic and cultural diversity. Various tools exist to classify consumers within this socio-economic spectrum. The income and expenditure deciles applied by Statistics South Africa (StatsSA) for their Income and Expenditure Surveys (StatsSA, 2012a) each represent 10% of the population from an income or expenditure point of view. Another widely used tool which

will be discussed in this paper in more detail is the Living Standards Measure (LSM®) market segments developed and maintained by the South African Audience Research Foundation (SAARF). Socio-economic status increases with increasing LSM® level (SAARF, 2013).

Various lifestyle levels can be identified across the LSM® spectrum. For example, one approach is to distinguish between marginalised/poor consumers (LSM® 1–4), the middle-class (LSM® 5–8) and wealthy consumers (LSM® 9–10). In general the SAARF LSM® segments are not directly based on the income levels of consumers, but are based on consumer access to various amenities, such as durables, household location and dwelling type. Table 1 presents a summary of the characteristics of these lifestyle levels.

Table 1 Overview of the three main lifestyle levels within the 10 Living Standards Measure (LSM®) segments *(Sources: BFAP 2014, based on data from SAARF All Media and Product Survey (AMPS®) 2013; StatsSA 2012a)*

	Marginalised/poor group	Middle-class	Wealthy consumers
LSM® segments	LSM® 1 - 4	LSM® 5 - 8	LSM® 9 - 10
Share of SA adult population (15 years+)	22.3%	61.2%	16.5%
Average household monthly income (self-reported)	R1480 to R3205	R4344 to R16754	R23539 to R36883
Estimated contribution to total purchasing power in South Africa	± 5%	± 50%	± 40% to 50%
Estimated share of total expenditure allocated to food and non-alcoholic beverages	35% to 34%	32% to 15%	10% to 6%
Dominant education level	Up to primary completed Some high schooling	Some high schooling Matric	Matric Post-matric qualification
Dominant age groups	15 - 24 and 50+	15 - 49	35+
Dominant location (rural/urban)	Mostly rural, some urban	Increasingly urban	Urban
Dominant provincial location	KwaZulu-Natal, Eastern Cape, Limpopo	KwaZulu-Natal, Gauteng, Western Cape	Gauteng, Western Cape, KwaZulu-Natal
Unemployment rate (self-reported)	41% to 43%	38% to 17%	Insignificant
Dominant dwelling type	Traditional hut, house/cluster house/town house	Matchbox house, house/cluster house/town house, flat	House/cluster house/town house, flat
Share of group with access to in-home electricity	27% to 93%	98% to 100%	100%
Share of group with access to tap water in home or on plot	0% to 52%	82% to 100%	100%

Class mobility is a prominent feature of the South African consumer market, where consumers move towards higher LSM® groups driven by economic growth as well as socio-economic empowerment. As is evident from Figure 1, from 2004 to 2013 the share of South African adults in SAARF LSM® segments 1 - 4 declined (−56%), accompanied with an increase in the share of the adult population classified in wealthier segments such as LSM® 7 (+99%), LSM® 8 (+82%), LSM® 6 (+69%) and LSM® 9 (+68%). In recent years the class mobility rate has been variable. In generally increased in most of the socio-economic sub-groups after slowing down from 2007/2008 to 2009/2010 due to recession impacts (BFAP, 2014).

Food expenditure patterns differ significantly between the various LSM® groups as illustrated in Figure 2. (as estimated from the Statistics South Africa (StatsSA) Income and Expenditure Survey 2010/11) (StatsSA, 2012a). Marginalised consumers spend the largest relative share on grain-based staple foods (32% of their total expenditure), followed by meat products (22%), vegetables (11%), and dairy and eggs (8%). The middle-class group spends relatively less of their total expenditure on grain-based staples (26%), relatively more on meat products (26%), followed by vegetables (10%), as well as dairy and eggs (9%). The wealthiest segment of the population spends only 16% of their total food expenditure on grain-based staple foods, with meat representing their main expenditure category (27%), followed by dairy and eggs (11%) and vegetables (9%).
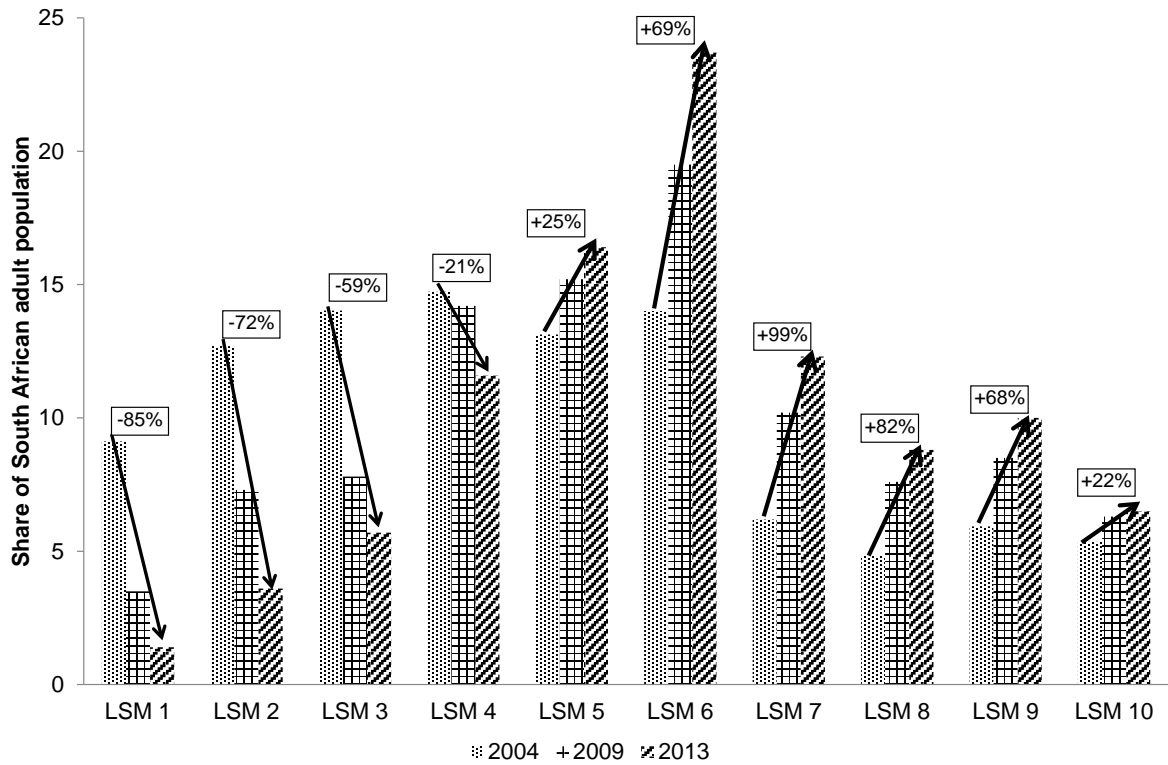
Figure 1 Class mobility among Living Standards Measure (LSM®) segments from 2004 to 2013.
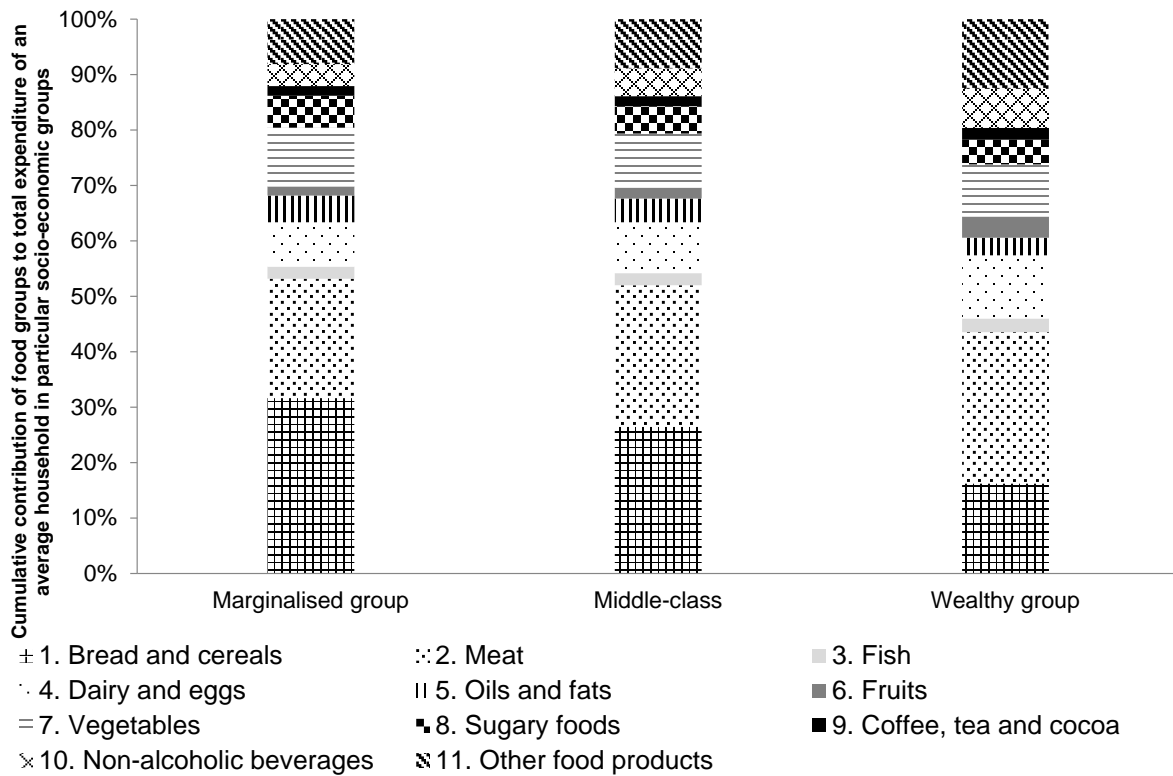*(Source: BFAP 2014, based on data from SAARF AMPS® 2004 to 2013).*

Figure 2 Estimated food expenditure composition of the main socio-economic sub-groups in South Africa.
(Source: Calculations based on data obtained from Statistics South Africa Income and Expenditure Survey 2010/11) (StatsSA, 2012a).

The meat expenditure patterns of South African consumers, estimated from the Statistics South Africa Income and Expenditure Survey 2010/11, indicate that the middle-class dominated the expenditure on poultry. The wealthy segment dominated spending on sheep meat as well as pork. The middle-class and wealthy groups both had large expenditures on beef, processed pork and beef sausage (see Figure 3). Despite consuming all meat types, the low-income consumer segment has a clear preference for chicken followed by beef, as evident from Figure 3.
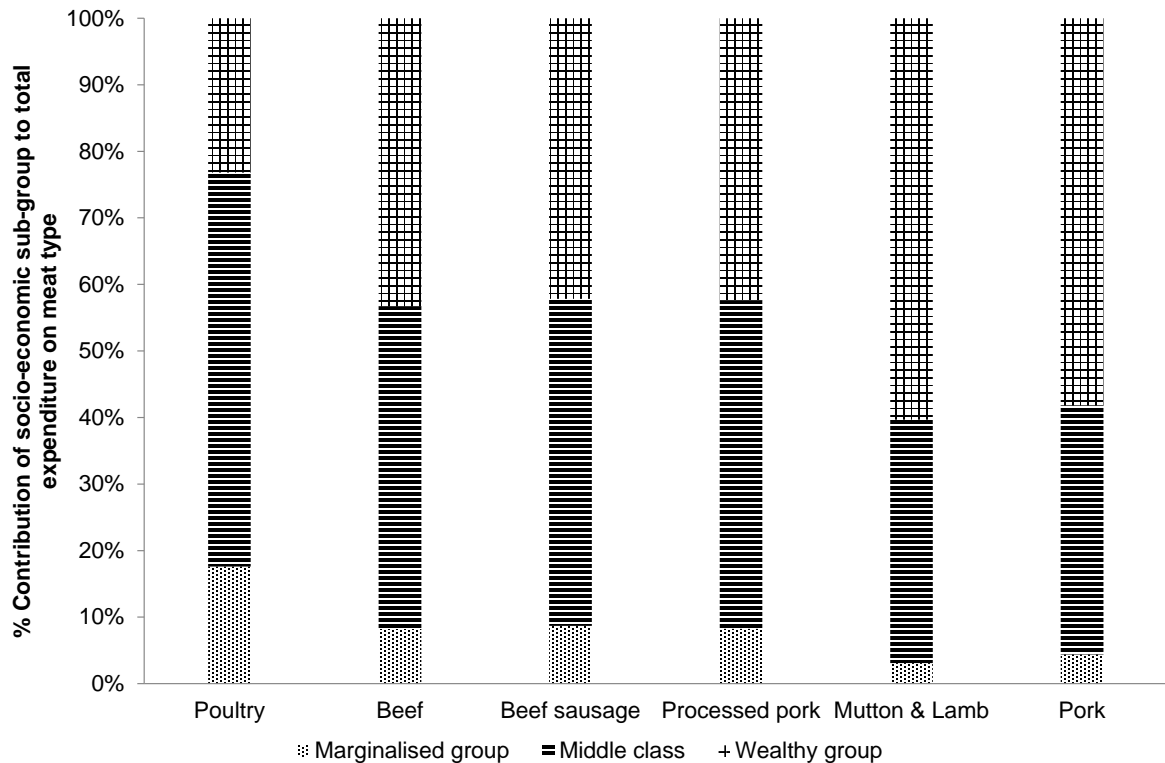

Figure 3 Meat expenditure patterns of socio-economic sub-groups in South Africa.
(Source: Calculations based on data obtained from Statistics South Africa Income and Expenditure Survey 2010/11).

Due to factors such as class mobility, urbanisation and changing preferences, the meat expenditure patterns of South African consumers are changing over time. To illustrate some of these changes, Figure 4 presents the changes in the annual expenditure of households on particular meat types after removing the effect of inflation (i.e. real changes in expenditure) (BFAP, 2014 based on data obtained from Statistics South Africa Income and Expenditure Surveys 2005/06 and 2010/11 [StatsSA, 2008; StatsSA, 2012a]). The most significant increases in real household expenditure on particular meat types, implying higher consumption levels from 2005 to 2010 were:

- Marginalised group: Processed pork (+121% increase in household expenditure above inflation), Poultry (+21%); Beef (+17%), Beef sausage (+3%);
- Middle-class group: Pork (+123%), Processed pork (+80%), Beef (+13%), Poultry (+5%);
- Wealthy group: Processed pork (+48%), Beef sausage (+9%), Pork (+5%), Beef (+5%).

The middle-class group experienced real expenditure growth in the largest number of meat categories (all except for sheep meat) from 2005 to 2010.

When purchasing products, including red meat, how consumers evaluate quality, will influence their purchasing behaviour. Quality is a complex concept with many definitions depending on perspective. Quality can be defined as the 'totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs' (Kotler, 2000). To classify quality characteristics in a meaningful manner, it is necessary to consider a suitable conceptual model of the quality perception process. For this purpose the model developed by Steenkamp (1989) (as applied by Oude Ophuis & Van Trijp, 1995) are presented where a distinction is made between quality cues and quality attributes (see Figure 5 for examples of meat quality cues and attributes and Diagram 1 depicting the conceptual structure of this model). Ultimately the

combination of environmental cues, personal factors, situational factors, quality cues and quality attributes could impact how consumers perceive the quality of the particular product.

Consumers are able to determine quality 'cues' with certainty before consumption by using their senses. 'Intrinsic quality cues' are part of the physical product and cannot be changed without changing the physical characteristics of the product itself. 'Extrinsic quality cues' are related to the product but not physically part of the product and can thus be changed without changes to the physical product.

Quality 'attributes' are product characteristics that deliver potential benefits to the consumer, but can only be observed after consumption and thus consumers generally have to rely on their perceptions of these attributes to form quality judgments prior to consumption. 'Experience quality attributes' can only be evaluated with certainty by the consumer after consumption and an actual experience of the product.

'Credence quality attributes' are 'intangible' and cannot be evaluated with certainty by the consumer even after consumption. Consequently consumers have to rely on judgment or the information of other role-players to develop certainty that the particular attribute is part of the particular product.

The quality cues and attributes linked to red meat classification are shown in Bold and Italic font in Table 2. Some factors are directly linked to red meat classification, such as the intrinsic quality cue 'visible fat on meat', the experience quality attributes 'fattiness of meat in terms of non-visible fat' and the intangible quality attributes of 'animal feeding practices' (in particular grass-fed versus grain-fed) and 'age of animal at time of slaughter'. The latter factor was listed as intangible as most consumers may not have the expertise to judge animal age based on the visual appearance of the meat and have to rely on product information supplied in this regard. Other factors could be linked indirectly to red meat classification in Table 2, such as meat colour, fat colour, taste, tenderness, juiciness, healthiness and nutritional value of the meat (e.g. in terms of fat content).

To utilise the South African Carcass Classification System for informed decision-making, consumers need a proper understanding of the various classes, as well as the quality attributes implied by these classes. Doubt arose in this regard, leading to a number of critical research questions. Do South African consumers across the socio-economic spectrum understand and utilise the Carcass Classification System when purchasing red meat? Do they understand the quality implications of different carcass classes? Are the quality signals (i.e. roller marks on meat and/or labelling information) in place to facilitate informed decision
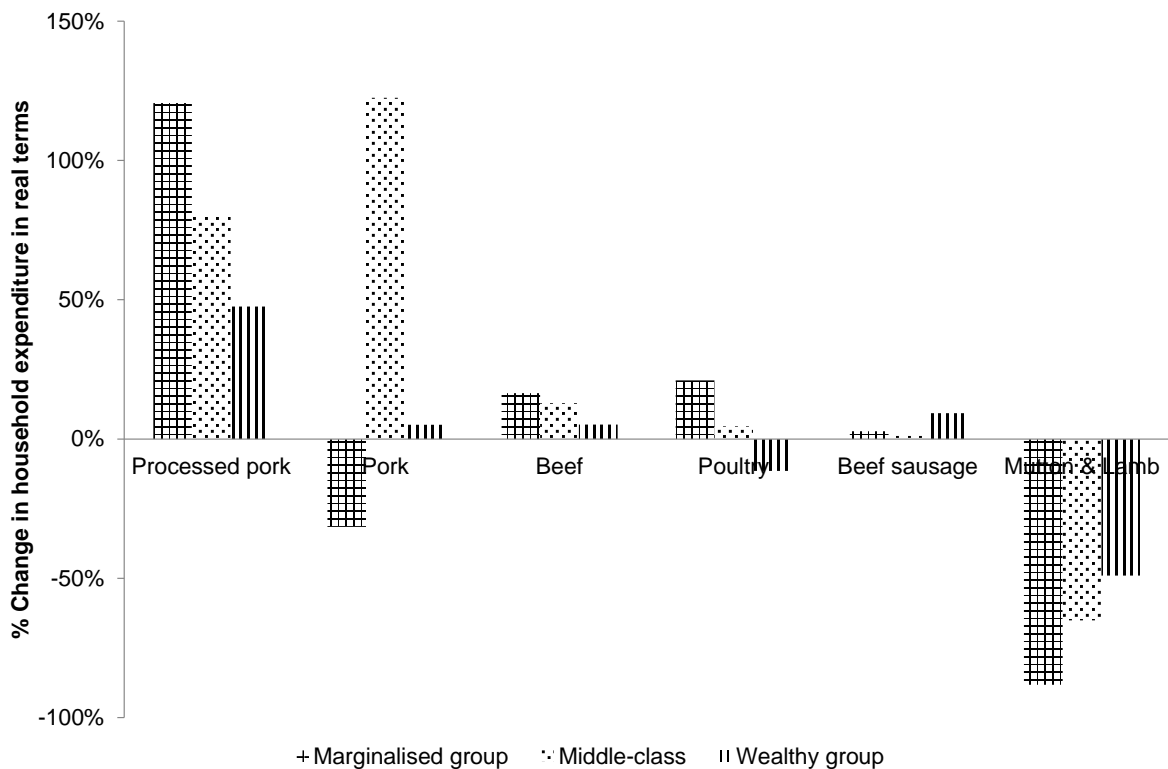

Figure 4 Real changes in the expenditure of households on main meat types by socio-economic sub-groups in South Africa 2005 and 2010.
(Source: BFAP 2014 based on data from Statistics South Africa Income and Expenditure Surveys 2005/06 and 2010/11).

Table 2 Examples of quality cues and attributes applicable to meat
(Source: Adopted from Oude Ophuis & Van Trijp, 1995)

| QUALITY CUES:	QUALITY ATTRIBUTES:
Intrinsic quality cues: (Part of physical product) - Cues related to meat appearance - Shape of meat (meat cut) ***Amount and proportion of visible meat, fat and bone*** ***Type of meat (e.g. beef of lamb)*** ***Meat colour*** ***Fat colour*** - Size of meat cuts	**Experience quality attributes:** (Can only be evaluated with certainty after consumption) ***Taste*** - Freshness ***Fattiness of meat in terms of non-visible fat*** ***Tenderness*** ***Juiciness*** - Convenience - Safety ***Texture of meat***
Extrinsic quality cues: (Related to product but not physically part of it) - Price - Brand name - Manufacturer name - Information on meat label related to aspects such as: - Warrantee - Certification marks ***Carcass classification*** - Quality guarantee statement - Nutritional value of the meat product - The origin of the meat - Animal breed - Production practices e.g. animal friendly production, environmentally friendly production, organic production, free range production, animal feeding practices. - Purchase location - Packaging type / format	**Credence (intangible) quality attributes:** (Cannot be evaluated with certainty by the consumer even after consumption) ***Age of animal at time of slaughter*** ***Healthiness of meat*** ***Nutritional value of meat*** - Safety - Naturalness - Wholesomeness - Traceability - Animal friendly production practices - Environmentally friendly production practices - Organic production practices - Free range production practices ***Animal feeding practices*** - Hormones / antibiotics used during production of animals - Food miles associated with meat product
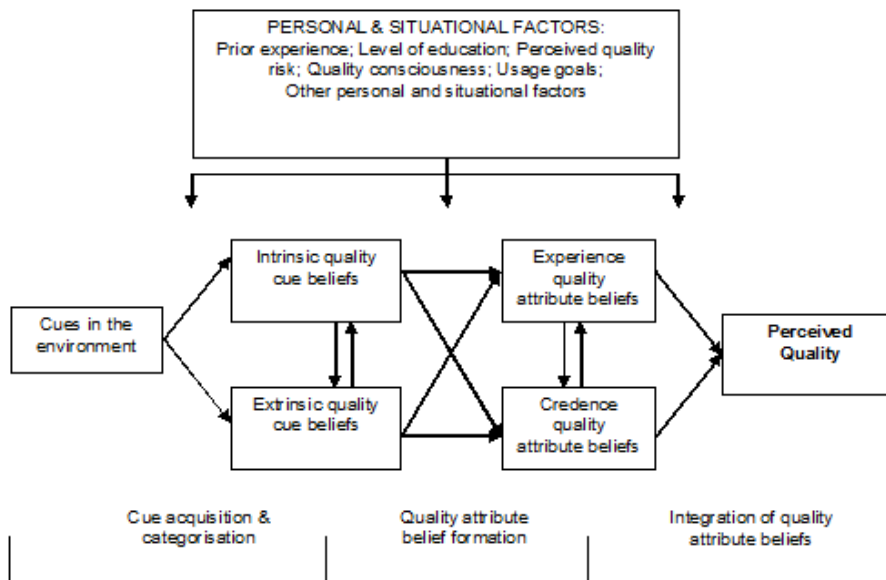
Diagram 1 Conceptual model of the quality perception process (Source: Steenkamp 1989).

making regarding carcass classification? The last research question is of particular relevance in the light of the identity loss created when roller-marked meat is processed into individual cuts where some of these cuts will not display the roller mark.

Due to the lack of relevant scientific data the first objective of the research reported in this paper was to investigate South African red meat consumer knowledge, usage and perceptions regarding beef and sheep meat classification and related quality parameters among low-, middle- and high-income consumers. The paper also reports on an in-store observational research study that was conducted to develop an understanding of the communication of carcass classification to consumers through fresh red meat product labels.

Materials and Methods

The data reported in this paper were part of a comprehensive consumer research project conducted during 2012/2013 on behalf of the South African Red Meat Industry. The overall project objective was to investigate South African consumer behaviour towards and perceptions to red meat. Consumers were divided into three socio-economic groups: the marginalised class (low-income consumers) (LSM[®] 1–4), the middle-class (middle-income consumers) (LSM[®] 5–8) and the wealthy group (high-income consumers) (LSM[®] 9–10) residing in the Gauteng Province of South Africa. The specific focus of the study was current meat purchasing and consumption behaviour, behavioural motivations and perceptions of red meat, and current and most trusted information sources relating to red meat. The survey questionnaire drew on previous questionnaires that were used to compare data (Meat Board's Quantitative Survey, 1996; Protein survey, 1996; Quantitative survey, 1997; South African Pork Producers Organisation (SAPPO), 2000). The questionnaire was also tested in a pilot study in Limpopo to validate it (De Cock *et al.*, 2013). A wide range of question types were used including dichotomous questions, multiple choice questions, Likert scale/level of agreement, rating scale questions and open-ended questions.

The survey targeted adult consumers from both gender groups responsible for food purchasing and preparation in their households residing in the Gauteng Province of South Africa. Gauteng is the smallest province in South Africa, but generates 34% of South Africa's Gross Domestic Product (GDP). A fifth of the South African population (11.3 million people) resides in Gauteng. It is the wealthiest and most densely populated province (City of Johannesburg, 2013). Quota sampling was applied with the sampling plan which had been designed by the research team to reflect the characteristics of the South African population in terms of LSM[®] segment, age category and ethnic groups (n = 165, n = 171 and n = 249 for the low-income group, middle-class group and wealthy consumer group, respectively). No formal female/male split was included in the sampling, but it was expected that the sample would be dominated by female consumers given their traditional dominance in household food purchasing. Table 3 presents a summary of the planned and actual characteristics of the sample in terms of LSM[®] segment, age category, ethnicity and gender group.

This study was approved by the ethics committee of the University of Pretoria (Ethical Clearance certificate: EC 11118/072). Participants were ensured of confidentiality and encouraged to provide accurate answers.

Data gathering was done during 2012 and 2013. A typical consumer interview lasted between 90 minutes and two hours. Panel recruitment was done through a professional consumer panel recruitment agency ('Consumers in Focus'), to ensure the validity of the sampling process. Sampling of consumers was done randomly in Johannesburg and surrounding areas. Door-to-door recruitment was done where consumers were first screened for shopping role and demographics profile. A screening questionnaire was used to verify the LSM[®] segment of the household and other screening criteria. Once qualified, potential consumers were invited to participate by means of one-on-one interviews, at convenient times at their homes. Participants were incentivised. A random sample was back-checked by 'Consumers In Focus' personnel after questionnaires were returned to gauge recruiting accuracy and monitor interview protocol adherence. The meat scandal relating to the presence of foreign meat species in local meat products broke in the media while field work was being performed for the middle-class group. This was taken into consideration when evaluating responses.

Data capturing and cleaning was done in Microsoft Office Excel 2007, after which a wide range of descriptive, comparative analyses (ANOVA (Analysis of Variance) and Chi-square analyses) and multivariate techniques were applied to analyse the data with SPSS (Statistical Package for the Social Sciences) version 21.0.

In addition to the consumer survey, as mentioned above, this paper also reports on a second survey of a different nature involving in-store observational research of fresh red meat products. The second survey was conducted to develop an understanding of the communication of carcass classification information to

Table 3 Summary of the planned and actual characteristics of the sample in terms of Living Standards Measure (LSM®) segment, age category and ethnicity

Sub-segment:	Variable:	Levels of variable:	Share of sub-segment sample:	Share of population:
Marginalised consumers	LSM® segment	LSM® 2	9.7%	17.5%[1]
		LSM® 3	26.1%	26.7%[1]
		LSM® 4	64.2%	55.7%[1]
	Age category	Younger than 35	57.3%	53.2%[1]
		35 and older	42.1%	46.8%[1]
	Ethnicity	Black	98.8%	77.9%[2]
		Coloured	0.6%	3.5%[2]
		Indian	0.6%	2.9%[2]
		White		15.7%[2]
Middle-class consumers	LSM® segment	LSM® 5	17.0%	28.6%[1]
		LSM® 6	38.6%	37.9%[1]
		LSM® 7	22.8%	19.2%[1]
		LSM® 8	21.6%	14.4%[1]
	Age category	Younger than 35	42.1%	51.2%[1]
		35 and older	57.9%	48.8%[1]
	Ethnicity	Black	75.4%	77.9%[2]
		Coloured	9.4%	3.5%[2]
		Indian	1.8%	2.9%[2]
		White	12.3%	15.7%[2]
Wealthy consumers	LSM® segment	LSM® 9	52.6%	60.9%[1]
		LSM® 10	47.4%	39.1%[1]
	Age category	15–24	34.5%	43.4%[1]
		25–34	65.5%	56.6%[1]
	Ethnicity	Black	27.3%	77.9%[2]
		Coloured	4.4%	3.5%[2]
		Indian	4.4%	2.9%[2]
		White	63.5%	15.7%[2]

[1] Source: SAARF (2013) based on data from SAARF AMPS 2012.
[2] Source: Statistics South Africa (2012b) Census 2011 Municipal Report Gauteng. ***Please note:*** These values are for Gauteng as a whole and not only for the lower income groups within the province, thus explaining the larger dominance of black consumers in the marginalised consumer sub-segment sample and the dominance of white consumers in the wealthy consumer sample.

consumers by means of fresh red meat product labels. These results were also extracted from a larger research project conducted as an in-store observational product survey with a specific focus on fresh red meat (beef and lamb) labelling claims at major national retailers, chain and independent butcheries, 'factory meat outlets', chain delicatessen ('deli') shops and independent deli shops in selected geographic locations across South Africa, to serve as a sub-sample indicative of what is presented to consumers in South Africa. In September and October 2013 the field work team (final year students at the Department of Consumer Sciences at the University of Pretoria) surveyed a sample of 37 butchers, located in a range of geographical locations in South Africa (e.g. greater Pretoria and Johannesburg areas, Barberton, Bronkhorstspruit, Boksburg, Heidelberg, Hermanus, Kimberley and Secunda). These observations were supplemented with product labelling observations made at large national retail chain outlets. All observations were captured on the survey questionnaire and a Microsoft Office Excel 2007 data capturing sheet. Data analysis involved mainly descriptive statistics.

Results and Discussion

In the consumer survey the respondents were asked whether they had knowledge regarding the grading/classification systems of red meat, how often they checked the grading/classification of meat and also to define red meat classification if possible. These questions pertained only to beef and mutton/lamb and not to chicken and pork, as the main focus of the consumer study was on red meat. These results are summarised in Table 4.

The share of respondents within the different sub-samples perceiving that they have knowledge regarding red meat classification differed significantly (Chi-square = 6.536, df = 2, *P* = 0.038) with a significantly larger share in the wealthier socio-economic sub-group. Perceived knowledge of beef classification among the middle-class group was generally higher for beef than for mutton/lamb, but it should be kept in mind that beef is also more widely consumed than mutton/lamb. However, it should be noted that even among the wealthy segment only about 15% of the particular sample perceived that they have red meat classification knowledge. This underlines the inadequacy of consumer knowledge in this regard even among these consumers who have high general education levels.

Table 4 Consumer knowledge and usage of red meat classification as a percentage of various sub-groups

		Marginalised group (LSM[®] 1–4) (n = 165)	Middle-class group (LSM[®] 5–8) (n = 171)	Wealthy group (LSM[®] 9–10) (n = 249)
Share of sample perceiving that have knowledge regarding red meat classification		4.2% (red meat)	9.9% (beef) 5.8% (mutton/lamb)	14.9% (beef) 12.5% (mutton/lamb)
How often respondents check the classification mark when purchasing red meat	Always	5.4% (red meat)	32.7% (beef) 28.1% (mutton/lamb)	14.1% (beef) 12.6% (mutton/lamb)
	Sometimes	13.6% (red meat)	23.5% (beef) 19.9% (mutton/lamb)	44.0% (beef) 43.9% (mutton/lamb)
	Always or Sometimes	19.0% (red meat)	56.2% (beef) 48.0% (mutton/lamb)	58.1% (beef) 56.5% (mutton/lamb)

LSM[®]: Living Standards Measure.

Only 19.0% of the low LSM[®] sample checks the classification mark when buying red meat, increasing significantly towards the middle-class and the wealthy groups to about 50% and more (Chi-square = 43.828, df = 4, *P* = 0.0) despite the fact that few consumers have knowledge regarding red meat classification. An interesting observation relates to the relatively higher share of middle-class consumers who 'always' checks the classification of red meat (about 30% versus only about 13% for the wealthy segment). It can be argued that the middle-class group possibly purchases food and meat at retail outlets with potentially lower food safety and quality standards, and thus has to rely more heavily on additional quality cues (such as the classification mark) in their meat choices to reduce the risk of buying potentially unsafe food. On the other hand the wealthy segment probably have significant trust in their selected purchase outlets and consequently pay less attention to other quality cues such as the classification of meat because the potential food safety risk associated with the purchase of meat is 'absorbed' by the trusted retail outlets.

The results presented in Table 5 clearly illustrate that very few consumers could explain red meat classification in terms of animal age and fat class, while most responses related it to be a general indication of product quality.

Only about 4% of the marginalised segment associate red meat classification with red meat quality, increasing to 8% of the middle-class group and 11% of the wealthy group. The ranking of 'grading' among the other concepts mentioned by respondents was 5th for the marginalised- and middle-class groups, and 6th for the wealthy segment. For consumers to willingly purchase and consume a particular food type, they must have positive perceptions about the food. In the context of food and particularly meat, it is normally understood that consumer perception of meat relates to its quality in a broad sense. Even though many respondents did not mention red meat classification directly when defining red meat quality, many aspects potentially related to it qualify such as freshness, meat colour, appearance, smell, tenderness, taste and leanness, were mentioned.

When asked to define red meat safety, a larger share of consumers associated red meat classification with red meat safety than with red meat quality. The shares of the various samples associating red meat

Table 5 Consumer understanding of red meat classification (open question responses)

Marginalised group (LSM® 1 - 4)	Middle-class group (LSM® 5 - 8)	Wealthy group (LSM® 9 - 10)
Extremely limited understanding	***Beef classification (16 responses):*** - Indication of quality standard/best quality (60% of responses) - Higher grades more expensive (12%) - Indicated by meat grade stamp (6%)	***Beef classification (25 responses):*** - Indication of quality standard/best quality (45% of responses). - To do with fat on meat (18%) - Different colours for different gradings (11%) - To do with animal age (11%) - Product certification (8%) - There are A and B grades (6%) - First grade is best (5%) - A-AB means animal age and 0–6 means fat classification (3%) - Marbling colour (3%) - Purple stamp is the best meat (3%)
	Mutton/lamb classification (10 responses): - Indication of quality standard/best quality (58% of responses) - Grade A is best quality (24%) - Higher grades more expensive (6%) - Indicated by meat grade stamp (6%) - First grade best (6%)	***Mutton/lamb classification (21 responses):*** - Indication of quality standard/best quality (50% of responses) - There are A and B grades (15%) - Different colours for different gradings (6%) - First grade is best (6%) - To do with fat on meat (6%) - Green or purple stamp mentioned (6%) - To do with animal age (6% - Based on fat and quality (3%) - Product certification (3%) - Higher grades more expensive (3%) - Stamp on meat (3%)

safety with red meat classification were 5% for the marginalised group, 14% for the middle-class group and 19% for the wealthy segment. These results suggest that some consumers associate the classification mark with meat that is safe to eat, which is most probably linked to the 'proper' handling of the meat that is assumed to be associated with classified red meat.

Respondents were asked (in an open-question format) to list their most prominent concerns regarding red meat in general without distinguishing between different grades and cuts. A summary of results is presented in Table 6. The marginalised group focussed mostly on health (45%) followed by affordability (40%) concerns. Interestingly, both the middle-class group and the wealthy consumers focussed mainly on affordability, followed by fattiness and health concerns for both beef and mutton/lamb. Health conscious consumers associate diet with the probability of non-communicable diseases resulting in a shift away from high-fat diets.

Tenderness was a more prominent concern among wealthy beef consumers compared to middle-class beef consumers, and it was not a concern mentioned for mutton/lamb among middle-class and wealthy consumers. It is interesting to observe consumer concerns about fatty meat (middle-class and wealthy groups) and a lack of beef tenderness (wealthy segment) could potentially be improved if they had better knowledge of the red meat classification system which would empower such consumers to make more informed product decisions. From a red meat classification perspective, even though the respondents did not mention red meat classification as a concern, many aspects potentially related to it were identified such as general quality concerns, fatty (also fattiness linked to health concerns), tenderness, meat colour, taste, freshness and smell.

Respondents were asked to define red meat quality in an open-question format. These responses were analysed to determine whether consumers linked the concept of red meat quality with red meat classification (Table 7). Across sub-segments meat colour was an important tangible cue for red meat quality, as well as 'freshness' which seems to be gauged through general product appearance and aspects such as sell-by date. Banovic *et al.* (2012) confirmed the importance of meat colour as a cue to evaluate beef

Table 6 Dominant consumer concerns regarding red meat (open-question responses)* as a percentage of sub-groups

Marginalised group (LSM® 1 - 4)	Middle-class group (LSM® 5 - 8)		Wealthy group (LSM® 9 - 10)	
	Beef concerns	**Mutton/lamb concerns**	**Beef concerns**	**Mutton/lamb concerns**
• Health concerns (45.4%)	• Affordability (17.5%)	• Affordability (24.0%)	• Affordability (35.7%)	• Affordability (55.2%)
• (e.g. fatty, cholesterol, blood pressure, heart problems, diabetes, allergies, gout)	• Fatty (5.8%)	• Fatty (11.7%)	• Fatty (28.5%)	• Fatty (37.1%)
• Affordability (40.2%)	• Health concerns (7.0%)	• Health concerns (4.0%)	• Not tender (13.7%)	• Bad taste (6.0%)
• Long cooking time (2.1%)	• Long cooking time (4.7%)	• Dark colour (1.2%)	• Quality concerns (9.6%)	• Quality concerns (5.6%)
• Availability (1.0%)	• Dark colour (2.3%)	• Long cooking time (0.6%)	• Freshness (7.6%)	• Colour (5.2%)
• General quality concerns (1.0%)	• Not tender (1.8%)	• Not tender (0.6%)	• Long cooking time (5.2%)	• Health concerns (4.0%)
• 'Mixed with strange meat' (1.0%)	• Perishability (1.8%)		• Health concerns (2.4%)	
• Perishable (1.0%)				

*NOTE: the aspects mentioned by the respondents with links to red meat classification are highlighted in grey.
LSM®: Living Standards Measure.

quality. Interestingly, wealthy consumers also associated quality red meat with lean meat. Appearance determines how consumers perceive quality and significantly influences purchasing behaviour. The amount of visible fat is a strong visual cue for consumers. Fat is perceived as negative, as are all aspects associated with fat. Brewer *et al.* (2001) found that highly marbled chops appeared lighter coloured, less lean, had a less acceptable appearance and were less likely to be purchased. Carpenter *et al.* (2001) showed that consumer preference for beef colour was sufficient to influence their likelihood to purchase, but was not enough to bias eating satisfaction at home. Nevertheless, the presentation of fresh red meats with appropriate colour at retail level is of the utmost importance as consumers will discriminate negatively against meat that does not appear to match their expectations.

Flavour, juiciness and succulence together with tenderness are important factors in meat palatability. Marginalised- and middle-class consumers did not mention tenderness as associated with red meat quality, while only 10.8% of the wealthy segment did make this association. This was not expected as it was anticipated that the association between red meat quality and tenderness would be much stronger.

Table 7 Dominant consumer associations with red meat quality (defining red meat quality in an open-question format)* as a percentage of sub-groups

Marginalised group (LSM® 1–4) (n = 165)	Middle-class group (LSM® 5–8) (n = 171)	Wealthy group (LSM® 9–10) (n = 249)
• Freshness (40.0%)	• Meat colour (25.1%)	• Colour red/pink/uniform (40.2%)
• Meat colour red (21.2%)	• Freshness (21.1%)	• Freshness (27.3%)
• Clean meat (12.1%)	• Appearance (19.3%)	• Leanness (16.1%)
• Appearance (4.8%)	• Clean meat (11.1%)	• Smell is good (14.1%)
• Grading (4.2%)	• Grading (8.2%)	• Clean (10.8%)
• Price (3.0%)	• Smell (8.2%)	• Grading (10.8%)
• Nutritional value (1.8%)		• Tenderness (10.8%)
• Shelf life (1.8%)		• Appearance (9.2%)
• Smell (1.8%)		• Good cut (7.2%)
• Tenderness, taste (1.8%)		• Taste (6.0%)

*NOTE: the aspects mentioned by the respondents with links to red meat classification are highlighted in grey.
LSM®: Living Standards Measure.

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instructions, 'Tender' and 'Quality'/'Quality guaranteed'. Other labelling information mentioned in Table 8 as applicable to less than 20% of the sampled butchers, included aspects such as country of origin, expiry date, cooking recommendations, additives added to meat (e.g. MSG, salt, SO_2), 'Lean'/'Extra lean', cooking instructions, recipe, 'Tasty', 'Aged'/'Matured', cooking time, region of origin, 'Fresh', claims indicating specials or value-for-money, red meat classification (animal age and fat class), fat-to-meat ratio, 'Juicy', 'Grain-fed' and allergens listed on label. Thus, the bulk of fresh red meat sold at the observed butchers was more 'generic' with mainly the price and meat cut (and packaging date in many cases) indicated on the product packaging.

Even though the labelling of fresh red meat at some of the national retailers is more sophisticated than at most butchers, a large share of the fresh red meat sold at national retailers is 'generic' with only the store brand, price, meat cut and sell-by date indicated on the product packaging. Labelling information with additional but limited application among the national retail outlets included the following: Claims indicating specials or value-for-money, unique product brand, classification information related to animal age ('A-grade') other date information (e.g. use-by date), 'Lean'/'Extra lean', 'Low fat', 'Tender', 'Tasty', 'Juicy', storage instructions at home, cooking suggestions, serving suggestions, 'Aged'/'Matured', 'Deboned' and flavour added (e.g. marinade, spices).

It is evident that observations related to fresh red meat classification were insignificant (applicable to fewer than 5% of butchers). Selected brands offered by large retailers indicated more advanced labelling information (such as free range, region of origin, feeding practices, animal welfare), but extremely limited labelling information regarding red meat classification was observed with only limited observations of terms such as 'A-grade' indicated on some more up-market red meat cuts. Further investigation is needed to determine whether the limited application of labelling claims is related to a lack of product innovation in the

Table 9 The top 20 considerations (in order of importance) for different socio-economic sub-groups when purchasing raw mutton/lamb (marginalised group) and mutton/lamb chops (middle-class- and wealthy groups)*

Marginalised group (LSM® 1–4) (n = 165)	Middle-class group (LSM® 5–8) (n = 171)	Wealthy group (LSM® 9–10) (n = 249)
Price	Price	Food safety
Meat colour	Appearance	Expiry date
Appearance	Expiry date	Taste
Easy to prepare	Taste	Meat colour
Clean meat (e.g. no blood)	Food safety	Appearance
Tenderness	Flavour	Flavour
Amount of meat per package	Meat colour	Price
Quality guarantee	Clean meat	Clean meat
Bone-to-meat ratio	Quality guarantee	Visual appeal
Expiry date	Juiciness	Tenderness
Convenience	Store where you buy meat	Quality guarantee
Fat colour	Easy to prepare	Eaten by all in family
Fat-to-meat-ratio	Tenderness	Amount of fat
Packaging size	Eaten by all in family	Keepability
Fresh (not frozen)	Amount of fat	Juiciness
Eaten by all in family	Freshness	Nutritional value
Juiciness	Lean/low fat meat	Store where you buy meat
Taste	Brand Product Reputation	Natural
Preparation time	Packaging size	Freshness
Packaging	Convenience	Personal preferences

NOTE: the aspects mentioned by the respondents with potential links to red meat classification are highlighted in grey.
LSM®: Living Standards Measure.

industry or whether retailers do not wish to make statements on their product labels which may be viewed as contentious of the recently updated Food Labelling Regulations (R429, of 29 May 2014).

Table 10 Summary of fresh red meat labelling claims observed at independent butchers

Claim:	Claim category:	Share of butchers (n = 37):
Price per kg; Price per package	Product pricing	100%
Store brand	Branding	100%
Meat cut	Cut	100%
Packaging date	Date information	92%
Distinguishing between mutton and lamb	Classification (only applicable to mutton/lamb)	43%
Unique product brand	Branding	32%
Sell-by date	Date information	32%
Home storage instructions	Post-purchase handling	24%
'Tender'	Palatability claims	22%
'Quality'/Quality guaranteed	Quality	22%
Flavour added (e.g. marinade, spices)	Palatability claims	30%
Country of origin	Origin	16%
Expiry date	Date information	14%
Cooking recommendations	Post-purchase handling instructions	14%
Additives such as MSG, salt, SO_2 listed on packaging	Additives	14%
Lean (mince)	Fat related claims	11%
Cooking instructions/recipe	Post-purchase handling	11%
'Tasty'	Palatability claims	8%
Aged/matured	Post-slaughter handling	8%
Cooking time	Post-purchase handling	≤5%
Region of origin	Origin	≤5%
'Fresh'	Palatability claims	≤5%
Claims indicating specials or value-for-money	Affordability	≤5%
Classification (animal age and fat class)	Classification	≤5%
Fat-to-meat ratio	Fat related claims	≤5%
'Juicy'	Palatability claims	≤5%
Grain-fed beef	Production practices	≤5%
Allergens listed on label	Allergens	≤5%

Conclusions and Recommendations

The poor consumer segment had very limited understanding and gave little attention to red meat classification. Although middle-class and wealthy consumers also had a limited understanding of red meat classification, about half of the sampled consumers checked the red meat classification sometimes or often when buying beef or mutton/lamb.

Among red meat problems or concerns perceived by consumers, red meat classification was not prominent. However, many aspects potentially related to classification were of concern such as general quality concerns, fattiness (also fattiness linked to health concerns), tenderness, meat colour, taste, freshness and smell.

Many respondents did not mention red meat classification when defining red meat quality and safety, but many aspects potentially related to classification were mentioned such as freshness, meat colour, appearance, smell, tenderness, taste and leanness. There was little association between red meat grading

and red meat quality and safety. Only 5% of the low LSM® sample associated grading with red meat quality and safety. Among the middle-class and wealthy consumers up to 11% of consumers associated red meat classification with quality and up to 19% of consumers associated it with safety. These associations were stronger among the higher LSM® consumers. Thus, the results indicated a slightly stronger association between red meat grading and safety compared to quality.

Among an extensive range of red meat decision factors, red meat classification was not among the top 20 most important factors. Once again, many aspects potentially related to red meat classification were important such as appearance, taste, flavour, quality guarantee, meat colour, fat content, juiciness and tenderness. It is interesting to note that the place of purchase is a stronger quality cue to consumers than the classification marks on the meat. This is an important observation and could be further investigated in future.

There is a definite need for comprehensive consumer education about the red meat classification system and its implications in terms of product characteristics and quality. The pork industry in the United States of America (USA) has portrayed pork as a light and nutritious alternative to chicken with the 'Pork: the other white meat' advertising campaign launched in 1997 which focussed on leaner cuts with a lower fat content. Research indicates that consumers are now less likely to perceive pork negatively in terms of fat (Resurreccion, 2003). Enhanced knowledge could assist consumers to make more informed decisions and to utilise the red meat carcass classification system as a useful tool. However, given the potential loss of product identity which occurs at the point in the supply chain where carcasses are processed into individual meat cuts, it is critical that fresh red meat product labels should have trustworthy and clear indications of the class of the meat being sold. This research illustrated that the current application of classification information displayed on fresh red meat labels is extremely limited. There is a definite need for the development and consumer testing of an appropriate front-of-pack labelling system to communicate red meat classification to consumer by means of product labels.

Acknowledgements

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