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South African consumers' willingness to pay a premium for Karoo Lamb: The influence of subjective and objective knowledge, label information and demographics☆

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ABSTRACT

In South Africa, Karoo Lamb is a prestigious product associated with free range production. This study examined the influence of subjective and objective Karoo Lamb knowledge, the importance of label information, and demographics on consumers' willingness to pay a premium for Karoo Lamb products. A panel of 355 consumers who had previously purchased lamb/mutton products completed an online questionnaire. The importance of Karoo Lamb label information, subjective Karoo Lamb knowledge and population group had a significant positive impact on willingness to pay a premium for Karoo Lamb. Objective Karoo Lamb knowledge and other demographics did not have a significant impact.

1. Introduction

In South Africa, Karoo Lamb has become a prestigious product associated with the principle of free range production. Karoo Lamb is reared on Karoo vegetation – a blend of diverse species of wild herbs – adding to the unique taste of Karoo Lamb products (Erasmus, 2017:201; Erasmus et al., 2016; Erasmus et al., 2017). The Karoo Meat of Origin certification trademark guarantees Karoo meat's origin, with only lamb and mutton originating from the Karoo, qualifying for certification. As most (more than 75%) of all sheep slaughtered and marketed in the Karoo are lamb, we will only refer here to lamb, which is known in the trade as Karoo Lamb and also currently being considered as South Africa's first registered geographical indication (GI) – "Karoo Lamb". The production practices for Karoo Lamb are straightforward, and apart from the fact that farms should be located in the Karoo region as defined and practice free range grazing on natural veld (no planted pastures and no feedlots), it is also expected that all Karoo farmers should practice good agricultural practices. The Karoo Meat of Origin protocol and production standard (www.karoomeatoforigin.com) specify elements of these husbandry practices, e.g. "sizeable camps" and "clean drinking water" and "no routine antibiotics and hormones". Good agricultural practices also relate to the handling, transport and slaughtering of animals. The certification mark (and the proposed GI) thus guarantees Karoo Lamb to be free range, fully traceable to accredited farms, free from added hormones, and free from routine antibiotics (Kirsten et al., 2017). The "Karoo concept" denotes "quality, tradition, and wholesomeness" (Kirsten et al., 2012, p.2).

Consumers' interpretation of food label information potentially has a direct bearing on their decision-making (Kempen et al., 2011) and may influence their purchasing behaviour differently. For example, Du Plessis and Du Rand (2012) found that price as an extrinsic product attribute was the most important factor in consumers' Karoo Lamb purchasing decisions, followed by safety, quality and traceability, and the attribute of "region of origin" being the least important. In contrast, Font-i-Furnols et al. (2011) concluded from a conjoint study in Spain, France, and the United Kingdom that lamb's origin was the most important factor in determining consumers' purchasing intention, followed by the type of feeding system and next, price. Given these studies' contradictory findings, it is clear that the importance attached to specific extrinsic product attributes influences consumers' willingness to pay a premium for lamb products.

"Researchers posit that consumers' perception of their knowledge,

☆ This paper is based on the Master's dissertation by H.J. Wilken-Jonker on consumers' knowledge of selected claims associated with fresh lamb or mutton products.

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explains their information search process and how they interpret product information and, ultimately, the products they end up buying" (Qian, 2017, p. 189). To date, no studies have explored consumers' subjective and objective knowledge of the production processes associated with Karoo Lamb – implying a gap in available research (Wilken-Jonker, 2018). Given the increase in the demand for red meat associated with increased consumer sophistication and changing lifestyles as the South African middle class is growing (Labuschagne et al., 2011; Vermeulen et al., 2015; Webb, 2013, Wilken-Jonker, 2018:20), studies on consumers' knowledge of Karoo Lamb production process claims and the importance of extrinsic product attributes become pertinent. Also, exploring the relationships between demographics and consumer knowledge and between demographics and the importance of Karoo Lamb label information could reveal meaningful insights for salespeople at food retailers, brand administrators and wholesale merchants to consider. The paper aimed to quantify the importance of subjective and objective knowledge and Karoo Lamb label information on the brand image for Karoo Lamb. The study also assessed the relative importance of subjective and objective knowledge and Karoo Lamb label information on willingness to pay a premium for lamb products originating from the famous Karoo region of South Africa. From a marketing and policy perspective, we derived implications for information provision and suggested target groups that can be addressed through distinct marketing strategies.

2. Methodology

2.1. Respondents

The Faculty of Natural and Agricultural Sciences Research Ethics Committee at the University of Pretoria approved the research project involving human participants (reference number EC160413-0151) before the data collection commencement. This cross-sectional survey design involved a self-administered online questionnaire. This study's unit of analysis was consumers aged 18 years and older who resided in major urban areas across South Africa, irrespective of their gender or race. Also, for inclusion in the study, respondents had to purchase pre-packaged fresh lamb/mutton at least once a month at food retailers, including supermarkets and hypermarkets, selling most fresh meat in South Africa (Trends in South African Meat Market, 2015).

A reputable online panel survey company recruited respondents using convenience sampling in major urban areas across South Africa, representing a cross-section of the South African public. Of the 1200 panel members who responded, only 355 (29.5%) responses were useable for further analysis. The 845 excluded panel members either did not complete the questionnaire in full or did not purchase pre-packaged lamb/mutton from food retailers. The sample consisted of a diverse group of people. Table 1 shows the sample description. Most of the respondents (37.5%) resided in the City of Johannesburg, followed by 20% in Tshwane, and 14.3% in Ekurhuleni, all three major metropolitan areas of Gauteng Province, the economic hub of South Africa. A total of 8.2% of the respondents chose the "other" response option, while 20% did not indicate where they resided.

Table 1
Demographic characteristics of the sample (n = 355).

Variable	Percentage
Gender	
Male	55.5
Female	44.5
Age	
18–35 years (Millennials)	16.9
36-55 (middle-aged consumers)	50.9
>56 years (mature consumers)	32.2
Level of education	
Secondary schooling	24.4
Additional diploma(s)/certificate(s)/undergraduate degree(s)	43.5
Graduate qualification	32.1
Monthly household income	
R6 000 – R16 000 (Middle income)	16.0
R16 001 – R40 000 (Upper middle income)	39.0
> R40 000 (Elite income)	45.0
Population group	
Black	22.2
Coloured	2.8
Indian	3.7
White	68.5
Other	2.8
Municipal area	
City of Johannesburg	37.5
Ekurhuleni (Germiston)	14.3
Tshwane (Pretoria)	20.0
Other	8.2
Chose not to answer	20.0

2.2. Measuring instrument

This study used a multi-sectioned, structured online questionnaire that consisted of five sections. Two screening questions safeguarded that only respondents who purchased pre-packaged lamb/mutton at least once a month at food retailers were included in the study. *Section A* measured how frequently and at which retailers respondents purchased fresh pre-packaged lamb/mutton and how often they read meat labels.

Section B measured respondents' subjective knowledge of selected production process claims on the labels or packaging of pre-packaged lamb/mutton products, namely, free range, antibiotic free, no hormones added and Karoo Lamb, on a 5-point Likert-type scale with five items, anchored with 1 ("Strongly disagree") and 5 ("Strongly agree"). The five subjective knowledge items for each knowledge test were based on Flynn and Goldsmith's (1999) subjective knowledge test. The items for the Karoo Lamb subjective knowledge test were: 'I know what Karoo Lamb means', 'I do not feel very knowledgeable about Karoo Lamb', 'Among my circle of friends I am the expert on Karoo Lamb', 'Compared to most other people, I know the less about Karoo Lamb', and 'When it comes to Karoo Lamb, I really do not know a lot'.

Section C measured the respondents' objective knowledge of selected production process claims on the labels/packaging of pre-packaged lamb/mutton products, including free range, antibiotic free, no hormones added, and Karoo Lamb. Respondents had to mark true/false for each of the statements per production process. These items were self-developed based on literature about the specific claims, including Certified Karoo Meat of Origin (www.karoomeatoforigin.com) and SAMIC (2015). The items for the objective Karoo Lamb knowledge test were: 'The term Karoo Lamb means': 'The animal was raised in the Karoo', 'The animal was not allowed to roam freely', 'The animal was given routine antibiotics', 'The animal was fed in a feedlot (a confined area where animals are fed mainly grain to reach a certain target weight) before slaughter', and 'The animal grazed on specific Karoo bushes, contributing to the unique taste of Karoo Lamb'.

Section D measured the importance associated with selected extrinsic product attributes based on label information with a 5-point Likert-type scale, anchored with 1 ("Not at all important") and 5 ("Extremely important"). These attributes included price, unit price (R/kg), sell-by date, use-by date, selected production process claims, i.e. no hormones added, free range, antibiotic free, Karoo Lamb, and country of origin (Wilken-Jonker, 2018). Respondents were also asked to indicate how confident they were about the trustworthiness of specific label information on pre-packaged lamb/mutton; the responses were anchored with 1 ("Not confident at all") and 5 ("Very confident"). Respondents also had to indicate whether they were willing to pay a premium for pre-packaged lamb/mutton if the animal roamed freely, was never given hormones, was never given routine antibiotics, or was raised in the Karoo region in separate questions. A 5-point Likert-type agreement scale anchored with 1 ("Strongly disagree") and 5 ("Strongly agree") was used for each item. Therefore, willingness to pay a premium was not

measured in the traditional sense where the data relates to the product's relative price (Hurter, 2018; Van Zyl, 2011; Van Zyl et al., 2013). Instead, willingness to pay a premium was measured in the respondents' likelihood of paying an unspecified premium for the Karoo Lamb product.

Section E measured respondents' demographic information, namely gender, age, monthly household income, education level, municipal area, and population group.

Although various constructs were measured, this article reports only on the factors influencing consumers' willingness to pay a premium for fresh Karoo Lamb products. The findings on consumers' knowledge of the other production processes and their relation to demographics and willingness to pay a premium for lamb/mutton with specific claims will be reported in subsequent articles.

2.3. Data collection

The online panel survey company recruited respondents after pretesting the questionnaire on five online panel members to identify ambiguous wording and online questionnaire design problems that could result in misinterpretation. The panel members who participated in the final online questionnaire were invited by email to click on the link provided. A cover letter explained the reasons for the research, why it is important to participate, and the time required to complete the questionnaire. Respondents provided informed consent by clicking on the link to participate. Upon completion of the questionnaire, the respondents were thanked for their insight and participation. The individual respondents could view the answers to the true/false questions by clicking on the link provided to increase participation.

2.4. Data analysis

The researchers analyzed the anonymous database and could therefore not link the respondents to the responses. Descriptive statistics, including frequencies and means, summarised the subjective and objective Karoo Lamb knowledge tests' results. The respondent's subjective Karoo Lamb knowledge score was calculated as a mean of the five items. The internal reliability of the items for the subjective knowledge test was determined through Cronbach's coefficient alpha with a cut-off value above 0.70 that is generally considered acceptable (Anastasi and Urbina, 1997:91). The objective knowledge score per respondent was calculated based on the number of correct answers. The relationship between knowledge (subjective and objective Karoo Lamb knowledge) (dependent variables) and demographic characteristics (independent variables) was assessed using Kruskal-Wallis (K–W) one-way analysis of variance (ANOVA) tests. Mann-Whitney post-hoc tests were performed to determine which groups were different from others. A Spearman correlation coefficient was computed to assess the relationship between subjective and objective Karoo Lamb knowledge. The mean importance scores for information printed on the label or packaging of pre-packaged fresh lamb/mutton is presented. The relationship between the importance rating of Karoo Lamb label information and demographic attributes was assessed using Kruskal-Wallis tests. Ordinal logistic regression was performed to fit a regression model with willingness to pay a premium for Karoo Lamb (an ordinal measure with five categories) as the dependent variable and the importance of Karoo Lamb label information, subjective Karoo Lamb knowledge and objective Karoo Lamb knowledge, and demographics as independent variables. The model was fitted by calculating the five categories' frequencies and the five categories' cumulative frequencies. The cumulative frequencies were then transformed into Odds by:

$$Odds = \frac{p}{1-p}$$

The log odds was then calculated and used as the dependent variable in a linear regression with the importance of Karoo Lamb label information and subjective and objective knowledge as independent variables to yield an estimated Log Odds as output. Next, the estimated Log Odds was transformed into estimated Odds by computing the antilogarithm (EXP). The estimated odds was transformed back to cumulative probabilities using:

$$p = \frac{Odds}{1+Odds}$$

The cumulative probabilities were transformed into probabilities by subtraction. The result presents the estimated probability that an individual consumer will fall into each of the five willingness categories.

3. Findings and discussion

3.1. Consumers' subjective and objective knowledge about Karoo Lamb

Table 2 shows the respondents' level of agreement (as a percentage) with items about their subjective knowledge of Karoo Lamb.

The majority of the respondents (73%) agreed or strongly agreed that they knew the meaning of "Karoo Lamb", while 59% indicated that they did not feel knowledgeable about "Karoo Lamb". Fewer than half (47%) of the respondents disagreed with being the expert on "Karoo Lamb", with 34% of the respondents being undecided. A total of 54% of the respondents indicated that they knew less about Karoo Lamb than other people, with 29% of the respondents being undecided. More than half of the respondents (53%) disagreed to strongly disagreed that they really knew a lot about Karoo Lamb. Overall, the respondents had a reasonable level of subjective Karoo Lamb knowledge (overall mean = 3.4 out of 5), suggesting that they were reasonably confident about their subjective knowledge. The five items for Karoo Lamb showed good internal consistency (Cronbach's coefficient alpha = 0.81), confirming the usability of Flynn and Goldsmith's (1999) standardized scale to measure subjective knowledge.

The objective knowledge test responses, including the mean score (percentage of correct answers), are presented in Table 3. The scores of correct answers are bolded.

As shown in Table 3, almost all of the respondents knew that the animal was raised in the Karoo region and grazed on specific Karoo

Table 2
Respondents' level of subjective Karoo Lamb knowledge (n = 355).

Subjective Karoo Lamb knowledge items	Level of agreement Percentage				
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I know what Karoo Lamb means	11	1	11	27	46
*I do not feel very knowledgeable about Karoo Lamb	36	23	18	10	13
Among my circle of friends, I am the expert on Karoo Lamb	27	20	34	12	7
*Compared to most other people, I know less about Karoo Lamb	28	26	29	7	10
When it comes to Karoo Lamb, I really know a lot	30	23	21	12	14
Overall mean = 3.4 out of 5 (68%), Cronbach's coefficient alpha = 0.81					

Subjective Karoo Lamb knowledge score: A low score (i.e. 1–2.5 out of 5) (≤50%) indicates a low level of subjective knowledge. A score of 2.55–3.74 out of 5 (50.1%–74.9%) indicates a reasonable level of subjective knowledge. A high score (i.e. ≥ 3.75 out of 5) (≥75%) indicates a high level of subjective knowledge.
Note: * Reversed items.

Table 3
Results of objective Karoo Lamb knowledge test (n = 355).

Objective Karoo Lamb knowledge items	Percentage True	False
The animal was raised in the Karoo	**94**	6
The animal was not allowed to roam freely	**9**	**91**
The animal was given routine antibiotics	19	**81**
The animal was fed in a feedlot (a confined area where animals are fed mainly grain to reach a certain target weight) before slaughter	16	**84**
The animal grazed on specific Karoo bushes, contributing to the unique taste of Karoo Lamb	**89**	11

The mean score (percentage correct answers) for the objective knowledge test = 4.38 out of 5 (88%).
Objective Karoo Lamb knowledge score: A score ≤ 50% indicates a low level of objective knowledge. A score between 50% and 75% indicates a reasonable level of objective knowledge. A score ≥75% indicates a high level of objective knowledge.

bushes, contributing to its unique taste. The majority of the respondents knew that the animal was allowed to roam freely, was not given routine antibiotics and was not fed in a feedlot. The mean score (88%) indicates a high level of objective knowledge. Almost all of the respondents provided the correct answers, pointing to consistency in answering the true/false questions. Since the answers to the objective knowledge questions were binary, measuring knowledge rather than opinions, internal consistency measured by Cronbach's alpha is not applicable. The high level of objective knowledge in itself is compelling from a marketing and branding perspective. It confirms the argument that Karoo Lamb has a strong reputation and a strong and persuasive message engrained in the name "Karoo Lamb".

To facilitate more self-confidence and better coping with product-related experiences, consumers' subjective Karoo Lamb knowledge should be increased through advertising exposure, information search, interactions with salespeople, decision-making, purchasing, and product usage (Alba and Hutchinson, 1987; Wilken-Jonker, 2018). Alba and Hutchinson (2000) explain that objective knowledge has to do with the accuracy of knowledge, implying that individuals with a high level of objective knowledge on a topic will give the correct answers to questions about that topic. Objective knowledge reduces the cognitive effort required in decision-making and improves "a consumer's ability to analyze and recall product information" (Alba and Hutchinson, 1987; Vigar-Ellis et al., 2015; Wilken-Jonker, 2018).

3.2. Relationship between knowledge (subjective and objective Karoo Lamb knowledge) and demographic characteristics

Table 4 shows the K–W one-way distribution free ANOVA tests to compare the mean scores for the subjective and Karoo Lamb knowledge test across demographic characteristics.

The Kruskal-Wallis tests showed statistically significant differences in the subjective Karoo Lamb knowledge score by education level ($H(2) = 8.916$, $p = 0.012$), by income group ($H(2) = 15.088$, $p = 0.001$), and by population group ($H(1) = 49.289$, $p < 0.001$). The subjective knowledge score did not differ by gender or age group. Interestingly, the objective Karoo Lamb knowledge score differed only by population group ($H(1) = 10.707$, $p = 0.001$) (see Table 4).

Respondents with a graduate qualification (188.9) or a diploma/under-grad degree (183.1) had a higher mean rank subjective knowledge score than those with secondary schooling (148.4). Therefore, it appears that a higher level of education can be associated with a higher level of subjective knowledge. Previous research confirmed that a higher education level could be linked to a higher level of subjective and objective product knowledge. For example, House et al. (2004) found that respondents with a college education had significantly higher subjective and objective knowledge about genetically modified foods. Forbes et al. (2008) and Robson et al. (2014) have found that higher objective knowledge about wine was significantly linked to higher education, confirming that a higher level of education can be associated with a higher level of objective knowledge about specific products. However, in the current study, objective Karoo Lamb knowledge could not be linked to education level.

The Elite income group had a higher mean rank subjective knowledge score (181.5) than the middle income (143.2) and upper-middle-income groups (140.8). A higher level of income can, therefore, be associated with a higher level of subjective knowledge. Ellen (1994) examined the relationship between knowledge, pro-ecological attitudes, and behaviours and found that higher income is significantly and positively related to both subjective and objective knowledge. However, one should note that Ellen's study involved a different knowledge domain-specific topic and was conducted in a US context.

White respondent had a mean rank subjective knowledge score of 182.2 and Black respondents of 97.8. Black respondents' lower level of subjective knowledge could imply that they were less self-confident about their subjective Karoo Lamb knowledge than White respondents. White respondents also had a higher mean rank objective knowledge score (170.1) than Black respondents (135.1). White respondents' higher level of objective knowledge could be due to higher factual knowledge levels and more exposure to lamb meat. These

Table 4
Differences in the subjective and objective Karoo Lamb knowledge scores across demographic characteristics.

Demographic characteristics		n	Karoo Lamb knowledge					
			Subjective knowledge score			Objective knowledge score		
			Mean rank	*df*	*p*-value K–W one-way ANOVA	Mean rank	*df*	*p*-value K–W one-way ANOVA
Gender	Male	197	184.77	1	0.164	172.83	1	0.231
	Female	158	169.55			184.44		
Age	Millennials	60	182.6	2	0.922	165.6	2	0.506
	Middle-aged consumers	181	177.7			180.9		
	Mature consumers	114	176.0			179.9		
Highest level of education	Secondary schooling	86	148.4[a]	2	0.012*	166.1	2	0.280
	Diploma/under-grad degree	153	183.1[b]			175.1		
	Graduate qualification	113	188.9[b]			186.4		
Monthly household income	Middle income	51	143.2[a]	2	0.001**	151.41	2	0.379
	Upper middle income	124	140.8[a]			154.81		
	Elite income	143	181.5[b]			166.45		
Population group	Black	79	97.8	1	0.000***	135.1	1	0.001**
	White	243	182.2			170.1		

Note: * Significant at the 5% level, ** Significant at the 10% level, *** Significant at 1% level. Mean ranks with different superscripts differ significantly on the 5% level, Mann-Whitney post hoc tests.

findings imply that the Black respondents are untapped because of a lack of information.

Considering the differences in subjective and objective knowledge across specific demographic groups, food retailers and marketers should use appropriate promotional messages to promote Karoo Lamb knowledge to the respective groups.

3.3. Relationship between subjective and objective Karoo Lamb knowledge

A Spearman correlation coefficient was computed to assess the relationship between subjective and objective Karoo Lamb knowledge. Overall, there was a weak, positive correlation between subjective and objective knowledge ($r = .181$, $r^2 = 0.033$, $n = 355$), although significant with a p-value of 0.001. The relationship, therefore, has very little predictive value. This finding confirms that "subjective and objective knowledge are distinct and weakly correlated" (Wei et al., 2018).

3.4. Respondents' consideration of the importance of specific extrinsic product attributes

Fig. 1 shows the mean importance scores and standard deviations for the information printed on labels or packaging of pre-packaged lamb/mutton.

Fig. 1 shows sell-by date, use-by date, price per kg and price had the highest mean scores (means = 4.7), meaning that information about these four attributes was very to extremely important to respondents. Price is known to be one of the most important and determining factors in the consumer's decision-making process and is generally seen as a quality cue (Chocarro et al., 2009). A higher price can sometimes symbolize better quality or safety for the consumers (Du Plessis and Du Rand, 2012). When comparing two similar products, the higher-priced alternative is usually expected to be of better quality (Chocarro et al., 2009). The sell-by and use-by dates are generally considered cues of freshness, safety, and quality (Du Plessis and Du Rand, 2012), and are dominant purchasing considerations of middle- and high-income consumers (Vermeulen et al., 2015). The respondents also regarded antibiotic free and free range as extremely important, though both means (3.8) were slightly lower than those of the top four important attributes. Antibiotic free and free range relates to the production processes used and could also signify consumer safety. Meat products are often viewed with negativity, precisely due to meat consumption being associated with certain risks to human health, including chemical residues of growth hormones and antibiotics (Du Plessis and Du Rand, 2012). Alternatively, production process claims could be relevant to price-sensitive consumers as they generally associate claims such as free range with higher prices. The respondents regarded no added hormones, country of origin, and Karoo Lamb as moderately important (means varied between 3.4 and 3.7). According to Du Plessis and Du Rand (2012), origin – whether the country of origin or geographic origin – can be regarded a quality cue.

The current study's results show that the respondents were not as concerned about the production process claims as they were about price and date information provided on lamb/mutton product labels. Bernués et al. (2003) found that European consumers considered the origin/-region of production and the deadline (consume by) information for beef and lamb the most important informational cues to appear on the label. Cues regarding the production processes, traceability of animals and products, and the industry's quality controls (quality assurance systems) were also highly relevant. When comparing the results of the two studies, it is clear that South African consumers are not as production process conscious as European consumers, who are generally concerned about the impact of intensive rearing methods on the environment, animal welfare and the safety of food products (Bernués et al., 2003).

3.5. Relationship between the importance of Karoo Lamb label information and demographic characteristics

Table 5 shows the K–W one-way ANOVA tests to compare the mean score for the importance of Karoo Lamb label information across demographic characteristics.

The Kruskal-Wallis test showed a statistically significant difference in the importance of Karoo Lamb label information between the population groups ($H(1) = 10.726$, $p = 0.001$), with a mean rank importance score of 170.9 for White respondents and 132.6 for black respondents. Therefore, Black respondents considered Karoo Lamb label information less important. As Karoo Lamb is a credence attribute, consumers need to evaluate the credibility of the information transmitted by the media or word-of-mouth to form quality expectations before purchasing products (Becker, 2000). Therefore, these consumer socialization agents' role should not be underestimated in creating awareness of specific external product attributes or evaluative criteria, including Karoo Lamb information cues.

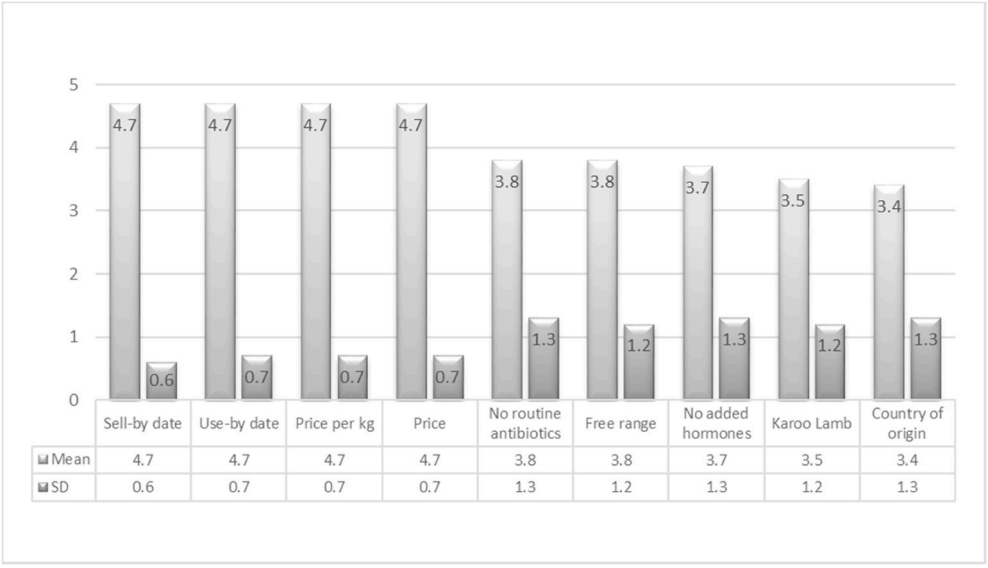

Fig. 1. Means and standard deviations of importance items (n = 355).

Table 5
Difference in the importance of Karoo lab/mutton label information score across demographic characteristics.

Demographic characteristics		n	Importance of Karoo Lamb label information score		
			Mean rank	*df*	*p*-value K–W one-way ANOVA
Gender	Male	197	172.88	1	0.279
	Female	158	184.39		
Age	Millennials	60	183.8	2	0.538
	Middle-aged consumers	181	181.4		
	Mature consumers	114	169.5		
Highest level of education	Secondary schooling	86	181.4	2	0.073
	Diploma/under-grad degree	153	186.5		
	Graduate qualification	113	159.2		
Monthly household income	Middle income	51	169.6	2	0.283
	Upper middle income	124	165.3		
	Elite income	143	150.9		
Population group	Black	79	132.6	1	0.001**
	White	243	170.9		

Note: * Significant at the 5% level, ** Significant at the 10% level, *** Significant at 1% level.

3.6. Ordinal logistic regression of willingness to pay a premium for Karoo Lamb on the importance of Karoo Lamb label information, subjective and objective Karoo Lamb knowledge, and demographics

Respondents were asked to rate their willingness to pay a premium for pre-packaged lamb/mutton if the animal was raised in the Karoo region on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Only 40% of the 355 respondents agreed that they would pay a premium for Karoo Lamb, while 31% were undecided, and 29% would not pay a premium. The relatively low willingness to pay a premium for Karoo Lamb in the current study compares well with Kirsten et al.'s (2012) survey study investigating Karoo Lamb's reputation through consumers' awareness and perceptions of the product. They found that only 27% of consumers aware of Karoo Lamb were willing to pay a premium for Karoo Lamb than regular lamb/mutton. In a different study, employing an experimental auction to determine South African consumers' willingness to pay a premium for certified Karoo Lamb, almost 58% of the sample indicated that they would do that. Although the findings from the studies mentioned above differ, one should bear in mind that the researchers employed different methodologies, emphasizing that the conclusions drawn from consumer studies could be framed by the methods used (Kirsten et al., 2017).

Ordinal logistic regression was used to fit a regression model with willingness to pay a premium for Karoo Lamb as the dependent variable and the importance of Karoo Lamb label information, subjective Karoo Lamb knowledge and objective Karoo Lamb knowledge, and demographics as independent variables. The full model containing all predictors was statistically significant, $\chi 2\ (11) = 109.702$, $p < 0.001$, implying a significant improvement in the fit of the final (ordered) model over the intercept only (or null) model. Therefore, the final model explained a significant share of the variability in the data. Table 6 shows the outcome of the ordinal logistic regression model of willingness to pay a premium for Karoo Lamb on the importance of Karoo Lamb label information and subjective and objective Karoo Lamb knowledge scores.

The effects of the importance of Karoo Lamb label information, subjective Karoo Lamb knowledge and population group on willingness to pay a premium were significant ($p < 0.05$). The importance consumers attached to the Karoo Lamb label information was the strongest driver of willingness to pay a premium ($p < 0.001$), followed by population group ($p = 0.006$) and subjective knowledge ($p = 0.01$). However, the effects of objective Karoo Lamb knowledge and the remainder of the demographics were not significant ($p > 0.05$) (see Table 6).

Table 6
Parameter estimates for willingness to pay a premium for Karoo Lamb on the importance of Karoo Lamb label information, subjective and objective Karoo Lamb knowledge, and demographics.

		Estimate	Std. Error	Wald	*df*	Sig.
Threshold	[Willingness = 1]	2.115	0.760	7.744	1	0.005
	[Willingness = 2]	3.127	0.768	16.575	1	0.000
	[Wilingness = 3]	4.862	0.799	37.036	1	0.000
	[Willingness = 4]	6.520	0.832	61.369	1	0.000
Location	Importance of Karoo Lamb label information	0.960	0.109	77.951	1	0.000
	Subjective Karoo Lamb knowledge score	0.017	0.006	6.692	1	0.010
	Objective Karoo Lamb score	−0.045	0.128	0.125	1	0.724
	[Gender = Female]	−0.055	0.223	0.060	1	0.806
	[Gender = Male]	0[a]			0	
	[Age = Millennials]	0.231	0.338	0.469	1	0.493
	[Age = Middle-aged consumers]	−0.053	0.240	0.049	1	0.825
	[Age = Mature consumers]	0[a]			0	
	[Education = Secondary schooling]	−0.112	0.335	0.112	1	0.738
	[Education = Diploma/under-grad degree]	−0.057	0.268	0.045	1	0.832
	[Education = Graduate qualification]	0[a]			0	
	[Population group = African]	0.806	0.291	7.673	1	0.006
	[Population group = White]	0[a]			0	
	[Income = Middle]	−0.197	0.358	0.302	1	0.583
	[Income = Upper middle]	−0.103	0.266	0.149	1	0.699
	[Income = Elite]	0[a]			0	

Link function: Logit.
[a] This parameter is set to zero because it is redundant.

White respondents were more willing to pay a premium for Karoo Lamb than Black respondents. The probabilities of the five willingness categories were plotted against the importance of Karoo Lamb label information and against subjective Karoo Lamb knowledge to illustrate the outcome of the analysis. The first two categories of willingness to pay a premium (strongly disagree and disagree) were collapsed; likewise, the last two categories (agree and strongly agree) were collapsed to simplify the interpretation. Fig. 2 shows the probability of willingness to pay a premium plotted against the importance of the Karoo Lamb label information.

Fig. 2 shows that if the Karoo Lamb label information was unimportant to a consumer (importance = 1 or 2), the consumer was most likely to disagree to paying a premium for Karoo Lamb. This probability became very small if the importance score was high (4 or 5). The probability that the consumer would agree to pay a premium for Karoo Lamb was low if the importance of Karoo Lamb label information was low (1 or 2) and increased rapidly as the importance score increased to 4 or 5. This finding indicates that it would pay to educate consumers on the importance of Karoo Lamb label information.

Fig. 3 shows the estimated probabilities of willingness to pay a premium plotted against subjective Karoo Lamb knowledge.

Consumers with a low level of subjective Karoo Lamb knowledge

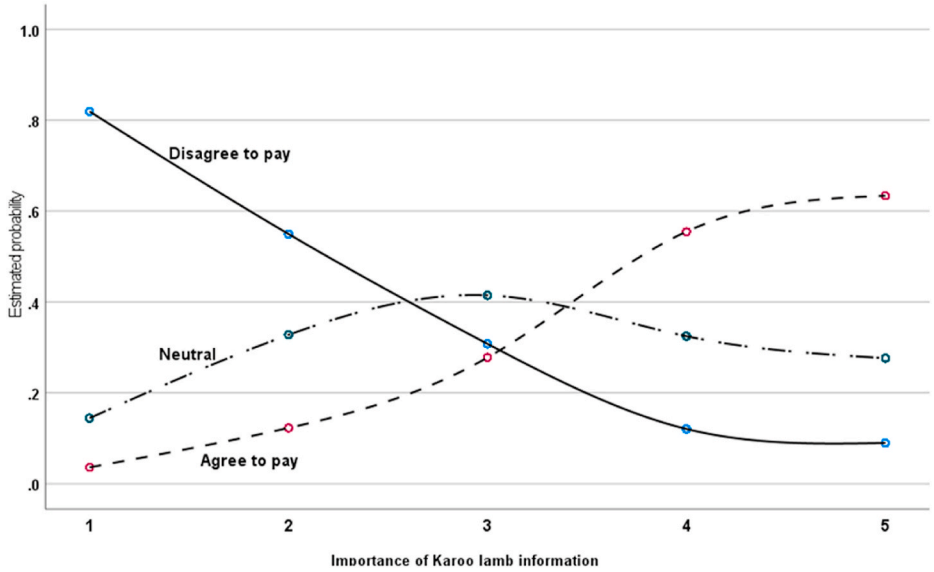

Fig. 2. Probability of willingness to pay a premium plotted against the importance of the Karoo Lamb label information.

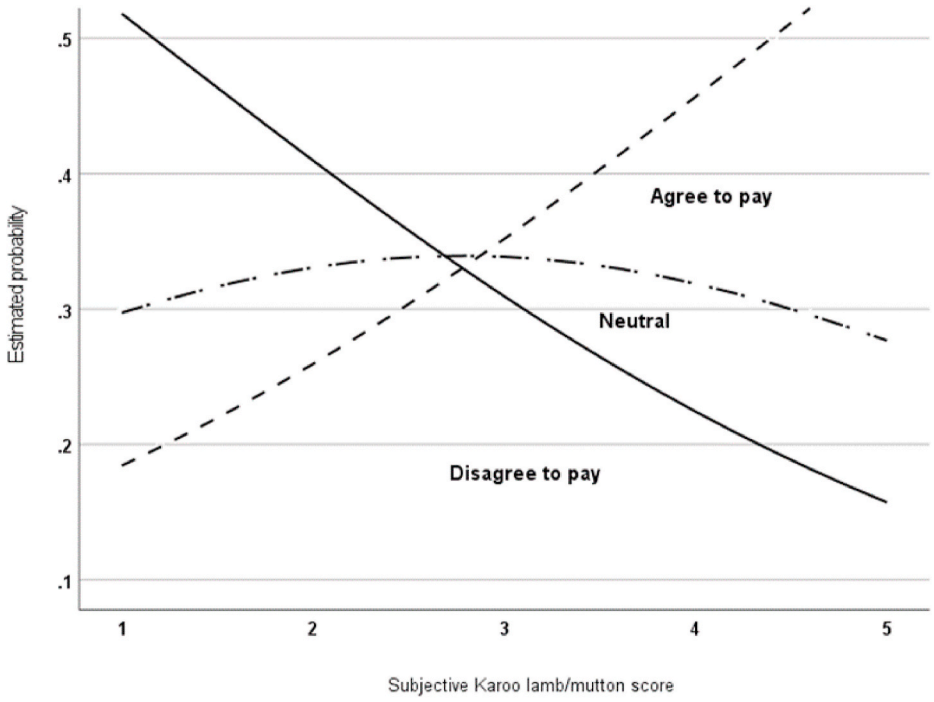

Fig. 3. Probability of willingness to pay a premium for Karoo Lamb against the subjective Karoo Lamb knowledge score.

(score of 1 or 2) had a high likelihood of not agreeing to pay a premium for Karoo Lamb. At higher levels of subjective knowledge (4 and 5), there was a greater likelihood that consumers would agree to pay a premium (Fig. 3).

Various researchers indicate that subjective knowledge is a stronger predictor of purchase-related behaviours than objective knowledge (Aertsens et al., 2011). Likewise, House et al. (2004) found that higher levels of subjective knowledge significantly increased willingness to accept genetically modified food, while objective knowledge did not play a role. Our research confirmed that subjective Karoo Lamb knowledge predicted willingness to pay a premium for Karoo Lamb, while objective Karoo Lamb knowledge did not.

4. Conclusions

The respondents' subjective and objective Karoo Lamb knowledge varied by specific demographic characteristics. White respondents were generally more confident about their subjective knowledge and had a higher level of objective knowledge than Black respondents. Also, respondents with a higher level of education and those from the elite income group scored higher on the subjective knowledge test. Therefore, marketers should target promotional information about Karoo Lamb or mutton to specific demographic groups to build confidence and objective knowledge. Researchers should distinguish between subjective and objective knowledge to fully understand particular consumers' knowledge of the Karoo Lamb production process claims.

Regarding respondents' consideration of the importance of label

information, it is clear that they use lamb labels as a quality indicator. The respondents considered both sell-by date and use-by date, as well as price and price per kilogram to be very to extremely important, confirming that freshness and pricing are dominant purchasing considerations. The respondents also considered antibiotic free and free range to be very to extremely important. Although the production processes such as antibiotic free and free range could signify safety to consumers, it could also imply added costs. Price-sensitive consumers would probably perceive this negatively, while quality-conscious consumers would see it positively. The respondents regarded no hormones added, country of origin and Karoo Lamb as moderately important, which could be considered quality cues. The importance of Karoo Lamb label information did not differ by gender, age, income and education level. However, black respondents considered Karoo Lamb label information less important than White respondents.

The findings show that the importance of Karoo Lamb label information was the most important factor in predicting willingness to pay a premium for Karoo Lamb, followed by population group and subjective Karoo Lamb knowledge. These findings indicate that it would pay to educate consumers on the information provided on Karoo Lamb product labels. White respondents were more willing to pay a premium for Karoo Lamb than Black respondents. It could be worthwhile to take concerted effort to market Karoo Lamb to upcoming Black consumers. Also, as subjective knowledge reflects 'consumers' "self-confidence in the adequacy of (their) knowledge level" (Wei et al., 2018), increasing subjective knowledge could influence perceptions of their ability to process information and, ultimately, their willingness to pay a premium for Karoo Lamb. Subjective knowledge could be increased through advertising exposure, relevant in-store promotions and interaction with knowledgeable salespeople. Objective Karoo Lamb knowledge was not a predictor of willingness to pay a premium for Karoo Lamb. Our findings, therefore, show that the two types of knowledge had different effects on willingness to pay a premium for Karoo Lamb. Put differently, consumers' perceived knowledge influenced their willingness to pay a premium for Karoo Lamb rather than what they actually knew.

As several lamb characteristics are credence attributes, credible labelling can play an essential role in increasing efficiency in consumer choice in the Karoo Lamb market. Therefore, pre-packaged fresh Karoo Lamb should be appropriately labelled. Informed consumer decision making could result in an increase in consumption rates among loyal customers. At the same time, it may also motivate less frequent and potential customers to purchase and learn more about Karoo Lamb.

4.1. Limitations and future research

There are four main limitations to this work. First, although the study attempted to measure respondents' subjective and objective Karoo Lamb knowledge, it is not clear whether they knew the term Karoo Lamb encompasses free range, no hormones added, antibiotic free and grass-fed production processes. These production processes could signify other credence attributes related to sustainability issues about human health, animal welfare and the environment (Bernués et al., 2003; Kirsten et al., 2017; Vermeulen et al., 2015). The items to measure objective knowledge about the respective production processes were only worded in terms of production processes as such. Therefore, it is unclear whether the respondents knew the perceived health benefits for humans, animal welfare, or the environment. Second, the respondents in this study merely ranked the importance of specific claims. Although their responses provide an outward indication of an importance ranking, understanding the reasons behind their importance ranking may be lacking. Therefore, qualitative research, involving projective techniques to gain an in-depth understanding of the conceptual structure of specific terms and the reasons underlying particular actions (De Andrade, 2016; Donoghue, 2000), inducing consumers' importance ranking/rating about specific production process claims is needed. Third, the respondents in this study were more educated, received a higher monthly income and consisted of more White people, implying that these groups were over-represented. Fourth, internet users are a biased sample of the population. The screening also means that only respondents who purchased lamb/mutton products were included in the study. Therefore, the findings can only be applied to these respondents and not the South African population at large. However, this study's implications can still be of importance despite these limitations and should be acknowledged.

This study provides a platform for further application of the measurement of knowledge about production process claims. While this study confirmed the usability of Flynn and Goldsmith's (1999) standardized scale to measure subjective knowledge, the objective knowledge test measured the specific production processes as such. Future qualitative studies could investigate consumers' objective knowledge about production processes in terms of the benefits of consumers' health, animal welfare and the environment to refine an objective knowledge test based on a broader range of questions about the production processes.

Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jretconser.2021.102664.

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