Lamb and Mutton Quality Audit

South African Retail Lamb and Mutton Quality Audit

Industry Sector: Cattle And Small Stock

Research Focus Area: Animal Products, Quality And Value-Adding

Research Institute: Agricultural Research Council – Animal Production Institute

Researcher: Dr Michelle Hope-Jones

The Research Team

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<th>Title</th>
<th>Initials</th>
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<tr>
<td>Dr</td>
<td>PE</td>
<td>Strydom</td>
<td>Ph.D Animal Science</td>
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<td>Dr</td>
<td>L</td>
<td>Frylinck</td>
<td>Ph.D Biochemistry</td>
</tr>
<tr>
<td>Dr</td>
<td>SM</td>
<td>van Heerden</td>
<td>Ph.D Home Economics</td>
</tr>
<tr>
<td>Prof</td>
<td>A</td>
<td>Hugo</td>
<td>Ph.D Biochemistry</td>
</tr>
<tr>
<td>Ms</td>
<td>J</td>
<td>Anderson</td>
<td>N D Analytical Chemistry</td>
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Colour of all products was an acceptable level with no distinct pattern showing for any particular product.

Kreco and legume products have more iron, moisture and less fat compared to feedlot products.

The products, lightly browned samples lost less drip during cooking compared to the remaining products. Turning loss was very low in general for all.

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Executive Summary

Twelve free products (trim loin chops) were identified and collected from the steers of five major retail outlets and weighed smaller bunches on 14 different days to derive the mean values. The samples were coded and stored at the Centre for Meat Quality and collection and collation.

were performed in an attempt to explain variations in consumer related properties.

Consumers of after purchase; physical, physiological and biochemical measurements (proximate, and fatty acid profiles, pH, oxidation and collagen)

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 were performed in an attempt to explain variations in consumer related properties.
• Lipid oxidation was at a good level over all products and fatty acid profile were consistent with free-range vs. grain-fed products. This makes the lack of free-range and Karoo flavours more perplexing.
• Karoo and free-range products were more expensive. Regarding the remaining products, price correlated more with socio-economic area and butchery vs. retailer.
• In general lamb is of a good quality except for drip loss which needs to be attended to. This could be due to incorrect abattoir practices. Karoo lamb is sold at a premium and its lack of flavours is of concern. The consumer however is able to consistently buy tender loin chops at any retailer or butchery.

Popular Article

Quality audit of South African lamb
Dr Michelle Hope-Jones, Researcher: Animal Production Institute, Food Science and Technology Department

Meat tenderness and other quality traits are influenced by a combination of pre-harvest, slaughter and post-harvest conditions and interventions. Research addresses these factors in order to ensure maximum satisfaction for the consumer.

However, the success rate of various sectors of the meat industry to use these technologies may vary depending on factors like technical skills, knowledge, market sector, financial viability and others.

While new projects are designed to address quality challenges, very little is known about the quality of red meat offered to the consumer at various outlets. To this end, a lamb audit was recently conducted to determine the variation in quality (tenderness, colour, water properties and others) within and between different types of outlets, and also to attempt to verify the reasons for variation in quality, so that research or technology transfer can address specific problems.

Product auditing process
The fact that meat in general is distributed all over the country from various production and processing plants, and considering that much of those operations are in Gauteng and distribute to Pretoria outlets, the study was limited to proper sampling and testing within the Pretoria metropolis. All the selected outlets receive meat from different operations, assuring a reliable sample of the industry.

Twenty three products (lamb loin chops) were identified and collected (when available) from the shelves of five major retail outlets (R) and twelve smaller butcheries (B) on 14 different dates over three months (n = 306). Products varied in type, namely Karoo lamb (valued for its unique flavour attributed to grazing on herbaceous bushes and shrubs from a particular region of South Africa), as well as free range and feedlot lamb.

Products also varied in packaging, from modified atmospheric packaging (MAP), where high levels of oxygen are pumped into packages in order for the meat to maintain the desirable red colour that consumers prefer, to PVC overwrap, and also open products displayed on shelves.
Compared to the other products, in fact, they had just over half the drip loss compared to the product with the most drip (R4).

All the range products, as well as two of the Karo products (R2X and B6X), had much less drip loss (the liquid you would find in the tray)

When looking at the flavour profiles, once again the three Karo samples stood out as having a stronger, burnery, flavour. The Karo samples did not have a strong, sweet, aroma.

The opposite was found for the two free range products, which had higher, Karo-based, aroma when compared to the Karo products, but did not

be seen in the flage. Flavour and aroma are major factors for sensory tenderness (tougher), scored low for juiciness too.

In the case of Lamb, flavour and aroma can play as an important role as tenderness. This is especially the case when comparing free range lamb to

The overall good level of tenderness is good news for the industry.

There was a strong correlation between sensory tenderness (rated by a trained panel) and WBSF. Two of the Karo products, B2X and B6X, stood

out as being more tender.

In an acceptable level across all products, all of the Karo products however were more tender. This could be attributable to the use of growth promoters in

Maturation is the most notable quality characteristic and is also cited by consumers as the most important sensory attribute. Figure 1 shows that

eds.

The palatability of meat is determined by a combination of tenderness, juiciness, and meat flavor.

Retailers and butchers were spread over various socio-economic areas.
All products across the board fell into the distinctly brown category. It was expected that packaging, or whether a sample was cut fresh or was on display, would make a difference to the colour of the meat, but not even the MAP packaged samples were of a desirable colour. This is of concern as consumers rely on visual appearance at the point of purchase and meat with a bright cherry red colour is associated with freshness.

Fat and meat (muscle) ratio, price

(Insert Figure 2)

Figure 2 shows the average percentage of fat and the actual muscle for loin chops from the various outlets. All the Karoo (K) and free range (FR) products had more meat (a greater percentage of loin muscle), compared to the other products. It was however slightly unexpected, as feedlot meat production employs beta-adrenergic agonists, which should increase muscle yield and decrease fat percentage.

However, the feedlot lamb still had a higher percentage of fat compared to Karoo and free range samples, which could overshadow the increase in muscle yield of feedlot samples. Fat percentage followed a pattern of decreasing with an increase in loin muscle, with the Karoo and free range samples having less fat.

Price
There was a strong correlation between price and loin muscle, with a larger percentage of loin muscle resulting in an increase in price.

The Karoo and free range products were markedly more expensive, except for R2K (which was sold at a lower level retail store which was more accessible to the bulk of the public). All other Karoo products were sold at butcheries in areas of increased socio-economic status. The area in which the products were bought and the type of retailer/butchery that it was bought from, seem to be more of an indicator of price, than the percentage loin muscle, with stores in higher income areas charging more.

Problems to be addressed
With lamb being an expensive product, it is good to see that the consumer can consistently buy a tender product. There are, however, a few problems which were identified.

- Karoo lamb, which is sold as a speciality product, does not consistently stand out from other free range products.
- Colour as a whole is also a problem, with lamb meat not having the cherry red colour that the consumer associates with freshness.
- Generally only 50% of a loin chop consists of meat and price alone does not seem to be a very accurate indicator of how much meat the consumer will get, except for the more specialised Karoo and free range products, which have a much better meat to fat ratio.

Please contact the Primary Researcher if you need a copy of the comprehensive report of this project – Michelle Hope-Jones on hopejonesm@arc.agric.za