

A QUALITY SURVEY (TENDERNESS) OF LAMB LOIN CHOPS BASED ON PRODUCT CLAIMS AND PACKAGING

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Abstract – At present the only generic regulation of red meat quality in South Africa is the application of the classification system. However, this system only addresses tenderness as far as it is influenced by the age of the animal. Many other factors however also influence the production of lamb and so a survey was conducted to evaluate the quality of lamb at retail level. Karoo products were more tender with lower WBSF ($P = 0.0034$) and higher sensory tenderness scores ($P = 0.0129$). A similar situation was reflected with MFL ($P = 0.0250$). Karoo samples were also more juicy ($P = 0.0003$). Karoo and free range lamb products sell at a premium compared to grain-fed samples so a higher quality product is expected by the consumer. However, other attributes of these products, in particular flavour still need to be discussed.

Key Words – Audit, free range, Karoo.

I. INTRODUCTION

The palatability of meat is determined by a combination of tenderness, juiciness and meat flavour [1]. Of these tenderness is the most variable quality characteristic and is also rated by consumers as the most important sensory attribute. Inconsistency in tenderness is regarded as a major problem facing the red meat industry [2]. In South Africa the lamb production chain is still hugely fragmented for large parts of the industry. This means the final product's quality may vary and the reasons for this variation are difficult to trace. It is also well-known that the origin of sheep meat in South Africa is from pasture as well as from feedlots, probably in equal amounts. This in itself could cause variation with regards to eating quality. There are also indications that beta-adrenergic agonists are used in grain-fed sheep meat production that could contribute further to the variation in quality. In this meat quality survey we investigated the relationship between tenderness of similar meat cuts and product presentation, including packaging and quality claims.

II. MATERIALS AND METHODS

Twenty three products (lamb loin chops) were identified and collected from the shelves of five major retail outlets (R) and twelve smaller butcheries (B) on 14 different dates over 3 months ($n=306$). Products varied in claims (Karoo lamb, free range) and packaging (modified atmospheric packaging: MAP, PVC overwrap) and retailers and butcheries were spread over various socio-economic areas. Tenderness was measured by Warner Bratzler shear force (WBSF), Myofibrillar fragment length (MFL) as well as by a ten-member trained sensory panel on an 8-point hedonic scale for tenderness and juiciness. Data were subjected to a one way analyses of variance.

III. RESULTS AND DISCUSSION

Purchasing from retailers vs. butcheries had little effect on tenderness with WBSF being at an acceptable level across all stores according to Miller *et al.* [3] who suggested that WBS tenderness values of < 3.0, 3.4, 4.0, 4.3, and > 4.9 kg would result in 100, 99, 94, 86, and 25% customer satisfaction for tenderness, respectively. All of the Karoo products (free range lamb from a specific geographical region which has a very distinct flavor due to the herbs which are browsed on) however were more tender ($P = 0.0034$). This could be explained by the use of beta-adrenergic agonists in feedlots. In fact for WBSF the Karoo products from a particular store were almost on the opposite end of the spectrum to the feedlot counterparts from the same store (R2, B6 and to a certain extent B1). These tenderness scores agreed with MFL values (results not shown here) with R2K, B1K and B6K having the shortest MFLs ($P = 0.0250$). Once again the two products from B6 were on opposite ends of the spectrum with the Karoo products being more tender. The other free range products however did not show the same improvements in either WBSF or sensory tenderness.

There was a strong correlation between sensory tenderness and WBSF ($r = -0.72$) with a similar pattern with two of the Karoo products, R2K and B6K, standing out as being more tender ($P = 0.0129$). One of the free range products, R5FR, performed poorly but also scored lower for juiciness and could probably be attributed to abattoir processes. Increased juiciness can give the perception of a more tender product and here the relationship between the two attributes can clearly be seen. Most of the products that scored low (tougher) for sensory tenderness scored low for juiciness too ($P = 0.0003$). The overall good quality where tenderness was concerned was a pleasant surprise as in an audit conducted by Safari *et al.* [4], 20.3% of all mid-loin chops were found to have WBSF values of over 5kg.

Interestingly the MAP packaged product (a grain-fed product) also grouped with the Karoo products in scoring well for all attributes. This is in contrast to Kim *et al.* [5] who found that MAP packaging resulted in lower sensory tenderness scores.

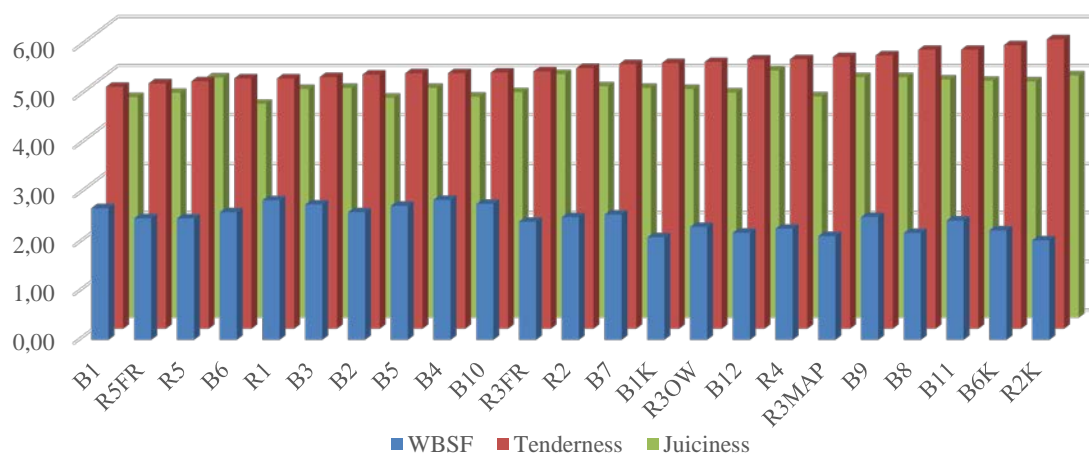


Figure 1 Variation in WBSF, sensory tenderness and sensory juiciness over a range of products sampled across various retailers and butcheries (R: retailer, B: butchery, K: Karoo, FR: free range).

IV. CONCLUSION

The Karoo appear to be of a superior quality to the grain fed products, which is expected as they are marketed in this way and sold at a premium. It must be noted that overall, as far as tenderness is concerned, all the products would be found acceptable to the consumer.

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