

South African Retail Beef Quality Audit



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Research Institute: Agricultural Research Council, Animal Production Institute

Research focus area: Animal Products, Quality and Value-adding

Aims of the project

- To measure the instrumental/physical quality and composition (shear force tenderness, water holding capacity/cooking loss, fat and muscle colour, muscle fat content, collagen properties, oxidative status (rancidity)) of beef loin samples from various retail outlets (including brand names and generic products).
- To determine the reasons for variation in quality by chemical, histological, physical and biochemical tests.
- To use the information from 3.1 and 3.2 to arrive at a list of factors needed to be addressed in research and/or technology transfer to improve meat quality in South Africa

Executive summary

Porterhouse steaks (or a similar cut containing the *m. longissimus lumborum* or loin muscle) were purchased from either bona vide butcheries or food retailers (Pick and Pay etc.). The cuts were purchased as non-vacuum-packed (fresh from counter, packed or cut from primal) or vacuum-packed or frozen (one product). Thirteen outlets were selected and 21 products were tested over 20 collection days spread over 9 months. Price was recorded and shear force tenderness, colour of meat and fat, steak thickness, purge and cooking loss measured as properties valued by consumers at or after purchase. Histological, biochemical and physical measurements were performed in an attempt to explain variation in consumer related properties: Considering tenderness as most important quality trait:

- Price per kg did not correlate well with tenderness. In fact one of the three cheapest products was more consistent in tenderness than some other products much more expensive. However, the most expensive products tended to be more consistent in tenderness.
- Vacuum-packaging was no guarantee for tender meat. In both butcheries and food retailers, tenderness values for vacuum-packed and fresh cuts occurred in tender and tough categories. In some butcheries the chances of selecting a fresh tender steak was higher than a tender vacuum-packed steak. In food retailers, the chances for a tender steak were slightly better when purchased as brand named vacuum-packed steak.
- Brand named products with claimed aging periods from food retailers were in most cases more consistent in tenderness than fresh products with no claim of but did not always guarantee tender products every time.
- Compared against tenderness values (benchmarks) of controlled trials (at this institute) it is clear that the inconsistency in general and poor tenderness of a large portion of the products is the combined effects of the use of beta agonists and poor harvesting and post-harvesting procedures. The results is a sign of a lack of knowledge or reluctance to apply proper procedures or complacency among the various role players in the industry.

For other quality parameters the following were found:

- Steaks from grass fed animals were darker in appearance than steaks from feedlot.
- Almost all quality traits of the frozen product showed that the process and/or duration of freezing was poorly executed which resulted in poor tenderness, excessive drip and poor colour. While frozen products are expected to be inferior to fresh products proper control can minimise the differences.
- Poor colour and moisture characteristics recorded for certain products suggest that harvesting and post-harvesting processes of certain products are neglected. .
- Despite a substantial variation in quality, in particular tenderness, of this product, consumers seems to be satisfied across the spectrum since everybody is doing business. In the case of lower cost products with lower eating quality consumers have probably adjusted their tolerance to afford their taste for meat (steak). Where poor quality products are selling for higher prices, consumers probably have a natural high tolerance for poorer quality. With the prices of meat increasing, will the consumer reach a point where the price does not justify the quality?

List of outputs

- Strydom, P. E., 2012. Choose the right cut. Farmlink, Winter 2012, pp40-42.
- Strydom, P. E., 2013. Lamb: Is it worth the price? Merino Journal 2013, pp6-10
- Strydom, P E, 2011. Meat Quality Survey 2. How consistent is meat quality in SA retail. Elsenburg Forum, RSG Landbou. 1 September 2012 (<http://www.elsenburg.com/radio/2012/f120901.html>).
- Strydom, P E, 2012. Beef: The pricy embarrassment. Lecture at TUKSFoST for Food Science students and lecturers. University of Pretoria, 14 September 2012 (40 students).
- Strydom, P.E., Liebenberg, L., Mosimanyana, L. & Hope-Jones, M. (2012). South African beef quality audit. (2012). Evaluation of alternative packaging methods for retail beef cuts. Proceedings of the 58th International Congress of Meat Science and Technology, Montreal, Canada, August 12-17. ICoMST2012paper33.pdf. 4 pp.
- Strydom, P.E. 2012. Beef Quality Audit. THRIP Annual Progress report. 29 June 2012.