MEAT INDUSTRY CENTRE
VLEISBEDRYFSENTRUM
ANIMAL NUTRITION & ANIMAL PRODUCTS INSTITUTE
DIEREVOEDING & DIEREPRODUKTE-INSTITUUT
PRIVATE BAG X2, IRENE, 0062, SOUTH AFRICA
PRIVAATSAK X2, IRENE, 0062, SUID-AFRIKA
TEL: (012) 672-9341, FAX: (012) 665-1551

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Phillip Strydom
Email: pstrydom@arc.agric
0724491012

TO:

Brian Angus
Woodview@mweb.co.za
Dear Wimpie

Reprort: Warner Bratzler Shear Force measurement loin and ribeye steaks

Objective

To verify the tenderness of a sample of aged loin and ribeye steaks of from a single Wagyu cross carcass against benchmark tenderness for aged beef.

Testing procedure

Vacuum sealed packs loin steaks (from front and tail end of the loin) and ribeye were used as. The samples were dry-aged aged for 14 days and 2.5 to3 cm thick

Preparation: The steaks were prepared according to an oven-broiling method using direct radiant heat (AMSA, 1978): An electric oven was set on "broil" 10 minutes prior to preparation (260°C). The steaks were placed on an oven pan on a rack to allow meat juices to drain during cooking and placed in the pre-heated oven 9 cm below the heat source. The steaks were cooked to an internal temperature of 35°C, then turned and finished to 70°C. The steaks were cooled down at room temperature for at least 2 to 3 hours before shear force measurement. Six cylindrical samples (12.5 mm core diameter) of each sample was cored parallel to the grain of the meat, and sheared perpendicular to the fibre direction using a Warner Bratzler shear device mounted on an Universal Instron apparatus (cross head speed = 200mm/minute, one shear in the centre of each core). Coring of the steaks was done randomly covering the whole surface of the

steaks. The reported value in kg represents the average of the peak force measurements of each sample.

Results and discussion

The individual shear values of the three specimen varied between 2.0 kg (tail end steaks) and 2.9 kg (rear end steaks and ribeye). These values compares favourably with shear values of aged loin steaks tested at this institute previously. It is always difficult to relate actual shear force (and even trained sensory panel) values to consumer satisfaction, since no local data is available. However, Shackelford et al. (1991) reported threshold values of 4.6 kg and 3.9 kg for "retail" and "food service" beef, respectively (samples were prepared according to the same specifications as those used by ARC-Irene Sensory laboratory). Ultimately, one needs at least a shear force of 4.6 kg to have a steak rated at least "slightly tender" by consumers (Shackelford et al., 1991). According to Boleman et al. (1997), consumers were able to differentiate between three categories of tenderness, viz. 2.27 to 3.58 kg, 4.08 to 5.4 kg and 5.9 to 7.21 kg. Ninety four percent of the consumers preferred the first category and was willing to pay a premium for improved tenderness. According to the benchmarks of Boleman and Shackelford the samples tested were most likely very acceptable. It has to be noted that these values do not measure eating experience and considering the high marbling in these steaks, flavour and impressions of juiciness normally associated with high fat content could influence the eating experience to a large extent.

References

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