

## THE RELATIONSHIP BETWEEN BODY CONDITION SCORE AND VENISON QUALITY IN ENTIRE AND CASTRATED FALLOW DEER (*DAMA DAMA*) BUCKS

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Quality assurance of venison is a key to long-term product marketability and has been identified as a key challenge for the Australian deer industry (RIRDC 2000). The recently developed body condition scoring (BCS) system for fallow deer used in this study (Flesch *et al.* 2002) is 1 methodology developed for quality assurance at the production and processing level. This system provides a common language that can be used by farmers, processors and marketers alike to describe carcass characteristics. The body condition scores range from 1 (emaciated), 2 (lean), 3 (prime), 4 (fat) and 5 (over fat). The majority of animals presented for slaughter fall into the scores of 2, 3 and 4, with animals with scores 1 and 5 not used commercially. Quality assurance success will not, however, be achieved by meat description alone, and the task for the Australian deer industry is to link production efficiency and processing to consumer acceptance of the final product. This paper reports on work in progress to assist in the development of quality management guidelines for the production and processing of venison in Australia, with BCS as a key determinant of venison quality.

Entire (n=19) and castrated (n=15) fallow bucks (havers) ranging from 18-24 months of age and with BCS ranging between 2 and 3, were slaughtered by captive bolt stunning and thoracic stick exsanguination within 10 seconds of the stun in the University of Western Sydney experimental abattoir. All carcasses were hung by the achilles tendon and measured for core body temperature and muscle pH at 1 and 24 hours post mortem. Their BCSs were measured ante-mortem and confirmed with carcass measurements post-mortem, according to the method of Flesch *et al.* (2002).

Longissimus dorsi muscles were boned out from each carcass at 5 and 10 days post slaughter and divided into 3 sections, 1 complying with the specified standard for midloin (0079) according to Ausmeat (1995) guidelines, 1 from the foreloin (caudal end) section of the muscle and a third from the hind loin (distal end). These selected cuts were vacuum packed and frozen at -21°C until analysed. Samples were analysed in triplicate for pH, intramuscular fat, colour, shear force, moisture and water holding capacity.

Results from this study indicate that there was no significant difference ( $P>0.05$ ) between slaughter-age entire and castrate (havier) bucks with BCS 2-3 for the meat quality parameters of intra muscular fat, colour (a\*), tenderness and moisture content. There was also no significant difference ( $P>0.05$ ) between samples collected at 5 days and 10 days post-mortem. There were significantly higher levels of fat ( $P=0.039$ ) and moisture ( $P<0.001$ ) in the forequarter loin compared with mid loin samples for both bucks and havers. Bucks had a significantly higher a\* value (meat redness) than havers within the BCS range of 2 to 3 ( $P<0.001$ ).

These data demonstrate that commercial carcasses with BCS between 2 and 3 can be processed at a range of times after slaughter without affecting venison quality parameters. There were also no significant differences in meat quality between entire bucks and havers, with the exception of meat redness. The extent to which variations in fat and moisture content between the mid and fore-loin affect consumer perception of meat quality is yet to be determined. Additional investigation and comparisons of venison quality between male, female and castrated fallow deer of BCS 3 and 4 in conjunction with sensory evaluation of venison over the range of commercial BCS will complete this study.

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