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A cuts based ageing strategy for hot boned beef (#459)

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Introduction

With hot boning (HB), primal cuts are removed from a carcase about 1 hour post slaughter before the onset of rigor and immediately prior to the onset of chilling. Compared to cold boning (CB) , done 24 hours later and after chilling, hot boning is easier to do, improves meat yield and reduces the mass to chill (Pisula & Tyburcy, 1996). However, hot boned meat can be tough due to sarcomere shortening (White, O'Sullivan, Troy, & O'Neill, 2006) and is generally used for low value animals that have poor eating quality. Dry ageing improves tenderness so may be a way of improving the quality of selected cuts from hot boned carcases, to add value to these cuts.

Methods

Twenty four yearling Droughtmaster (*Bos indicus*) steers were fed on grain for 70 days then slaughtered in the one consignment at a commercial abattoir. Directly after slaughter the carcasses were subjected to one of 3 electrical stimulation treatments (no stimulation, low and high stimulation). The carcasses were stimulated with a low voltage nose to tail stimulation system (6ms pulse width, with 64ms pulse interval, 15.6 Hz, at 100V peak for 15 seconds averaging 1.14A 0-peak), and applied for 15 seconds in the high stimulation group and 5 seconds in the low stimulation group. Carcasses were split into sides and each side was allocated to one of 3 cutting treatments. The cutting treatments were:

1. CB whereby the carcasses were hung by the Achilles and boned after chilling
2. HB whereby striploins were removed pre-rigor and chilled on a rack.

The cutting treatments were distributed to the left and right side of the carcass evenly as well as being balanced within a carcass and electrical stimulation groups.There were two ageing treatments wet and dry, both of which lasted for 28 days. For the wet treatment, striploins were vacuum packaged and kept at 2°C. For the dry treatment, a cool room with a temperature of 1.80±0.041°C and relative humidity of 86.95 ±0.245% was used.The samples were cooked from frozen in vacuum bags in a water bath preheated to 70°C. From each sample, five 1 cm^2 replicate samples were cut parallel to the orientation of muscle fibres and WBSF was measured using a Warner Bratzler shear blade fitted to a Lloyd Texture Analyser with a 1000N load cell (TA-2, United Kingdom). Values are reported in newton's (N).Statistical analyses were performed using Genstat version 18.0. REML analysis was conducted using a linear mixed model. The fixed effects were treatments; electrical stimulation (no, low & high), cutting method (CB & HB), and ageing method (Wet & Dry). Random effects were side (left or right) within carcase.

Results

There were significant effects ($P<0.01$) of both cutting and ageing treatments on Warner Bratzler shear force but no interaction between the two. There was no effect of electrical stimulation treatment on shear force ($P>0.05$). HB increased shear force compared to CB and dry ageing reduced shear force compared to wet ageing (Figure 1).The shear force values suggest that dry aging might overcome the negative affect of hot boning on tenderness. Hence striploins processed in this way are likely to be tender and acceptable to consumers for eating quality.

Dry ageing would normally be used for high value cuts and not in combination with a processing technique such as hot boning that is expected to reduce the eating quality of a carcase. However, hot boning might be used to reduce processing and chilling costs and improve yield at the carcase level. Followed by dry ageing to improve eating quality and financial value of the specific cut. This approach could be appropriate in situations where low value animals are currently processed for the manufacturing market, such as pastoral cattle produced in the North West region of Western Australia.

The potential advantage of using these two processes together, would be to achieve the benefits whilst minimizing the negative effects of these two processes, by adding value to specific cuts. In this way the ageing strategy will be determined by the potential value of the cut independently of the deboning method. Further investigation is required to determine the acceptability to consumers and the commercial viability of such an approach.

Conclusion

Dry ageing reduced the shear force of striploin compared to wet ageing for a 28 day ageing period.

Notes

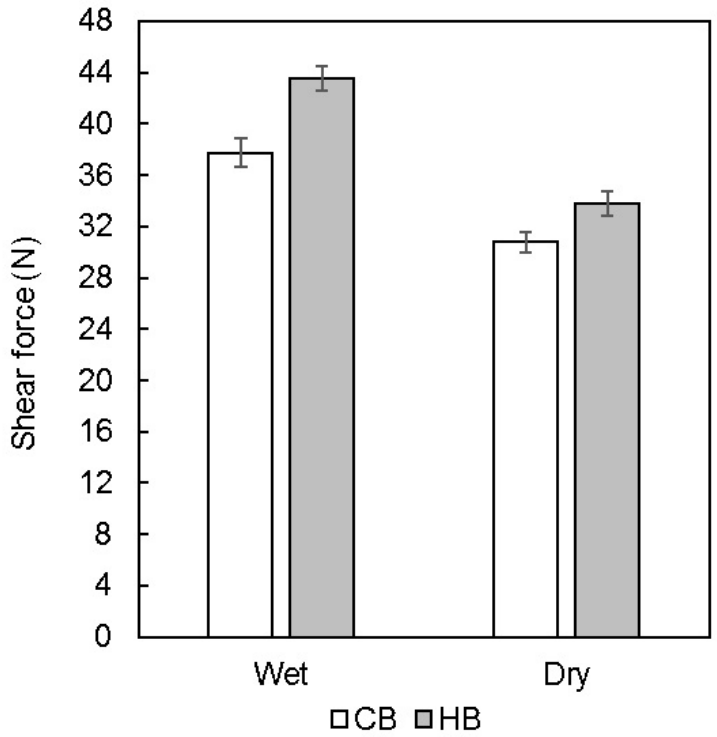

Figure 1
The effect of cutting (CB , HB) and ageing (Wet and Dry) treatments on shear force.

Notes