

EFFECT OF TIME BETWEEN MUSTERING AND SLAUGHTER ON MUSCLE pH OF CATTLE

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Ultimate pH is important, because it affects the tenderness, muscle colour and shelf life of beef. Many cattle spend extended periods in property yards, in transit and at abattoirs, yet Shorthose (1980) found that increasing time between farm and slaughter was detrimental to muscle pH. We studied the effect on muscle pH of cattle subjected to varying holding periods at the property and abattoir.

Brahman crossbred bullocks were yarded for 2 d (66 hd) or for 4 d (88 hd), with water, on the property. Before transportation, the bullocks within each group were allocated to give in *toto* four groups each of 36. Groups A, B and C were then sent 450 km (1 day's travel) to an abattoir and rested for 1, 6 or 8 days. Group D travelled a further 1,430 km (5 day's travel) to a different abattoir, resting twice *en route* and for 3 d on arrival. Feed and water were available during all resting periods. Groups C and D were slaughtered on the same day. We measured the pH of *M. longissimus dorsi* 24 h *post-mortem* at meat temperature (c. 10°C). Carcass weights were recorded. The pH data were subjected to analysis of variance.

Mean muscle pH values were 5.78, 5.55, 5.56 and 5.75 \pm 0.022 SE for groups A, B, C, D, respectively, with A and D significantly ($P < 0.01$) different from B and C. Holding bullocks for 2 or 4 d at the property did not affect mean muscle pH (5.65 v 5.67 \pm 0.015 SE). The mean carcass weight for all animals was 261.2 \pm 2.67 kg (\pm SE).

The results indicate that transporting animals reduces muscle glycogen concentrations and sufficient time is needed after arrival at the abattoir for these concentrations to be replenished. The higher pH values for groups A and D signify that rest periods of 1 and 3 d were not adequate after journeys of 450 and 1,880 km, respectively. With the longer rest periods of 6 and 8 days after 450 km, pH values approached the optimum of 5.5. A reduction in muscle pH with 4 rather than 2 day's rest after a long journey was reported by Shorthose et al. (1972). Our study suggests that the combination of transport *per se* and distance affected muscle pH, supporting other work with cows (Wythes et al. 1981). During each in transit resting period, cattle could replenish muscle glycogen concentrations to some extent, hence minimizing the cumulative effects due to increasing distance. Holding cattle in familiar surroundings on the property did not affect muscle pH. This finding confirms other work with bullocks held for 0, 24 or 48 h before transportation (Wythes and Underwood 1980).

This study has shown that resting time at the abattoir can have a marked effect on lowering muscle pH, although the optimum lengths of resting periods relative to journey length still have to be determined.

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