Cleaning up our cattle: shining new light on an old practice

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Pre-slaughter hide washing is a fundamental component of the lairage process in Australian abattoirs. Currently, cattle in Australia are required to be washed prior to slaughter under Australian Standards (AS 4696:2007), and those of importing counties. The objective of this procedure is to remove contaminants from the hide and minimise the potential for their transfer to the resulting carcass. However, literature suggests that pre-slaughter hide washing is not consistently effective at controlling carcass contamination and may in fact worsen it (Bell 1997; Byrne *et al.* 2000; Mies *et al.* 2004). Meat hygiene is just one aspect of beef production and should not occur to the detriment of other outcomes of processing like meat quality, and animal behaviour and welfare, which are of increasing importance to the modern consumer. This paper presents a brief summary of our work in this area.

Pre-slaughter hide washing has a negative effect on both meat quality and animal behaviour and welfare (Preston *et al.* 2018). Dark cutting beef, defined by high ultimate pH (>5.70), results from insufficient lactic acid accumulation post slaughter, as a result of glycogen breakdown being initiated ante-mortem. An increase in the number of times cattle were washed was associated with an increase in the incidence of dark cutting beef. A study of 2,390 pasture finished cattle from 75 mobs forming 129 replicate groups found that for each wash a group received in lairage (using a recycled water in-floor sprinkler system), dark cutting incidence of the group increased by 6.6±3.0% (P=0.029) (Preston *et al*. 2018). Cattle received 0 to 7 washes, each of which lasted an average 18±5 minutes. Alternatively, lairage wash duration had a positive effect with less dark cutting observed as duration increased (slope -0.3±0.1%, P= 0.035) (Preston *et al*. 2018). Together, these results suggest that water being turned on initially is the main source of stress to cattle, given the large effect caused by the number of washes received. A longer duration of washing may allow cattle to acclimatise somewhat to the procedure, although the effect of duration is small. These results agree with those published by Petersen (1983), who reported a positive linear relationship between the ultimate pH of lambs and number of washes they received. These results suggest lairage washing is a source of stress initiating this process.

The behaviour of beef cattle changes in response to pre-slaughter hide washing, with behaviours indicative of stress increasing, and resting behaviour decreasing. A study of 177 cattle forming nine replicate groups were observed prior to, during, and post washing, and behaviours related to stress including shaking, head down, laying down, and group movement were observed. Pre-slaughter washing resulted in changes indicative of stress in all behaviours observed (P<0.001). During washing, shaking and head down behaviour increased compared to the level observed prior to washing (P<0.001). Post washing, these behaviours did not return to their resting level observed prior to washing. Prior to washing, head down and shaking was observed in 7.9% and 1.3% of animals in a group, increasing to 29.8% and 7.1% during washing, and returning only to 13.3% and 5.6% post washing, respectively. Laying down behaviour was observed in 4.9% of animals in a group and almost completely ceased once washing commenced (P<0.001). These observations suggest pre-slaughter hide washing is a stressful event for cattle which changes behaviour and may adversely affect welfare.

There is a clear need to identify a method for pre-slaughter hide washing which maintains or improves carcass hygiene, without having a negative effect on meat quality, or animal behaviour and welfare. This work highlights the importance of ensuring there are strong foundations underpinning industry practices, and the value of going back to basics in order to make progress.

References

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