

The welfare implications associated with mulesing and an evaluation of alternative practices

Discusses the welfare issues associated with current mulesing techniques and the benefits of alternative methods in terms of both sheep welfare and productivity.

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Introduction

Flystrike is a significant health issue affecting the productivity of the Australian sheep industry and costing an estimated \$280 million annually (Lepherd *et al.*, 2011a). Mulesing, currently the most effective and practical method of controlling flystrike, involves the surgical removal of skin around the breech, resulting in scar tissue that is resistant to blowfly infestation (Edwards *et al.*, 2011; Lepherd *et al.*, 2011b). The practice is traditionally performed without any form of pain relief, and as such, raises a number of welfare concerns due to the extent of damage and pain inflicted (Edwards *et al.*, 2011). The Australian Wool Industry originally intended to phase out mulesing by 2010, but no suitable alternatives have yet been adopted into current practice (Evans *et al.*, 2012). This paper examines recent studies by Lepherd *et al.* (2011a), Edwards *et al.* (2011) and Evans *et al.* (2012) that compare physiological, behavioural and production impacts of mulesing with two proposed alternatives.

Discussion

The application of plastic clips to loose skin on the breech has been proposed as an alternative method to prevent flystrike. Clips are applied at sufficient pressure to induce avascular necrosis of the breech and result in sloughing of dead skin and an enlarged bare area two to four weeks after treatment (Evans *et al.*, 2012). Lepherd *et al.* (2011a) examined the short-term systemic effects of this procedure compared to mulesing, using tail-docked lambs as a control. Blood samples were taken from 50 Merino lambs prior to treatment and during the subsequent 29 days to measure biochemical and haematological changes following treatment. Mulesed lambs exhibited a significant increase in neutrophil and leukocyte concentrations, most likely due to inflammatory responses stimulated by the removal of breech skin. Mild hyperglycaemia was also observed for the mulesed group as a result of corticosteroid and catecholamine release due to the stress and fear induced by the procedure. In contrast, neither white cell count nor glucose concentration was elevated in the clip treatment, indicating that this practice stimulated a mild systemic response.

In a similar study, Edwards *et al.* (2011) observed the behaviour of clip and mulesed lambs as an indication of animal welfare. Merino lambs ($n=55$) aged 10-12 weeks were randomly allocated treatments (control, clip, intradermal injection or mulesing) and monitored via video for two hours following the procedure. Lambs did not appear negatively impacted by the clip treatment, as standing with the head down was the only abnormal behaviour observed. In contrast, mulesed lambs were less likely to eat or drink and often stood in a hunched posture with reduced walking and lying behaviour. Due to the subjective nature of pain, one significant limitation of this study was the inability of observers to accurately assess the degree of discomfort experienced by lambs. However, studies by Weary *et al.* (2006) state that changes to normal behaviour following surgical procedures can be a reliable indicator of pain, so this study can be used as a sound basis for monitoring the behavioural impacts of mulesing.

Evans *et al.* (2012) assessed the efficacy of plastic clip use and the production benefits associated with this alternative method. The study was conducted at five commercial properties in South Australia, Victoria and New South Wales, to account for variation in environmental conditions within the wool industry. Merino lambs ($n = 1483$) of 2-12 weeks were randomly allocated mulesing, clip or control treatments and monitored for 180 days following treatment. Evans *et al.* (2012) found that clips were efficient in reducing breech wrinkle and increasing the proportion of bare skin, with subsequent reduction in faecal accumulation and urine staining. These physical changes, although not as significant as those induced by mulesing, were considered adequate to prevent flystrike. In addition, Evans *et al.* (2012) observed lower bodyweight for mulesed lambs with negative effects remaining for

180 days. This was associated with a reduced survival rate (89%) compared to clip lambs (93%), providing evidence of the production benefits associated with this alternative method. Research by Colditz *et al.* (2011) supports this finding, as inflammation and local swelling induced by mulesing was shown to cause decreased growth rate and wool production during the recovery period.

Lepherd *et al.* (2011a) and Edwards *et al.* (2011) also examined the use of intradermal-cetrimide (IC), a chemical that induces tissue necrosis and scarring of the breech area, as an alternative to mulesing. Lepherd *et al.* (2011a) recorded a prolonged increase in plasma concentration of acute-phase proteins (APP) for mulesed lambs, compared with the control group. This suggests APP levels are directly proportional to the degree of tissue damage and inflammation. IC-treated lambs exhibited a significant increase in the APP serum amyloid A (SAA) concentration in the 24 hours following treatment, indicating a short-term stress response. However, as the protein is associated with metabolism of cholesterol released from damaged cellular membranes, Lepherd *et al.* (2011b) suggest that the extensive necrosis and cell death induced by the chemical is likely to account for the heightened SAA levels. Similarly, Edwards *et al.* (2011) examined the behavioural changes associated with IC treatment in contrast to mulesing. While some abnormal behaviours, such as kneeling and standing with the head down, were exhibited by IC-treated lambs, these behaviours were less severe than those observed for the mulesed group. Anecdotal evidence also stated that the behavioural affects were absent 24 hours after the study and so are considered transitory (Edwards *et al.* 2011).

Conclusion

These three studies provide a valuable contribution to the improvement of sheep welfare and indicate the potential use of alternative methods to prevent flystrike. Application of clips was shown to be the least invasive procedure and is likely to be favoured by the Australia Wool Industry for integration into current practice. Continued research into this area will further advance sheep welfare and eliminate farmer reliance on the cruel and primitive practice of mulesing.

References

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