

Mulesing – A Review of Alternatives Researched in 2011-2012

This review compares the welfare implications of mulesing with two emerging alternatives: occlusive clips and intradermal treatments.

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Introduction

Breech-strike is one of the most significant health problems of sheep populations in Australia, costing the wool industry approximately \$280 million annually and resulting in significant illness and sometimes death (Lepherd *et al.*, 2011). The practice of surgical mulesing to remove skin folds adjacent to the perineum and tail is a preventative measure against breech-strike, but it raises welfare concerns due to wound severity and the pain inflicted. For these reasons, finding alternatives to this method has been a high priority in research. Finding long-term solutions to breech-strike, such as a breeding for naturally occurring bare skin around the breech, is imperative (Scobie *et al.*, 1999). However, until this is achieved, it is vital that we assess the welfare implications of currently emerging mulesing alternatives. These emerging techniques are explored in three recent studies, which each assess, by different methods, the welfare implications of traditional mulesing versus two new alternative practices: occlusive clips and intradermal treatments.

Discussion

Finding a way to measure the welfare implications of alternative mulesing techniques, such as occlusive clips and intradermal treatments, is vital. Three studies have assessed each technique using different methods, which, when looked at holistically, give us a well-rounded indication of the benefits and detriments of each procedure. Lepherd *et al.* (2011) assessed each technique by repeatedly measuring changes in bodyweight, haematological and biochemical profiles, and concentrations of fibrinogen, haptoglobin and serum amyloid-A for 29 days post treatment. Lambs (n=50) were divided into five treatment groups: mulesing, intradermal-cetrimide treatment, clip application, tail-docking only, and no treatment. In contrast, a study by Edwards *et al.* (2011) quantified lamb welfare by assessing changes in lamb behaviour as an indication of pain during the first 120 minutes after treatment. This was achieved by randomly assigning lambs (n=44) aged between 10 and 12 weeks into four treatment groups: control, mulesing, intradermal sodium lauryl sulphate (SLS), and clip. The behaviour of each group was then monitored, specifically observing time spent feeding, drinking, lying, walking, running, kneeling, standing with head down, and standing with head normal. Finally, Evans *et al.* (2012) compared the effectiveness of plastic occlusive clips as an alternative to mulesing by measuring the perineal and tail bare areas, breech wrinkle, dag accumulation, urine stain, bodyweight, and survival of lambs. In this study, lambs (n=1,483), over five separate properties, were randomly allocated into one of three groups: control, mulesing, and clip. By interpreting the results of each study, we can determine both the effectiveness and welfare implications of each technique.

The use of plastic occlusive clips involves attaching clips to the same section of breech skin where mulesing is performed; this results in ischaemic necrosis. The dead skin eventually falls off, creating a bare area similar to that produced in mulesing, but without creating an open wound (AWI, 2005). When comparing clipping with mulesing, Edwards *et al.* (2011), found that mulesed lambs ate, drank, walked, ran and lay down less often, stood with their head down for longer and had a longer latency to start feeding than the clipped group. It was concluded that these behaviours indicated reduced welfare in the mulesed group. Lepherd *et al.* (2011) reached a similar conclusion, with results showing that clipped lambs had significantly lower increases in all three acute-phase protein (APP) concentrations than the mulesed group. The mulesed group was also the only group to develop a persistent decreased albumin/globulin ratio, mild anaemia and transient hyperglycaemia. Finally, the clipped group, unlike the mulesed group, did not lose weight after treatment.

Evans *et al.* (2012) reported comparable results, finding that clipped lambs weighed more than mulesed lambs after treatment, and had a higher cumulative percentage survival 90 days after

treatment, indicating not only increased welfare, but also economic gain. The same study also investigated the *effectiveness* of clips, and found that while clipping increased the size of the perineal and tail bare areas compared with the unclipped unmulesed group, the increases were less than in the mulesed lambs. Consequently, the clipped group had slightly more breech wrinkle, dag, and urine stains. However, the study did not investigate whether this small difference would increase clipped lambs' susceptibility to breech-strike when compared to mulesed lambs. Provided more research is conducted to investigate its effectiveness at reducing breech-strike, clipping may be a viable and economical option to increase lamb welfare when compared to mulesing.

Intradermal treatments are another proposed alternative to mulesing. The technique involves injection, using a compressed-air gun, of either cetrimide or SLS one millimetre into the dermis on either side of the perineum and under the tail. This causes necrosis of the surrounding skin, and aims to stretch and tighten the breech skin, as happens in mulesing (Edwards *et al.*, 2011). Edwards *et al.* (2011) established that, like clipping, intradermal SLS-treated lambs showed less behavioural inhibition than mulesed lambs. One limitation of this study was that behaviour was assessed for only 120 minutes post treatment, thus failing to address the long-term effects of each treatment. Another limitation is the subjective nature of pain, making it difficult to assess through behaviour alone. Lephherd *et al.* (2011) also explored the use of intradermal cetrimide and found that, while it was slightly better than mulesing, it was inferior to clipping. Intradermal cetrimide, when compared to clipping, had a higher increase in APP concentrations, a higher neutrophil/lymphocyte ratio, and, like the mulesing group, these lambs lost weight in the first week. Due to these findings, it was concluded that both intradermal treatment and mulesing compromised lamb welfare.

Conclusion

These three studies provide an important contribution to knowledge and, as a whole, present a well-rounded view of the welfare implications of mulesing versus clipping and intradermal treatments. At this stage, providing further research is conducted to ensure its effectiveness, clipping offers the best welfare alternative. However, clipping is still not entirely welfare friendly, so further research is required to find a long-term solution that eliminates the need for mulesing and its alternatives altogether.

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