Breech modification of Merino lambs for flystrike prevention

An assessment of the systemic effects, tissue damage, wound healing and efficacy of three different methods of breech modification of Merino lambs for flystrike prevention

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Introduction

Selective breeding of Merino sheep for maximum wool production has the unfortunate consequence of excess skin-folds around the breech area (from the base of the tail to the medial aspect of the thighs) (Evans *et al*., 2012). Due to their positioning near the anus and vulva in ewes, the skin-folds are often moist with trapped urine and faecal matter, making a perfect environment for fly larvae, usually *Lucilia cuprina* (Tellam *et al*.,1997). Fly larvae feed on the skin and underlying tissues, resulting in a cutaneous myiasis known as flystrike, which causes severe pain and often death if left untreated (Tellam *et al*.,1997).

Discussion

The breech area is modified to reduce predisposition to flystrike. Although controversial, the currently accepted method of breech modification is mulesing, which involves the surgical removal of excess skin-folds, creating an enlarged perineal bare area of stretched scar tissue that is less prone to flystrike (Lepherd *et al*., 2011b). Mulesing is generally performed without analgesia or anaesthesia and, due to the associated welfare issues, alternative methods of breech modification are being investigated (Evans *et al*., 2012). Two of these alternatives are intra-dermal injection of cetrimide (IDC) and application of occlusive polypropylene clips (already commercially available) to the breech and tail skin folds (Evans *et al*., 2012).

A study by Lepherd *et al*. (2011a) examined the short-term systemic effects of these three different methods by measuring concentrations of acute phase proteins (APPs). The study separated lambs into five treatment groups: mulesing and tail-docking (n=10), IDC-treatment and tail-docking (n=10), clip-treatment and tail-docking (n=10), tail-docking control (n=10) and handling control (n=10). The study measured changes in bodyweight, haematological and biochemical profiles, and concentrations of three APPs over a period of 29 days post-treatment. The mulesing procedure resulted in the greatest magnitude and duration of systemic changes, including a marked increase in APP concentrations, development of mild anaemia, transient hyperglycaemia, and the greatest decrease in bodyweight. The IDC group followed, with a marked increase in APP concentrations and weight loss. Clip-treatment resulted in only mild changes in APP concentrations and no weight loss (Lepherd *et al*., 2011a). However, it is not appropriate to judge how humane a procedure is on the systemic response alone, as APPs are involved in coagulation and innate immunity, so their elevation after mulesing may be largely due to the breach of skin. Lomax *et al*. (2008) state that measuring biochemical or physiological responses is inadequate for direct assessment of pain responses, as they are readily confounded by non-pain-related variables, such as handling, stress and wounding.

A second study by Lepherd *et al.* (2011b) assessed tissue damage and wound healing of lambs after mulesing, clip-treatment and IDC-treatment. The study group of mulesed (n=30), IDC-treated (n=30), clip-treated (n=10) and control (n=30) lambs were killed at six fixed time points during the 3-47 days post treatment and treatment areas were examined grossly and microscopically. The study found that mulesing wounds healed in 32-47 days. Both clip application and IDC treatment had similar healing latency to mulesing, although an inconsistency in cetrimide penetration sometimes resulted in persistence of necrotic tissues adjacent to the treatment area, leading to delayed and inadequate wound healing and poor skin tightening around the tail. Despite the occasional problem with clips slipping so preventing complete occlusion and facilitating the formation of viable skin dags (evident in two out of ten lambs), the clips were otherwise successful in tightening the breech skin (Lepherd *et al*., 2011b). Further to this study, larger scale field trials are required in order to determine the efficacy of the treatments in preventing flystrike.

One such study by Evans *et al*. (2012) aimed to evaluate the efficacy of mulesing and clip-treatment in preventing flystrike by comparing faecal accumulation, urine staining, bodyweight and survival of lambs on five different farms. Lambs were divided into three groups: mulesed (n=505), clip-treated (n=503) and unclipped, unmulesed controls (n=486). All three groups underwent tail-docking. The mulesed lambs had larger perineal bare areas, while the clip-treated lambs had reduced levels of breech wrinkle, dag and urine staining that lay between those recorded in the mulesed and control groups. In addition, the clipped lambs weighed more than mulesed lambs after treatment and had a higher rate of survival (Evans *et al*., 2012). A study by Hemsworth *et al*. (2009) also demonstrated substantial positive benefits of clip-treatment, with a significant increase in growth rates of clip-treated versus mulesed lambs. This has an important implication for farm productivity as there is a strong association between lamb bodyweight and post-weaning survival (Hemsworth *et al*., 2009). Further evidence of this association is seen in a study by Hatcher *et al*. (2008), which analysed the survival of weaned sheep and found that both lighter lambs at weaning and those with low growth rates post weaning had an increased risk of mortality.

Conclusion

As evident in the studies discussed above, clip-treatment seems to be a viable method of breech modification without the drastic systemic effects and weight loss associated with mulesing. However, these studies are all relatively short-term, and further research is required to ensure that the procedure can impart long-term protection against flystrike.

As long as producers are breeding Merinos with excess skin-folds in the breech area, modification is likely to be necessary to reduce the incidence of flystrike. The most promising approach involves genetic selection for bare, wrinkle-free breech areas. Selective breeding should be integrated with management practices that take into account timing of shearing and crutching, worm control and strategic application of chemical treatments. It is the responsibility of wool producers to work towards breeding away from wrinkly breech conformation, but in the meantime further research into less painful and invasive techniques for flystrike prevention should be carried out, and producers should make use of adequate anaesthesia/analgesia to protect the welfare of their animals. The resulting improvements in growth, productivity and reduction in fatalities (Evans *et al*., 2012; Hemsworth *et al*., 2009; Hatcher *et al*., 2008) are likely to help offset any extra costs involved in the implementation of more humane practices.

References

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