This report summarises the findings from the University Of Melbourne's research into freeze branding breech modification in Merino lambs.

Key points

- Freeze branding of sheep results in significantly better weight gain than mulesing with pain relief.
- Freeze branding does not result in an open wound unlike surgical mulesing; hence flystrike risk is eliminated.
- Lamb behaviour was similar in both mulesed (with pain relief) and freeze branded lambs.
- Previous studies have demonstrated that pain relief ameliorated much of the responses to surgical mulesing in comparison to lambs not mulesed.
- Liquid nitrogen has been used in the cattle industry for many years for branding purposes and is used extensively in human medicine to remove warts and various skin lesions. It's use in humans is associated with minor discomfort and generally is not used in conjunction with pain relief.
- To quote the paper's authors, "Over the longer term, the slightly better weight gain and the described differences in wound healing, suggest that the Freeze Branding application may provide these animal welfare benefits over surgical mulesing."

Background

Merino lambs are mulesed in Australia to prevent the devastating welfare impacts of fly strike by the green blowfly, *Lucillia cuprina*, a fly that evolved from a carrion striking fly in its native South Africa, to a fly that strikes live sheep to lay its eggs. This change in fly behaviour started to become a larger issue to the Australian sheep industry as it spread across sheep raising districts during the 1920s and 1930s.

A South Australian grazier, John Mules, invented mulesing in 1929 to remove the wrinkled skin around the breech of the animal. It is very effective in reducing the risk of sheep being struck by *Lucillia cuprina*, and hence is still recommended, with pain relief, by the Australian Veterinary Association as the best way to ensure the welfare of sheep are not affected by blowfly strike over their lifetime.

Freeze branding delivers better weight gains

While lambs that were only castrated and had the tail removed with pain relief were significantly heavier than lambs that were mulesed with pain relief, the lambs freeze branded with pain relief were not significantly lighter. Freeze branded lambs were 0.8 kg/hd heavier than lambs mulesed with Trisolfen pain relief.

This difference in weight is likely to be translated into lower supplementary feeding costs over summer and lower weaner mortality rates, as weaning weight is a key determinant of mortality risk in Merino weaners.

Improved lamb behaviour

The incidence of abnormal behaviour was low during the trial. On Day 3 after treatment there were no significant differences in behaviour across the different treatments.

Abnormal behaviour is usually taken as the best standard to judge animal welfare. Unfortunately, there were some confounding factors and limitations to the study. Firstly, low trial lamb numbers meant some of the behavioural differences were not statistically significant, so a number of behaviours were aggregated to strengthen statistical power. Therefore, there may be some limitations to the interpretation of these results.

Lameness was found to be present in the trial sheep flock during the trial. This is likely to have been a confounding factor for assessing behavioural changes associated with the various treatments.

Improved wound management

The area of skin that was affected by freeze branding or mulesing was similar in both treatments, meaning that it is likely that freeze branding will result in a similar bare area to mulesed lambs by the time the animal reaches adulthood.

However, the freeze branded lambs did not have an open wound, unlike the mulesed lambs that all had an open wound that took some time to heal. This represents a real risk of flystrike subsequently occurring due to the open wound, in the mulesed lambs.

Limitations of the trial study

As mentioned previously, there were two main significant factors that limited the outcomes from the trial: -

- Limited numbers of lambs in each treatment group limited the statistical power to differentiate results between the treatments.
- Non mulesed lambs go through lamb marking processes. A comparison of lamb marking processes with rings on tails and for castration without Meloxicam pain relief is common industry practice. A comparative study was requested to be included but there was insufficient time.
- The presence of lameness in the trial sheep, could have made behaviour difficult to interpret and differentiate differences between the treatments.

Freeze branding delivers better lamb welfare outcomes

Flocks running Merino sheep for wool and meat production are not in a position to stop mulesing or breech modification without the risk of poor animal welfare outcomes. Some Merinos have breech wrinkle score and breech bareness at a point that they do not need to mules or reduce breech wrinkle further.

But the vast majority of flocks are likely to experience very poor animal welfare outcomes if the breech of their sheep is not modified in some way. Namely: -

- These non-modified sheep will be intrinsically very susceptible to the cruel consequences of breech strike over their whole life, typically up to 5.5 years of age.

- As a result, they will need to be frequently treated with chemicals to prevent blowfly strike.

- Further, the skin around the breech is in danger of significant damage, including removal, every time the sheep are crutched or shorn, which is at least twice a year and sometimes three times in the year.

- This could result in the removal of the skin around the breech area by the time they are 5 years of age.

- It also takes longer to crutch the sheep, with some crutchers now charging a significant premium to crutch non-mulesed sheep.

On the other hand, this trial has demonstrated that freeze branding of the breech area of a lamb is likely to reduce breech wrinkle to the same level of the mules operation, they will be heavier than mulesed lambs and wound healing is superior with little risk of flystrike of the wound.