Future options to reduce reliance on surgical mulesing
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Summary
Although most members of the sheep industry currently defend surgical mulesing, there are strong indications that this position cannot be sustained in the medium- to long-term.

The industry must support a research and development program to enable an orderly retreat from surgical mulesing to non-surgical alternatives. In the short- to medium-term, non-genetic options can be used. Some of these will result in extra and on-going costs.

The long-term solutions should be based on an investment in permanent genetic solutions, as this will be cost effective to farmers in the long term. It is also likely to be the most advantageous option for public perception and consumer preferences.

This issue is very similar to integrated parasite management, where the short-term emphasis involves non-genetic solutions while there is a commitment to a longer-term genetic solution.

Keywords
Mulesing, non-surgical, welfare, management, genetics

Introduction
During the early days of the development of the Australian Merino sheep, selection of sheep was based on subjective classing, which is still in practice. Showing of stud animals was also based on subjective classing. With this method some characteristics become fashionable, because of the perceived positive associations with production and fitness. However, some can only be described as fancy traits. This was the process of breed development in the northern hemisphere and the major Australian Merino ‘strains’ or ‘blood-lines’.

In the early stages of the Australian Merino wool industry the main economic driver was greasy fleece weight. In this environment it was not surprising that breeders came to the conclusion that individual skin surface area equated to more wool follicles per sheep and therefore greater fleece weight. There hence followed a period of selection for an increase in skin folds or wrinkles. This fashion reached its highest point with the introduction of the extremely wrinkly Vermont Merino from USA in the 1880s. However, the Vermont sheep were soon found to have fitness problems including increased susceptibility to blowflies (Cameron, 1999). Even when the fashion towards extremely wrinkly sheep was reversed many breeders still favoured sheep with large loose skin folds under the neck and some wrinkles over the rest of the body.

The other notion to increase greasy fleece weight was to have more wool on the extremities or ‘points’ including the face, legs and the breach area. However, more wool on the face resulted in ‘wool blindness’ requiring ‘wigging’ and reduced fecundity. Wool on the lower legs resulted in more vegetable matter contamination leading to more wool in the lower value cast lines, and more wool in the ‘crutch’ or ‘breech’ area resulted in extra costs due to crutching and remedial action for associated staining problems.

The breech area is one of the major predilection sites for blowfly strike referred to as ‘breech strike’. The main predisposing factors for breech strike are excessive wool resulting in urine
staining and faecal soiling or dags, excessive wrinkles in the breech area resulting in excessive moisture in the skin folds with bacterial growth and an odour that is an attractant for the gravid blowfly female to lay eggs.

Crutching will temporarily solve the problem of stained wool acting as an attractant to blowflies. However, because crutching doesn’t fully solve the problem of the moist skin folds a procedure was developed to address this problem – the Mules operation.

The Mules operation

The mules operation was named after its developer, Mr. J.H.W. Mules. It was first demonstrated in 1931 with initial adoption mainly in Mr. Mules’ home state, South Australia. Following lobbying, CSIR (later CSIRO) undertook further development work, which led to wider industry acceptance by the late 30s.

The original operation involved pinching a fold of skin on either side of the perineal area with Burdizzo pincers and cutting the fold off with a knife. This operation was considered not to be painful because of the pressure of the pincers.

Later the Mules operation was extended to remove skin from the tail; this was referred to as the ‘Modified Mules operation.’ The pincers and knife were replaced with blade shears to perform the operation. Morely and Johnston (1984) reviewed the development and evolution of the Mules operation in detail.

In Western Australia, Department of Agriculture staff trained sheep contractors. The mulesing contracting industry, for reasons probably associated with perceived ‘value for money’ by their clients extended the area of skin removal in the crutch area as well as doing a total strip of the tail skin - the so-called ‘Radical Mules Operation’. Apart from welfare concerns, the Radical Mules operation resulted in secondary problems such as a large wound area increasing the chances of infection, secondary joint infections, wound contraction and distortion of the tail and vulva. The longer-term problem of an increase in UV light induced skin cancer of the perineal region also became evident.

Arguments in favour of the Mules operation

1. **Reduced prevalence of breech strikes.**
   In flocks where the sheep genotype has a high level of skinfolds, excessive wool coverage of the perineal region and a high incidence of scouring and dags, mulesing will result in a significant reduction in breech strikes. Mulesing has also been shown to significantly reduce flystrike in Corriedale and crossbred sheep (Reid and Jones 1976).

2. **Pain associated with surgical mulesing is less than that due to flystrike.**
   This is a common argument by the proponents of mulesing, but has merit only in the absence of other options.

3. **Individual sheep inspection and treatment is not possible in the current Australian farming environment.**
   This argument can be supported from a ‘dry economic rationalist’ point of view.

4. **Unmulesed sheep have a higher incidence of flystrike and therefore require more chemical treatments.**
   This is only true if whole-mob preventative treatments are used in situations where they would probably not have been used if sheep were mulesed.
5. **Mulesed sheep present an economic advantage because they**
   - are easier to shear;
   - require less crutching; and,
   - are preferred by buyers.

**Arguments against Mulesing**

1. **General Public Perception**
   “It is a cruel and barbaric procedure”.
   “Farmers should not run more sheep than they can look after”.

2. **Official Government Responses**
   At least one Senate inquiry.
   There is support for research to find an alternative

3. **Non Government Organisations**
   Animal welfare groups, including the RSPCA do not support mulesing and this protest can be expected to escalate. However, RSPCA will generally accept that mulesing for the present is the lesser of two evils.

4. **Scientifically**
   Mulesing is a surgical procedure conducted without any sedation or pain control. A parallel can be argued with the current anti-tail docking debate (and legislation) for dogs.

5. **Trade**
   There is an increasing trend for retailers to stipulate quality assurance procedures and compliance from their suppliers. There is also a growing trend to extend the QA compliance to include ethics and animal welfare. This is a serious threat for those industries exporting prime lamb and woolen products to America and Europe. It would not be surprising if the prime lamb trade to Europe would be the first sector of the sheep industry to be impacted by this development.

**Future options**

1. **Maintain status quo**
   *Status Quo* can not be expected to be sustainable in the medium- to long-term, because the arguments for and against mulesing will evoke an increasingly emotive debate and negative response. It is not possible to propose a logical time frame for when the anti-mulesing debate will prevail. The industry should therefore start now to implement a strategic retreat from surgical mulesing.

2. **Non-genetic options**
   2.1 *Preventive management methods*
   One or more crutching(s) per year, scouring control measures, preventative fly treatments and pasture/feed selection are all factors that can be manipulated to reduce the predisposition to breach strike. These options may or may not result in extra costs. In some cases a simple change in crutching and shearing dates may be sufficient, especially in areas where fly waves are highly predictable annual events.

   2.2 *Non-surgical mulesing*
   Theoretically it should be possible to stop wool producing follicles from growing wool. The first effort along these lines in recent times in Australia was abandoned, as the chemical employed was not considered safe for public use. Currently CSIRO is
investigating a technology which has a local control function on wool follicles. Research at Adelaide University may also provide a possible depilation technique (Hynd, pers. comm.).

3. Genetic options

All of the methods outlined under non-genetic options will involve some cost to farmers and they all require repeated application either every year on the same animals or on each new crop of animals. A genetic solution would represent an accumulative and permanent solution.

Traits to be considered:
♦ A greater wool-free area adjacent to the perineum;
♦ Fewer wrinkles;
♦ Less wool on the points; and,
♦ Reduced scouring and dags.

In relation to bodystrike, and to lesser degree to breech strike:
♦ A lower suint: wax ratio (white wool); and,
♦ Reduced incidence of dermatophilosis and fleece rot.

Also worthy of consideration in an effort to reduce surgical treatments of sheep is a short tail. Many breeds of sheep are naturally short tailed and a genetic defect that confers short tails has been reported in Merinos (James et al. 1990).

The alternative description is ‘a plain body sheep with clean points, good wool and high disease resistance’. This would be an ‘easy care’ sheep. However, the common perception is that this type of animal represents a sheep with a low fleece weight, and this needs to be evaluated. If appropriate alternative procedures are not available, the industry may be forced to make a choice between ‘easy care’ sheep and future wool and sheep meat markets.

From a genetic point of view there is a need to determine the heritability of these traits, the genetic and phenotypic relationships between these traits and with wool production traits. Any adverse correlations can be managed in a multiple trait selection index (e.g., reduced fibre diameter and clean fleece weight). This should be combined with a demonstration flock to enable the practical sheep producer to observe the benefits of farming with ‘a plain body sheep with clean points, good wool and high disease resistance’ type of animal.

Existing genetic information

Information on the amount of wrinkles and wool-free area of the perineum has been recently collected from research flocks in WA (Great Southern Agricultural Research Station) and SA (Turrentfield RS). This data should be analysed to provide preliminary genetic parameters for these traits and their correlation with blowfly strike and production traits.

References

