

SHEEP STANDARDS AND GUIDELINES – MULESING

DISCUSSION PAPER

Prepared by Sheep Standards and Guidelines Writing Group, January 2013

Mulesing is the removal of skin from the breech and/or tail of a sheep using mulesing shears.

ISSUES

The main issues are:

- 1) Age limits before pain relief is required
- 2) Knowledge, experience and skills to perform the task
- 3) Availability of pain relief drugs.

RATIONALE

In 2004 the wool industry agreed that mulesing would be phased out by the end of 2010. Although this is still the long-term goal, there is no longer a fixed deadline. Australian Wool Innovation (AWI) and the Australian Government through matching funding have spent millions of dollars researching alternative methods of breech flystrike prevention, which include: breeding of resistant sheep, anti-flystrike clips, intradermal injections and blowfly control. Whilst progress has been made with alternative controls, there is still a need to mules sheep for effective breech fly strike control in many environments to achieve practical and economically viable breech strike control for optimum sheep welfare management.

Until the practice of mulesing is phased out, mulesing of lambs remains an important husbandry practice in Australia for animal health, welfare and management reasons. The principal reason is to reduce urine and faecal soiling or dag formation in the breech and tail wool and thus minimise susceptibility to breech and tail flystrike. Flystrike is one of the most important welfare concerns for sheep in Australia and Australian sheep farmers are committed to controlling flystrike to ethically acceptable levels. Further background information is contained in a review of mulesing and the evaluation of genetic alternatives by James, 2006.

Currently, cost effective solutions are not available for all types of production systems in Australia and mulesing is a valuable tool for the prevention of breech flystrike for certain production environments and sheep types.

RECOMMENDATIONS

The writing group reviewed the reasons for mulesing and the suitability of alternative breech fly strike control strategies available at the present time in line with the guiding principles for the welfare of sheep. The writing group has concluded that the procedure is currently a valuable tool for the prevention of breech flystrike for certain production environments and sheep types.

A maximum upper age limit of six months to perform the procedure before mandating pain relief is recommended for the following reasons;

- Desirable for sheep welfare – The age limit will reinforce the need to perform the procedure at an early age. Industry communications and extension campaigns aim to promote the recommended guidelines.
- Feasible for the majority of industry to implement - The proposed standard is practical for the diverse range of production systems and environments that exist in Australia and sends a clear message for sheep welfare.
- Feasible for government to implement – An age limit of 6 months causes no impediment for regulation compared with any other age limit. Compliance and enforcement policy will be an important aspect of regulation. Sheep dentition is an unhelpful guide to sheep age at less than one year old. Verification will have to rely upon other measures to establish age.
- Important for the sheep welfare regulatory framework – The current MCOP for sheep states that sheep mulesed at > 6 months old require pain relief and it was considered important to incorporate this requirement into a standard.
- The valid outcome sought is - that mulesing is only done where necessary and in a manner that minimises pain and distress. The age limit will not cause an increase in unnecessary pre-emptive mulesing or a decline in lamb welfare due to mulesing not being able to be done if required.

The writing group recommends that the following standards be introduced into legislation and the following guidelines for good animal welfare practice be published for industry consideration.

PROPOSED STANDARDS AND GUIDELINES

Objective

In circumstances where mulesing is necessary for the long-term welfare of the sheep, it is done in a manner that minimises the impact of the procedure.

Standards

- S7.1 A person performing mulesing must have the relevant knowledge, experience and skills, or be under the direct supervision of a person who has the relevant knowledge, experience and skills.
- S7.2 A person must not mules sheep that are less than 24 hours old or more than 12 months old.
- S7.3 A person must not mules sheep that are 6–12 months old without using pain relief.
- S7.4 A person must not mules sheep showing signs of debilitating disease, weakness or ill-thrift.
- S7.5 A person mulesing sheep must only remove wool-bearing skin.

Guidelines

- G.1 The options for breech strike prevention should be considered before undertaking mulesing including:
 - Selection for resistant conformation
 - Culling susceptible sheep
 - Clips
 - Crutching
 - Timing of shearing
 - Chemicals for flystrike prevention
 - Internal parasite control.
- G.2 Selection for breech flystrike-resistant conformation should include low dag score, low wrinkle score and low breech cover score.
- G.3 In areas prone to high breech flystrike risk, lambs with a high dag score and/or high wrinkle score should be culled.
- G.4 In assessing breech flystrike risk and the need for mulesing, factors that should be considered are:
 - Sheep are at a high risk of breech flystrike on the property on which they are kept

- Lambs are intended to be kept as adult sheep
 - Sheep are likely to be sold and kept as adults in areas prone to breech flystrike.
- G.5 The mulesing operation should only remove sufficient wool-bearing skin appropriate to the conformation of the lamb being treated to achieve flystrike protection.
- G.6 Where mulesing is performed, lambs should be mulesed at 2–12 weeks of age.
- Note: This material that relates to the two husbandry procedures of castration and tail docking and has been written to reflect a single chapter in the document.**
- G.7 Mulesing should only be done where there are no alternatives and the procedure results in:
- Benefits to life-time sheep welfare
 - Better flock management
 - A reduced work (occupational) health and safety risk.
- G.8 Mulesing should be accompanied by pain relief where practical and cost-effective methods are available. Operators should seek advice on current pain minimisation strategies.
- G.9 Good hygiene practices should be practiced in relation to facilities, hands, handling and instruments. Disinfectant should be used and changed frequently.
- G.10 Risk of infection should be minimised by avoiding muddy or dusty yards, and wet or humid weather.
- G.11 Operators should adopt appropriate strategies to minimise the risk and impact of common infections, such as by *Erysipelothrix rhusiopathiae* and *Clostridium tetani*, through vaccination of lambs and/or their mothers.
- G.12 Lambs should be appropriately restrained in a lamb cradle and, when released, should land on their feet to avoid contact of the wound(s) with the ground.
- G.13 Lambs should be separated from their mothers for the shortest possible time.
- G.14 Ewes should be managed to optimise milk production to maximize protein availability for the lamb to aid wound healing.
- G.15 Haemorrhage should be minimised by preventing overheating of lambs and allowing them to settle after mustering.
- G.16 Mulesing should be done when fly activity is minimal, or in conjunction with appropriate preventive flystrike treatment.
- G.17 Sheep should be inspected regularly and with minimal disturbance for signs of post-operative complications during the healing process, and appropriate action taken.
- G.18 After placement in paddocks, lambs should not be forcibly mustered and yarded until wounds are healed.

G.19 Mulesing should be planned with consideration to the age of lambs, weather, staff availability and facilities, including the use of temporary or permanent yards.

G.20 Mulesing should not be undertaken during extreme weather.

AGE OF MULESING

As with other similar husbandry procedures, upper age limits are appropriate for mulesing in order to optimise sheep welfare. It is reasoned that the age limit after which mulesing requires the use of pain relief is consistent with the standards for castration and tail docking. When mulesing is done it is common practice to do this at marking to avoid extra mustering and handling. Six months is a suitable age limit in Australia to accommodate all production systems. The same situation exists for castration and tail docking and is further addressed in those issues papers.

Determining an upper age limit of six months for mulesing lambs involves consideration of the following factors:

- Practical aspects of undertaking the procedure, including suitable weather conditions and labor availability
- Practical limitations of the technique to be used (e.g. the ability to handle and restrain the sheep)
- The length of the joining period which will result in varying birth dates. Mustering lambs with a wide range of ages can increase the risk of mis-mothering in very young sheep
- The necessity to undertake other sheep husbandry procedures at the same time.

ABILITY TO PERFORM THE REQUIRED TASK

A person must have knowledge, experience and skills to perform a general husbandry task in a manner that minimises the risk to the welfare of the animal. This matter is regarded as highly important by the sheep industry. A level of assurance is sought commensurate with the degree of immediate welfare risk to the animal. Formal assessment of ability is not required.

This includes:

- Reducing the impact of mustering, handling and restraint
- Carrying out the procedures at the earliest practical age
- Knowledge of the appropriate age/size considerations for selection of method
- Ensuring that facilities and instruments are suitable
- Applying the method skilfully
- Applying other basic principles such as vaccinating ewes and lambs to protect against tetanus and other clostridial diseases
- Avoiding wet weather
- Maintaining clean hygienic practices
- Allowing the lambs to mother up as soon as possible
- Releasing the sheep from the yards and onto feed and water as soon as possible
- Conducting regular post-mulesing inspections.

The most important elements to be considered are:

- Demonstrated manual skill
- Appropriate hygiene
- Use and care of instruments.

There is a national industry training program for mulesing operators.

Where mulesing continues to be done, it is important that it is done according to agreed best practice. The National Mulesing Assurance Program is currently available for livestock contractors and producers to ensure best practice techniques are carried out and are in compliance with the *Model Code of Practice for the Welfare of Animals – the Sheep*.

PROVISION OF PAIN RELIEF FOR MULESING

The term ‘pain relief’ is used throughout this document to mean the reduction of behavioural and physiological responses by an animal to a painful stimulus to a level judged to be reasonable. Currently pain relief products that could be used in conjunction with mulesing are only available through a veterinarian. The most widely used product is Tri-Solfen, which is an S4 drug available only under prescription from veterinarians. There are no non-steroidal anti-inflammatory drugs that are currently registered for sheep in Australia.

Recent scientific research has examined strategies for pain relief for mulesing and the effectiveness of these approaches.

The first paper published was by Paull *et al* 2007 and examined the behavioural and physiological stress responses of lambs mulesed with either no additional treatment, or with the application of a topical anaesthetic formulation, systemic flunixin and carprofen, singly or in combination. Flunixin and carprofen are non-steroidal anti-inflammatory drugs and were injected before mulesing. The commercial topical anaesthetic formulation (Tri-Solfen) contained the local anaesthetic agents lignocaine and bupivacaine. Lambs mulesed with no drug application exhibited large increases in the stress-responsive hormone cortisol, reduced lying and increased standing with a hunched back compared with unmulesed lambs.

In the study by Paull *et al* 2007 topical anaesthetic reduced the cortisol peak occurring 30 minutes after and reduced hunched standing for four to eight hours after mulesing compared with mulesing with no drugs, but generally did not result in values equivalent to unmulesed sheep. Carprofen, flunixin, and carprofen + flunixin treatments did not reduce the cortisol response to mulesing but substantially ameliorated some changes in behavioural postures. Flunixin + topical anaesthetic reduced the cortisol peak following mulesing and substantially ameliorated most changes in behavioural postures. Carprofen + topical anaesthetic abolished the cortisol peak following mulesing and substantially ameliorated most changes in behavioural postures. The authors assessed that the topical anaesthetic formulation applied immediately after the mulesing cut provided some benefits, but that a combination of non-steroidal anti-inflammatory drug (carprofen) and topical anaesthetic would be required for full pain relief.

A subsequent study was published by Lomax *et al* 2008 in which three experiments were conducted on merino lambs, examining mulesing with and without the application of the commercial topical anaesthetic preparation (Tri-Solfen). The authors examined lamb responses by behaviour scoring and by touching the exposed wound surfaces with microfilaments and scoring the sheep response. The results showed that the application of the topical anaesthetic significantly reduced the sheep responses to wound touching and also reduced behaviour scores in mulesed sheep in the four to eight hours after mulesing. In the second experiment, in which an unmulesed control group was used, the behaviour scoring points at five min, one hour and four hours post-mulesing showed that

the mulesed sheep treated with the topical anaesthetic did not differ in their behaviour scores from unmulesed lambs.

Paull et al 2008 examined the potential of several widely used non-steroidal anti-inflammatory drugs (NSAIDs) and other drugs analgesics to reduce pain and stress in sheep after surgery. Mulesing involves a greater degree of tissue trauma than other surgical husbandry procedures such as castration or tail-docking and it provides a more rigorous and conservative test to identify potentially useful pain relief strategies in sheep. Merino lambs (5 weeks of age) were randomised into eight treatment groups: (1) carprofen; (2) flunixin; (3) ketoprofen; (4) buprenorphine; (5) xylazine; (6) lignocaine epidural; (7) saline control; (8) sham control. The NSAIDs were administered 1.5 h before mulesing, buprenorphine 0.75 h and xylazine and lignocaine 0.25 h before mulesing. Pain- and discomfort-related behaviours were recorded for 12 h after mulesing, and plasma cortisol concentrations were measured before mulesing and 0.5, 6, 12, 24 and 48 h after mulesing. The results indicated that no single pain relief treatment provided satisfactory analgesia during both the surgical mulesing procedure and the ensuing period of pain associated with the inflammatory phase. However, there were indications that two NSAIDs (carprofen and flunixin) showed good pain relief potential during the inflammatory phase. Paull et al 2008 concluded that a combination of short- and long-acting pain relief drugs may be needed to provide more complete pain relief. The administration of some NSAIDs offers the potential for good analgesia in sheep for the inflammatory phase following the tissue trauma of surgical husbandry procedures. Other pain relief options need to be considered if the acute stress response to the procedure is to be reduced.

Taken together, these studies suggest that it is possible to achieve pain relief in conjunction with mulesing, but this would be most effectively achieved through a combination of approaches such as the pre-mulesing administration of systemic pain relief followed by a post-mulesing application of topical anaesthetic.

Drugs are the common means by which pain relief is achieved and they act in various ways on the peripheral and central nervous systems and may be applied topically or by injection. The range of drugs available for use in sheep and the effectiveness and duration of pain relief provided is often limited.

The assessment of pain is an inexact science. The types of pain and their perception are often not understood and are known to vary at different ages and between individuals. In considering the use of pain relief, sheep should be given the benefit of the doubt.

PROGRESS WITH ALTERNATIVE BREECH FLY STRIKE CONTROLS

Australian Wool Innovation held a Wool R&D Technical Update on Breech Flystrike Prevention in Sydney on the 1 August 2012¹. Attendees were given the opportunity to hear about the latest developments and significant issues facing the sheep industry in regards to breech flystrike and comparing flystrike control programs and prevention options. Currently there are no significant premiums or discounts for mulesing status of wool. Chemical prevention, crutching and breeding are the most used combination 'alternative' to date.

Industry experts presented a range of issues including breeding for flystrike resistance and flystrike indicator traits. Overall, genetic progress is slow but steady with a timeframe of many years to complete solutions in breeding. The most important determinants of breech strike risk are breech

¹ http://www.wool.com/Grow_Animal-Health_Flystrike-prevention_Technical-RnD-update.htm

wrinkle and dag (in high rainfall areas). Other factors that can increase the risk of breech strike include breech cover, yellow wool and urine stain. Some interesting points from recent studies were:

- Males commonly had a higher strike level
- Dag management can be very complicated with significant variation between locations
- Breech strike risk itself is very heritable
- The current wrinkle score system is adequate
- Sheep with fewer wrinkles produce more lambs
- Selection of fly strike resistance can still maintain fleece characteristics.

Occlusive plastic clips have been specially designed to be applied to loose breech skin, resulting in the eventual death of the skin due to diminished blood supply. The end result is less skin in the breech area but Tyrell, Larsen and Anderson in 2012 concluded from a three-year trial that to effectively control breech strike in south eastern Australia (high dag risk), clipped sheep should be treated as if they were unmulesed. Clips do not achieve the same degree of remodelling possible with surgery and will have limited application in lower risk situations. Clipped sheep were intermediate in terms of the time and effort to crutch (removal of breech wool and dags).

SkinTraction® is a system of needle-less injection of a common chemical, sodium lauryl sulphate to destroy breech skin resulting in less wrinkle in the breech area. The use of Skin Traction will have many prerequisites before use (such as; operator training and treatment only of lambs greater than 30 kg live weight lambs). The technology is still in the development phase and the method is seeking APVMA registration. Its eventual application may be specialised as most lambs are marked and mulesed when young and small.

The sheep Cooperative Research Centre FlyBoss program² is useful in the risk management of fly strike. The website is an excellent resource to assist sheep breeders plan a non mulesed sheep management strategy.

Tail length and tail docking have relevance in terms of breech hygiene and dag formation. There is a separate discussion paper on tail docking.

REVIEW OF NATIONAL POLICIES AND POSITIONS

The mulesing appendix of the Model Code of Practice for the Welfare of Animals – the Sheep was updated in 2006 and much of the content is relevant and has been incorporated in the drafting the new standards and guidelines.

In particular the MCOP states; “mulesing over 6 months must be done with anaesthesia.” and; “sheep must not be mulesed after 12 months of age.”

The **Australian Veterinary Association** (AVA) position on mulesing is that:

10.6 Surgical mulesing

Position Statement

The Australian Veterinary Association (AVA) strongly supports the sheep industry’s decision to cease surgical mulesing by the end of 2010.

² <http://www.flyboss.org.au/>

Until mulesing is ceased:

- *All lambs being mulesed should be treated with approved analgesics to minimise the pain associated with the procedure*
- *Operators carrying out the mulesing procedure should be accredited*
- *The appendix on mulesing in the Model Code of Practice for the Welfare of Animals: The Sheep is recognised by the AVA as a sound basis for mulesing practice.*

Blowfly strike is a serious animal welfare concern. Alternative methods of fly strike management and blowfly control that do not involve surgical removal of skin from the breech region are available and should be used and further developed.

Ratified by the AVA Board: 18 June 2009

RSPCA Australia 2008 relevant policy is as follows:

4.6 Invasive animal husbandry procedures

"4.6.1 RSPCA Australia is opposed to any invasive animal husbandry procedure for which there is no established need, which only benefit the human handler of the animals concerned, or that is performed to overcome the adverse effects upon animals of the production system they are in.

4.6.2 If an invasive procedure is to be performed, it must be undertaken at the earliest age possible, be performed by an accredited operator and be accompanied by appropriate pain-relieving and / or pain-preventing products."

The RSPCA Australia position paper B4 on 'Invasive farm animal husbandry procedures' (2009) states:

9 Mulesing of sheep

"Mulesing is the removal of wool-bearing skin from part of the tail and breech area of sheep used in wool production and is performed to reduce the incidence of fly-strike in the breech area.

9.1 Mulesing should not be performed if alternative safe and humane management procedures can overcome the danger of fly-strike. Radical mulesing, in which all skin is removed from the tail and the cuts of the tail and crutch operations join so that no wool grows between them, must never be performed as it causes considerable pain and suffering and exposes the skin and perineal area to sunburn which increases the risk of cancer.

9.2 Until mulesing is phased out, routine mulesing of lambs must only be performed where it has been established for a particular geographical location that only by this animal husbandry procedure will the probability of fly-strike be minimised.

9.3 Mulesing must only be performed by an accredited person on an appropriately restrained lamb less than 10 weeks of age (see 2.6) and using a pain-relieving product on the wound immediately after mulesing.

9.4 Mulesing of older lambs is considered a major surgical procedure and must only be performed under anaesthetic by a veterinary surgeon. Analgesia and appropriate post-operative procedures must be instituted to ensure rapid healing.

9.5 RSPCA Australia strongly supports the selection and breeding of fly-strike resistant sheep and other alternatives to mulesing as a means of reducing the incidence of fly-strike in the breech area.

9.6 Lambs which will be sold at an early age for meat must not be mulesed”.

In a letter to Woolproducers Australia dated 12 September 2008 RSPCA Australia wrote the following:

“RSPCA Australia encourages the use of a topical anaesthetic post-mulesing however we do not support the continuation of mulesing with pain relief beyond 2010 – we expect the deadline to be met and viable alternatives will be in place.”

In December 2009, RSPCA Australia released a research report titled ‘Prevention and control of flystrike’ which examines measures to prevent flystrike in the absence of mulesing. It is available at <http://kb.rspca.org.au/files/4/>.

REVIEW OF INTERNATIONAL POLICIES AND POSITIONS

The **New Zealand Painful Husbandry Procedures Code (2005)** does not address the mulesing procedure. The NZ merino industry considers that including mulesing in the code would be inconsistent with their agreed strategy of moving away from the procedure. The practice remains covered by the *Code of Recommendations and Minimum Standards for the Welfare of Sheep*; however it is not included in Animal Welfare (Sheep and Beef Cattle) Code of Welfare 2008 Public Draft which will replace the Code of Recommendations and Minimum Standards. The NZ merino industry has decided that mulesing will cease by 2010. It must be noted that that the risk of flystrike in New Zealand merino flocks is less than in Australian flocks due to the variation in the climate and production systems.

The procedure is not known to be done in other countries that publish animal welfare policies and regulations.

DEFINITIONS

direct supervision	<p>A person (the supervised person) is acting under the direct <i>supervision</i> of another person (the supervisor) if the supervisor:</p> <p>(a) provides instructions and guidance to the supervised person in relation to the subject activity; and</p> <p>(b) oversees and evaluates the performance of the activity by the supervised person; and</p> <p>(c) is contactable by the supervised person; and</p> <p>(d) is supervising the person in accordance with paragraphs (a), (b) and (c) above; and</p> <p>(e) is on the same premises as the supervised person while the subject activity is being undertaken; and</p> <p>(f) is able to immediately render assistance to the supervised person, if required, at any time during which the subject activity is being undertaken.</p>
mulesing (mules, mulesed)	The removal of skin from the breech and / or tail of a sheep using mulesing shears.
mulesing shears	Specially set shears with rounded points and sharp blades.
pain relief	The administration of drugs that reduce the intensity and duration of a pain response.
skin	The full thickness of the skin including the wool follicles and does not include sub-dermal tissue such as selvage (muscle fascia), muscle or other underlying tissue.

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