

SHEEP STANDARDS AND GUIDELINES – CASTRATION

DISCUSSION PAPER

**Prepared by the Sheep Standards and Guidelines Writing Group, January
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Castration is the removal or disruption of the function of the testes by excision, or by constriction and/or crushing of testicular blood supply (rubber ring, burdizzo clamp).

ISSUES

The main issues are:

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

RATIONALE

Castration remains an important procedure for sheep husbandry and on-farm management of male sheep in Australia. The reasons for castration include:

- Reduced aggression and sexual activity
- Easier and safer to handle and manage
- Less likely to fight, reducing bruising and injuries to themselves and other sheep
- Easier to keep in paddocks after the time that sexual maturity would be reached
- Allows for management flexibility to finish lambs to meet market specifications under variable seasonal conditions
- Allows other husbandry practices (e.g. shearing) to be undertaken more quickly, efficiently and safely
- Prevention of unwanted mating and pregnancies, particularly with the risk of dystocia in maiden ewes
- Wethers grow a finer wool quality than rams
- Ease and efficiency of processing (significant increase in the cost to producer for the processing of entire males)
- Improved meat quality in sheep.

RECOMMENDATIONS

The writing group reviewed the reasons for castration and the methods used and has concluded that castration is a widely required husbandry procedure for male sheep in Australian production systems. Circumstances will dictate the choice of method, no one method being ideal in all circumstances. All methods are associated with a degree of pain and there is conflicting scientific opinion on which method has a lesser impact on the animal's welfare at recommended ages for castration. Appropriate pain relief should be used but the writing group acknowledged that this is difficult to deliver for sheep. The requirement for pain relief will practically prevent the practice beyond the age limit proposed (six months) for commercial sheep enterprises because of the restrictions involved in applying pain relief.

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. For most large scale sheep enterprises the requirement for pain relief effectively prohibits the procedure beyond the specified age.
- Feasible for government to implement – An age limit of six 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 castrated at more than six months old require pain relief and it was considered important to incorporate this requirement into a standard.
- The valid outcome sought – Is that castration 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 castration or a decline in lamb welfare due to castration 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

Castration is done only when necessary, and in a manner that minimises the risk to the welfare of sheep, particularly pain and distress.

Standards

- S6.1 A person performing castration 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.
- S6.2 A person must not castrate or use the cryptorchid method on sheep that are more than six months old without using pain relief and haemorrhage control.

Guidelines

- G.1 Lambs destined for slaughter before 12 weeks old, or the onset of puberty, should not be castrated.

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.2 Castration 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.3 Castration should be done after a secure maternal bond has been established, and after the lambs are 24 hours old.
- G.4 Lambs should be castrated or made cryptorchid as young as possible and before they are 12 weeks old.
- G.5 Castration should be planned with consideration to the age of lambs, weather, staff availability and facilities, including the use of temporary or permanent yards.
- G.6 Good hygiene practices should be practiced in relation to facilities, hands, handling and instruments. Disinfectant should be used and changed frequently.
- G.7 Infection should be minimised by avoiding muddy or dusty yards, and wet or humid weather.

- G.8 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.9 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.10 Lambs should be separated from their mothers for the shortest possible time.
- G.11 Haemorrhage should be minimised by selecting an appropriate method, preventing overheating of lambs and allowing them to settle after mustering.
- G.12 Castration should not be undertaken during extreme weather.
- G.13 Castration should be done when fly activity is minimal, or in conjunction with appropriate preventive flystrike treatment.
- G.14 Sheep should be inspected regularly and with minimal disturbance for signs of post-operative complications during the healing process, and appropriate action taken.
- G.15 Castration should be accompanied by pain relief when practical and cost-effective methods become available. Operators should seek advice on current pain minimisation strategies.
- G.16 Ewes should be managed to optimise milk production to maximize protein availability for the lamb to aid wound healing.
- G.17 After placement in paddocks, lambs should not be forcibly mustered and yarded until wounds are healed.

METHODS OF CASTRATION

The most common methods of castration of lambs in Australia are by:

- Rubber rings
- Cutting (lamb-marking knife).

The Australian MCOP for sheep states that cutting and the application of rubber rings are acceptable methods of castration of lambs less than six months old, without anaesthetic.

In a comprehensive review of the impact of different castration procedures for lambs, and the options for analgesia, Mellor and Stafford (2000) concluded that knife castration without analgesia caused the maximum welfare impact of all methods, and that the application of rubber rings was preferable. Subsequent research (Mellema et al 2006; Melches *et al* 2007, Paull et al 2009) has not altered the relevance of this conclusion. Grant 2004 has shown that all treatments involving rubber rings resulted in significant abnormal posture and active pain behaviour displays. Lomax *et al* 2010 also reported lambs castrated and tail docked by rings exhibited behaviours indicative of intense pain and severe distress which were greater than that caused by other treatments including surgery.

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Paull et al 2009 concluded that: where some previous research has concluded that ring castration produces more active behavioural changes in the animal than other methods, most of those conclusions were made following behavioural assessments with minimal physiological data. Studies involving cortisol, haptoglobin, haematology, active behavioural responses and growth parameters provide a clearer picture of the overall animal response.

Taking all these factors into account, ring castration can be considered to have a lesser impact on the animal's physiological state than knife castration, the other widely used method of castration for sheep in Australia.

Closed crushing methods (i.e. Burdizzo clamps) are rarely used in Australia, due to the high degree of technical difficulty and therefore reduced success with large numbers of sheep.

Non-castration and cryptorchidism has a lesser role in the highly variable production systems in Australia. Immuno-castration is currently unavailable as no vaccine is licensed for use in sheep in Australia.

AGE OF CASTRATION

The earlier the procedure is done in entire lambs the better (Mellor and Stafford 2000). International viewpoints are moving towards reductions in the age threshold above which the application of anaesthesia/analgesia should be required. The Australian MCOP for sheep states that "where castration is required, it should be done on lambs as early as management practices will allow, preferably before twelve weeks and sheep older than six months require an anaesthetic."

Early castration significantly reduces:

- Pain and discomfort
- Risk of bleeding and infection
- Recovery time after castration
- Weight loss after castration
- Difficulty of restraining the lamb and performing the procedure
- Risks to the operator and the amount of labour needed.

Castrating lambs too young can present issues of mis-mothering and injury.

Determining an upper age limit of six months for castration without pain relief involves consideration of the following factors:

- The desirability to undertake castration before the onset of puberty which varies according to genotype, nutrition, liveweight and season
- Practical aspects of undertaking the procedure, including suitable weather conditions, labour availability
- The length of the joining period 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 husbandry procedures at the same time.

New Zealand has documented a similar discussion in paragraph 38 of the Animal Welfare (Painful Husbandry Procedures) Code of Welfare Report 2005.

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-castration inspections.

The most important elements to be considered are:

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

PROVISION OF PAIN RELIEF FOR CASTRATION

There are no effective analgesic drugs generally available to non-veterinarians for castration. Currently analgesic products that could be used in conjunction with castration are only available through a veterinarian. There are no non-steroidal anti-inflammatory drugs that are currently registered for sheep in Australia.

The extensive review by Mellor and Stafford (2000) indicated that the most successful analgesic strategy for castration using local anaesthesia required the injection of local anaesthetic into the scrotal neck, both spermatic cords and both testes, 15-20 minutes before ring castration. This procedure resulted in physiological stress responses not different to that of control animals. However, it was recognized that this process would not be practical for general farm use in young lambs. The study suggested that a more practical alternative for local anaesthetic administration involved injecting local anaesthetic into the scrotal neck 15-20 seconds before applying a ring to the scrotum. This procedure resulted in only mildly elevated stress responses.

In a recent experimental paper, Mellema *et al* 2008 found that local anaesthetic infiltration by injection into each spermatic cord and around the scrotal neck resulted in good pain relief for both ring and burdizzo castration 5 minutes later. Needleless injection systems have also been used under experimental conditions for this procedure with some success (Kent *et al* 1998), but are not widely available or used.

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Paull et al 2009 found that knife-castrated lambs had higher peak cortisol and integrated cortisol responses for the first 6 hours after treatment and greater concentrations of circulating acute phase proteins than ring castrated lambs, both of which were significantly different from sham controls. Tri-Solfen applied to the knife castration wound significantly reduced both the peak plasma cortisol concentration and the integrated cortisol response for the first 6 hours and improved lying behavior in the first 12 hours. Carprofen reduced the cortisol response to knife castration at 30 minutes, but elevated the cortisol responses at 24 and 48 hours. Carprofen nearly halved the number of acute pain behaviours associated with ring castration. There were no significant additive or synergistic effects from combining the analgesic treatments. Tri-Solfen applied to the tail would provide no detectible benefits during ring castration and ring tail docking.

These authors also agreed that the physiological and behavioral responses suggest that ring castration has less impact on the lamb than knife castration at a mean age of five weeks old. The specific analgesic treatments used can provide modest amelioration of the pain and discomfort associated with castration (carprofen injection for ring castration and Tri-Solfen for knife castration) and alternative doses or application methods may enhance their efficacy.

Local anaesthetic infiltration has also been examined in conjunction with knife castration, but its effectiveness appears to be somewhat more variable than when used in conjunction with ring castration. Melches *et al* 2007 examined lamb responses to ring, burdizzo or knife castration following local anaesthetic injection. The lambs castrated by knife were assessed by the experimenters as exhibiting the strongest behavioural reactions after castration, with burdizzo-castrated lambs the lowest, and ring application being intermediate.

The published international literature includes research on topical anaesthetic application following tail docking, but not castration. Topical anaesthesia could be of benefit in conjunction with knife castration through application to cut surfaces. Lomax *et al* 2010 reported on the beneficial results from the use of Tri-Solfen for surgical castration and surgical or hot iron tail docking, with significant pain reduction from the first minute and for up to four hours.

The administration of non-steroidal anti-inflammatory and other analgesic drugs may be of additional benefit in providing pain relief for castration of lambs (Molony *et al* 1997), but the lack of registration for sheep precludes their widespread use.

REVIEW OF NATIONAL POLICIES AND POSITIONS

The **Sheep MCOP** section 9.4 on castration suggests that *'castration may be unnecessary if all lambs are to be marketed for slaughter prior to puberty, which generally occurs at an age of three to six months. Where castration is required it should be performed on lambs as early as management practices will allow, preferably before 12 weeks. Animals older than six months require an anaesthetic'*. There is no clear mandatory statement on age limits for pain relief.

The sheep MCOP does not in effect create a standard, despite the reference to other legislation in various states. Existing regulations poorly mandate the age at which veterinary intervention or the application of analgesia is required for castration. It is apparent that a standard for the provision of effective analgesia for sheep castration does not exist in all states and Territories.

The **Australian Veterinary Association** (AVA) accepts the practice of castration of lambs under 3 months of age provided that; the operations are performed by a skilled operator, using accepted industry practices. The AVA considers that the castration of sheep older than 3 months should be treated as a major surgical procedure using appropriate analgesia or anaesthesia.

Castration of livestock by surgical means is the current preferred option (unless there are safe, consistent and reliable alternatives) and should be performed with anaesthetic and/or analgesia. When pain relief is not possible castration should be performed as early in an animal's life as is practical and safe.

Ratified March 2010.

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:

4 Castration

"Castration is carried out to reduce aggression and subsequent injury of male animals.

4.1 RSPCA Australia believes that castration must only be undertaken where there is a clearly established need. There is no such need to castrate animals which are destined for slaughter prior to sexual maturity e.g. piglets, lambs or calves.

4.2 It is strongly advised to castrate animals at an earlier age than the maximum age indicated, provided the testicles have descended.

4.3 The use of pain relief and anaesthesia for castration should reflect the method used. Surgical methods of castration are the most painful at the time of application while recovery from rubber ring castration is more prolonged.

4.5 Juvenile males

*Acceptable methods of castrating juvenile males of all species (i.e. calves less than four months, **lambs less than 10 weeks**, goats less than 6 weeks, pigs less than 4 weeks) are:*

- *Rubber rings (these are unsuitable for calves over 2 weeks of age, pigs and goats). A pain-relief product is required. Vaccination against tetanus should be given. In **very young lambs**, i.e. less than 1 week of age, the combined use of an emasculator (an instrument that clamps and crushes the spermatic cord and blood vessels) and rubber ring is more humane than the use of rubber rings alone.*

- *Blade. An anaesthetic and a pain-relief product are required. The animal must be appropriately restrained (see 2.6), and adequate post-operative drainage is essential.*

4.6 Older males

a. Castration of older farm animals is considered a major surgical procedure and must only be performed by a veterinary surgeon.

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b. Where castration is necessary, it should be done in a location that is suitable for the implementation of hygienic methods and the animal should have adequate pre-operative preparation and pain management. General anaesthesia, or sedation plus local anaesthesia, together with appropriate restraint of the animal are required (see 2.6).

c. Post-operative monitoring, pain management and care must be implemented to minimise the possibility of complications”.

REVIEW OF INTERNATIONAL POLICIES AND POSITIONS

These policies and position statements are included to provide a brief international context, while acknowledging that Australia’s sheep production systems may vary significantly from production systems, sheep breeds and climatic conditions in other countries.

In **New Zealand** the relevant standards are contained in the NZ *Painful Husbandry Procedures Code (2005)* which requires in Minimum Standard No.3 in part that: “*castration or shortening of the scrotum without pain relief must be performed when the animals are young as possible, but not greater than six months of age. When castrating or shortening the scrotum of any animal over the age of six months pain relief must be used*”.

Detailed instructions are also included on how the techniques must be performed. Recommended best practice and general information is provided. In this code it is acknowledged that for acute pain, scientific research has shown that the least to most painful methods for lambs are:

- Rubber ring with local anaesthetic
- Shortening of the scrotum
- Rubber ring without pain relief
- Surgery without pain relief.

In the **United Kingdom**, the Mutilations Regulations permit in Schedule 5 - castration subject to the following; rubber rings may only be used on animals aged not more than 7 days; when any other method is used, an anaesthetic must be administered where the animal is aged 3 months or over. The procedure must be done in hygienic conditions and in accordance with good practice.

UK Farm Animal Welfare Council (FAWC) 2008 observes that the current maximum allowable age in the UK for rubber ring castration of 7 days was probably established in the 1950s when there was prevailing belief that all neonates did not feel pain.

The UK FAWC 2008 report recommends that ideally all male lambs are either not castrated or, when this is necessary as part of a farm’s health and welfare plan, castrated using pain relief. Lambs should be castrated as early as practically possible after a secure maternal bond has established, but not usually before they are 24 hours old. Castration above three months old should only be undertaken by a veterinarian using pain relief. Surgical castration should be prohibited except when performed by a veterinarian using pain relief.

The **Canadian Recommended Code of Practice** recommends that castration is performed as early as management procedures will allow after the lamb has received colostrum and before seven days of age. Castration over three months of age should only be done by a veterinarian using appropriate analgesics and anaesthetics.

DEFINITIONS

castration	<p>The removal or disruption of the function of the testes by excision, or by constriction and / or crushing of testicular blood supply (rubber ring, burdizzo clamp).</p> <p><i>Note:</i> Immuno-castration is not included in this definition but is not a welfare concern.</p> <p><i>Note:</i> For the purpose of this document cryptorchidism is effectively considered to be castration.</p>
cryptorchidism	<p>Where the scrotum is shortened by the application of a rubber ring. This results in the testes being held closer to the body and the sheep becoming sterile due to a higher testicular temperature and disrupted sperm production.</p>
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> <ul style="list-style-type: none">(a) provides instructions and guidance to the supervised person in relation to the subject activity; and(b) oversees and evaluates the performance of the activity by the supervised person; and(c) is contactable by the supervised person; and(d) is supervising the person in accordance with paragraphs (a), (b) and (c) above; and(e) is on the same premises as the supervised person while the subject activity is being undertaken; and(f) is able to immediately render assistance to the supervised person, if required, at any time during which the subject activity is being undertaken.
pain relief	<p>The administration of drugs that reduce the intensity and duration of a pain response.</p>

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