

Fact sheet

Pain mitigation for castration in beef cattle in southern Australia

The provision of pain relief with routine husbandry practices is now an expectation. Not only do producers need to consider the use of pain relief products in their animals, but also alternative husbandry procedures and management practices. This fact sheet outlines available products, their costs and when they are suitable to use, as well as best practice recommendations for castration in beef calves.

A note on the cost: benefit of pain relief in cattle.

While pain experienced during well carried out routine husbandry procedures may result in decreased feed intake in the short-term, animals generally compensate. Subsequently, 2–4 weeks later there is no measurable benefit from pain relief. The benefit for producers in using pain relief during routine husbandry procedures is not only for their own peace of mind, but also in meeting consumer expectations and therefore protecting the product they market. Where producers engage in quality assurance programs that require pain relief as part of these programs, specific financial benefits may accrue to individual producers.

Registered products available for routine animal husbandry use in cattle

There are currently two products on the market that have pain relief claims in cattle. In addition to these, there are over 30 other injectable Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) that can be obtained from a veterinarian and while not covered in detail here, include Flunixin, Ketoprofen, Tolfenamic acid, and other Meloxicam registered products.

The two products are:

- **Tri-Solfen** (Bayer Australia) – local anaesthesia, post-op
- **Ilium Buccalgesic OTM** (Troy Laboratories, meloxicam) – NSAID

Tri-Solfen[®] is a topically applied combination agent that includes lignocaine, bupivacaine, adrenaline and cetrimide. It was initially registered for treatment of sheep undergoing surgical mulesing, and its use has been extended to include other painful procedures and conditions, in both sheep and cattle. It's applied to wounds, so is a post-operative product for routine animal husbandry procedures. It is an S5 drug so it's available over the counter from major distributors directly to farmers. Current costs are approximately \$780 for 5L or \$2,620 for 20L (86c for a 6ml dose, \$1.29 for a 9ml dose).

Trisolfen dosages and costs by procedure: Calves

| Weight kg | Dose ml | Cost \$ |
|-----------|---------|---------|
| 30-100 | 6 | 0.86 |
| >100 | 9 | 1.29 |

Buccalgesic[®] is a meloxicam (NSAID) gel that is administered by oral application in the buccal (cheek) pouch in either lambs or calves, rather than drenching for the animal to swallow.

At present, it is available in a 200ml pack costing approximately \$80–100, or 40c/20kg for calves. It is an S4 drug so it has to be purchased from a veterinarian.

It should be noted that the label on Buccalgesic reads, "For alleviation of pain associated with the routine husbandry procedure of castration in calves, in conjunction with local anaesthetic at the surgical site".

Buccalgesic 10mg/ml meloxicam dosages and costs

| Cattle (0.5 ml/10kg) | | |
|----------------------|---------|---------|
| Weight kg | Dose ml | Cost \$ |
| 30 | 1.5 | 0.60 |
| 40 | 2.0 | 0.80 |
| 50 | 2.5 | 1.00 |
| 60 | 3.0 | 1.20 |

Prices quoted are approximate, and may vary from region to region and with supplier and quantity purchased. S4 vet only drugs (NumOcaine, Buccalgesic and Metacam) can only be sold to clients and prices are likely to vary depending on client relationship and volume.

Local anaesthetics versus NSAIDs

Pain is sometimes classified as **immediate** (fast) pain, and **chronic** (slow) pain. During painful animal husbandry procedures there may be immediate pain associated with the procedure, as well as slower long-term pain associated with any injury and healing.

In general, **local anaesthetics** deal with immediate pain, making the animal more comfortable while the procedure occurs and shortly after. Generally, local anaesthetics are immediate and short-acting, lasting for less than one hour. They provide a high degree of analgesia (pain relief) during that period, but no pain relief once they wear off. NumOcaine uses a short-term local anaesthetic (lignocaine), so will only provide any level of analgesia for less than one hour. Tri-Solfen contains two local anaesthetics, lignocaine and bupivacaine (a longer acting local anaesthetic), as well as adrenaline, and appears to provide longer analgesia, with decreased wound pain up to 24 hours reported following castration in cattle (Lomax and Windsor, 2013).

NSAIDs reduce inflammation, pain and fever. They stop the transmission of pain signals by blocking the synthesis of prostaglandins. They have been used in people (e.g. Nurofen, Voltaren) and cattle (e.g. flunixin, meloxicam injections) for years. NSAIDs take 15–30 minutes to take effect, and generally provide pain relief for at least nine hours, but often longer.



The Australian Animal Welfare Standards and Guidelines for Cattle stipulate that good husbandry principles include:

- “assessment of the need to undertake any husbandry procedures that may result in significant short-term pain against alternative strategies for the long-term welfare of the sheep/cattle.”
- “undertaking of any husbandry procedures required for planned flock herd management in a manner that reduces the impact of these procedures and minimises risks to cattle welfare.”

Specifically for beef producers:

- “G6.2 Surgical procedures should be done with pain relief. Operators should seek advice on current pain minimisation strategies.”

Take home message

Most pain relief products help with some of the pain an animal experiences, but not all. Using a combination of products will provide greater pain relief. **Local anaesthetics** provide relief from immediate pain, but are short-acting. **NSAIDs** provide a longer duration of pain relief but do not deal well with the immediate pain.

Application of pain relief for castration in beef calves

For ring castration, local anaesthetics have been effective at decreasing behavioural and cortisol responses, suggesting this is an effective method to decrease or eliminate short-term pain.

Buccalgesic did not result in any benefit in the first hours following ring castration in a NZ study. However, a Canadian study in dairy calves where oral meloxicam was given two hours prior to either ring or surgical castration reported pain relief for up to three days.

For surgical castration, local anaesthesia has not resulted in substantial analgesia. However, Tri-Solfen sprayed onto the spermatic cords and cut edges of the scrotum reduced pain-related behaviour, and the development of hyperalgesia of the wound site was lessened. Meloxicam provides some pain relief, but Buccalgesic is only registered for pain relief with castration in calves when combined with local anaesthesia, which is not currently available for cattle unless administered by a veterinarian.



Alternate husbandry practices

Producers should always consider whether there is a need to undertake painful husbandry procedures on their animals or if there are suitable alternatives.

Castration is a routine procedure in almost all southern Australian commercial beef herds. This is due to the age of turn-off for most steers, issues around safe handling, effects on eating quality, processing and managing large numbers of entire males. Due to this, an established pathway for commercial beef production with entire males does not exist at present.

Summary

- Castration in beef cattle in southern Australia is a routine animal husbandry procedure that results in pain at the time it is performed.
- Use of rubber rings/banding is likely to result in less pain than surgical castration.
- There is insufficient research to be sure of the best form of pain relief.
- NSAIDs (meloxicam or flunixin) should provide pain relief for longer-term chronic pain but do not appear to be effective for the initial immediate pain.
- Tri-Solfen should provide pain relief if surgical castration is necessary.
- Leaving male animals entire is not an established pathway for commercial beef production.

Further reading

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Lomax, S and Windsor, PA (2013). Topical anesthesia mitigates the pain of castration in beef calves. *J Anim Sci*; 91:4945-4952

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