

Fact sheet

Pain mitigation in sheep and cattle

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.

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

While pain experienced during routine husbandry procedures may result in decreased feed intake in the short-term, animals generally compensate and 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 protecting the product they market. Where producers engage in quality assurance programs that require pain relief, specific financial benefits may also accrue.

Registered products available for routine animal husbandry use

There are currently three products on the market that have pain relief claims for both cattle and sheep, and an additional product available for sheep. For cattle, there are also a number of additional injectable Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) that can be obtained from a veterinarian and are not covered in here.

The four products are:

- **NumOcaine** (Mavlab, sheep only) – local anaesthesia, pre-op
- **Tri-Solfen** (Bayer Australia) – local anaesthesia, post-op
- **Ilium Buccalgesic OTM** (Troy Laboratories, meloxicam) – NSAID
- **Metacam 20** (Boehringer Ingelheim, meloxicam) – NSAID

NumOcaine[®] is the local anaesthetic lignocaine marketed together with the Numnuts ring application system. At present, it is only registered for use in sheep. Some trial work with cattle is currently under way, but requires calves to be constrained in a cradle and is not considered suitable for use in a standing castration system. The NumNuts device is purchased separately to the NumOcaine, which has to be ordered through a veterinarian. The NumOcaine contains the lignocaine in a sealed system that only allows access through the NumNuts applicator, and is applied at the same time as the ring. Applicators cost approximately \$400 and NumOcaine is approximately 67c/dose. NumOcaine is an S4 (prescription only) so has to be purchased from a veterinarian. Each 100ml bottle gives approximately 65 doses.

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 is applied to wounds, so it 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).

Trisolfen dosages and costs by procedure: lambs

Weight kg	Mulesing		Tail docking		Castration	
	Dose ml	Cost \$	Dose ml	Cost \$	Dose ml	Cost \$
<=10	6	0.86	1.5	0.21	3	0.43
15	8	1.15	2	0.29	4.5	0.64
20	10	1.43	2	0.29	4.5	
>20	12	1.72	2	0.29	4.5	

Trisolfen dosages and costs: 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/10kg for lambs and 40c/20kg for calves. It is an S4 drug so it has to be purchased from a veterinarian.

Metacam 20[®] is a meloxicam (NSAID) injection (subcutaneous, under the skin at a rate of 1ml/20kg). It is available in 100ml bottles costing approximately \$150–200, or 75c/10kg for lambs and 75c/20kg for calves. It is an S4 drug so it has to be purchased from a veterinarian.

Buccalgesic 10mg/ml meloxicam dosages and costs

Sheep (1ml/10kg)			Cattle (0.5ml/10kg)		
Weight kg	Dose ml	Cost \$	Weight kg	Dose ml	Cost \$
<10	1	0.40	30	1.5	0.60
15	1.5	0.60	40	2.0	0.80
20	2.0	0.80	50	2.5	1.00
25	2.5	1.00	60	3.0	1.20
30	3.0	1.20	70	3.5	1.40

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 price is likely to vary depending on client relationship and volume.



The Australian Animal Welfare Standards and Guidelines 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 sheep/cattle welfare.”

For sheep producers, the Australian Animal Welfare Standards and Guidelines for Sheep provides the following guidelines:

- “G6.14 Tail docking and castration should be accompanied by pain relief when practical and cost-effective methods become available. Operators should seek advice on current pain minimisation strategies.”
- “G7.8 Mulesing should be accompanied by pain relief where practical and cost-effective methods are available. Operators should seek advice on current pain minimisation strategies.”

For beef producers, the Australian Animal Welfare Standards and Guidelines for Cattle states:

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

Anaesthesia versus analgesia

Anaesthesia refers to loss of physical sensation with or without loss of consciousness. Effective anaesthesia aims to eliminate pain in that part of the body anaesthetised by numbing it. However, pain may be experienced once the anaesthesia wears off. **Analgesia** refers to pain relief without total loss of feeling or consciousness.

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.

Local anaesthetics versus NSAIDs

In general, **local anaesthetics** deal with immediate pain, making the animal more comfortable while the procedure occurs and shortly after. Local anaesthetics are generally 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 it will only provide any level of analgesia for less than one hour. Tri-Solfen contains two local anaesthetics being lignocaine and bupivacaine, which are longer acting, and so provides longer analgesia (e.g. 2–4 hours, possibly up to six hours) when applied to a wound.

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 injections) for years, but have only recently been registered in sheep (Metacam, Buccalgesic). NSAIDs take 15–30 minutes to take effect, and generally provide pain relief for at least nine hours, but often longer. For example, Colditz et al (2019) reported meloxicam’s maximal effect 6–9 hours’ post treatment. Small et al (2014) reported a seven-fold

decrease in adverse animal behaviours seven hours after surgical castration and hot iron tail docking with post treatment of buccal meloxicam, and only a small effect at 24 hours.

Despite being anti-inflammatory, Colditz et al (2019) reported no effect of meloxicam on inflammation and appetite in sheep, and Small et al (2014) found no improvement in movement of treated lambs or any production gain.

- “Although local anaesthesia does provide amelioration of the acute pain response to painful husbandry procedures, the pharmacodynamic duration of action is short-lived... it appears that durations of greater than 3–4 hours are not currently achievable.”
- “Use of local anaesthesia with NSAIDs for livestock undergoing routine husbandry procedures provides greater amelioration of the pain response than use of a single agent alone [133, 134, 212], and should be recommended as current best practice.”

Gap Evaluation of Pain Alleviation Research

Alison Small, Andrew Fisher, Caroline Lee and Ian Colditz, AWI Final report, ON-00550, June 2020

Take home messages

1. The provision of pain relief with routine husbandry practices is now an expectation.
2. Products available include local anaesthetics and NSAIDs.
3. 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.

References

Colditz, I, Paull, D, Lloyd, J, Johnstone, L and Small, A (2019). Efficacy of meloxicam in a pain model in sheep. *Aust Vet J*;97:23-32.

Small, A, Belson, S, Holm, M and Colditz, I (2014). Efficacy of a buccal meloxicam formulation for pain relief in Merino lambs undergoing knife castration and tail docking in a randomised field trial. *Aust Vet J*;92: 382-388



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