

CALF DISBUDDING PROTOCOLS

Changes to the Ministry for Primary Industries (MPI) Animal Welfare Regulations¹ mean that from 1 October 2019 all animals being disbudded must be given local anaesthetic.

Best practice recommends a combination of local anaesthetic and systemic non-steroidal anti-inflammatory drug (NSAID) should be given to provide the best management of pain associated with disbudding. The New Zealand Veterinary Association (NZVA) disbudding and dehorning of cattle policy² also recommends addition of sedation to be considered.

This policy document lists the following guidelines for disbudding:

1. All cattle with horn tissue should have this tissue removed as early as practical, to minimise the pain and distress during removal.
2. Disbudding and dehorning must only be performed after effective anaesthesia of the horn tissue.
3. As well as local anaesthesia, use of appropriate long-acting analgesia should be considered at the time of disbudding and dehorning.
4. Sedation of animals prior to disbudding and dehorning should be considered as a means to further reduce pain and distress associated with the procedure.
5. Disbudding should be carried out between two and six weeks of age.
6. Disbudding using a cautery iron is the recommended method.
7. Caustic paste is not recommended for disbudding in calves due to the possible chemical burning of skin and eyes. Calves can also lick the paste off each other causing chemical burns to the mouth.
8. Scoop dehorning is also not recommended as it has been demonstrated to be more painful than the use of a cautery iron.
9. All animals should be observed for a period of two weeks after disbudding or dehorning to detect complications following the procedure.

The “gold standard” veterinary protocol for calf disbudding includes the use of a NSAID in conjunction with sedation and local anaesthetic. This provides analgesia for the period after the effect of local anaesthetic has ‘worn off’. Studies^{4,5,6,7,8} have shown that calves disbudded without local anaesthesia showed behavioural signs of pain (tail shaking, ear flicking, head shaking), reduced ‘normal’ behaviours (lying, feeding, ruminating) and increased plasma cortisol within an hour or two after the disbudding procedure.

Calf Disbudding Study³

Study Objective

To assess whether analgesia at disbudding had an effect on calf weight gains during the following month.

Study Design

The Study enrolled dairy calves, three to six weeks old from commercial farms, grown in two calf-rearing operations. Calves were weighed prior to disbudding and again 15 and 30 days after disbudding. On each farm calves were randomly assigned to treatment groups as shown in Table 1.

DISBUDDING METHOD	TREATMENT GROUPS	n
Vet	Xylazine (IM) + Lignocaine (SQ, over the horn bud)	30
Vet + Mel	Xylazine (IM) + Lignocaine (SQ, over the horn bud) + meloxicam (20mg SQ)	30
Non-vet	No analgesia	31
Non-vet + Mel	Meloxicam (20mg SQ)	30

Table 1. Treatment Groups

All calves were not given a milk feed for 12 hours prior to disbudding. Study calves still had access to calf meal, hay and water.

Calves were disbudded using heat cautery of the horn bud. All calves were disbudded on the same day, by the same team of veterinarians and technicians. Where meloxicam was administered, this was given immediately prior to disbudding.

Results

The weight gains from disbudding to day 15 are shown in Figure 1. Providing no analgesia (non-vet) resulted in significantly reduced growth rates in calves compared with calves given analgesia at disbudding (all other groups). Meloxicam did not increase the growth rate of calves receiving sedation and local anaesthesia, but meloxicam alone did significantly increase the growth rate of calves over the first 15 days compared to disbudding without any analgesia.

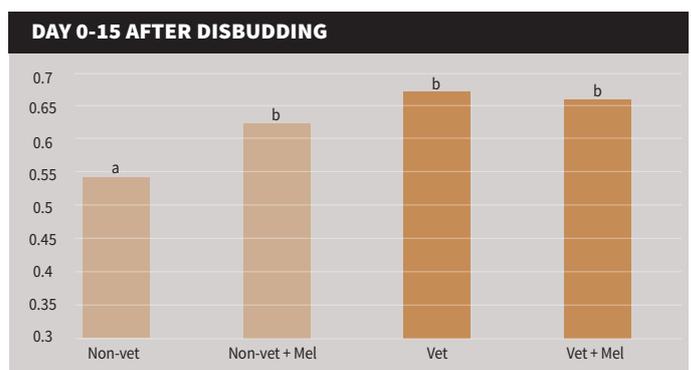


Figure 1. Mean daily weight gain (kg/day) during the first 15 days following disbudding of 270 young calves. Data points with different letters are significantly different ($p < 0.05$)

Overall weight gains are shown in Table 2. Growth rates between days 16 and 30 tended to be lower in calves disbudded without any form of analgesia than calves receiving sedation and local anaesthetic and calves receiving only meloxicam. Adding meloxicam to sedation and local anaesthetic did not further increase growth rates over this period. This meant that calves receiving sedation and local anaesthetic grew significantly faster for the 30 day period following disbudding, whilst calves receiving no sedation or local anaesthetic that also received meloxicam grew faster for the first 15 days only.

DISBUDDING METHOD	TREATMENT GROUPS	n	DAILY GAIN (DAYS 0 -15)	DAILY GAIN (DAYS 0 -30)
Vet	Xylazine + Lignocaine nerve block	30	0.67 (0.66-0.68) ^b	0.70 (0.69-0.71)
Vet + Mel	Xylazine + Lignocaine nerve block + meloxicam	30	0.66 (0.65-0.68) ^b	0.70 (0.69-0.71)
Non-vet	No analgesia	31	0.54 (0.53-0.56) ^a	0.57 (0.56-0.58)
Non-vet + Mel	Meloxicam	30	0.62 (0.61-0.63) ^b	0.65 (0.64-0.66)

Table 2. Mean daily weight gain (kg/day) for all groups (p<0.05)

Liveweight gain during the 30 days following disbudding is shown in Figure 2. Use of analgesia resulted in 3 - 4 kg additional bodyweight over this period.

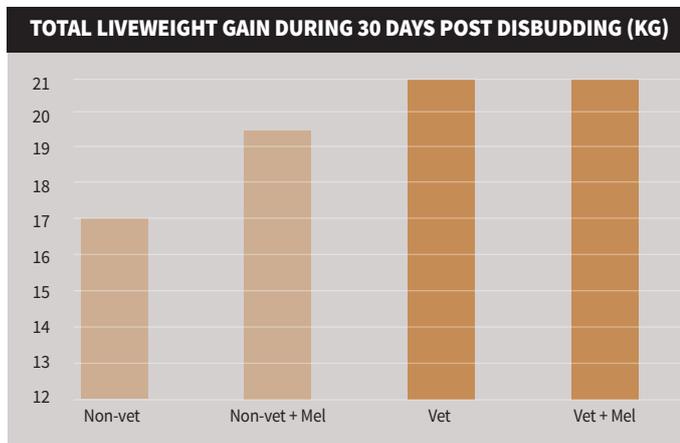


Figure 2. Total average liveweight gain over the 30 days following disbudding of young calves

Discussion

The Study results show that providing no analgesia at the time of disbudding significantly reduces bodyweight gains in young calves. There is significant evidence that analgesia at disbudding both reduces the pain and inflammation caused by the procedure, and also has a positive impact on farm productivity through calf growth rates.

Adding meloxicam to a Vet program using xylazine and lignocaine provided no additional weight gain benefit in this Study. It is hypothesised that giving the meloxicam 15 minutes prior to

disbudding may have a larger effect, as this delay would have provided enhanced analgesia for the procedure as well as reducing post-disbudding inflammation.

Conclusion

Providing calves with meloxicam at the time of disbudding, (where no local anaesthesia is used) mitigates some of the negative impacts of the procedure. This has a positive impact on calf welfare as well as farm productivity, providing 3 - 4 kg additional liveweight gain during the following 30 days. This may result in calves reaching weaning weight and other growth targets earlier.

Local anaesthesia with sedation and administration of meloxicam remains the gold standard recommended disbudding procedure as the combination reduces behavioural and physiological effects associated with pain following disbudding ^{3,4,5,6,7,8,9}.

References

¹<https://www.mpi.govt.nz/protection-and-response/animal-welfare/guide-to-the-animal-welfare-care-and-procedures-regulations/>

²New Zealand Veterinary Association 2019. Disbudding and dehorning of cattle policy. <https://www.nzva.org.nz/general/custom.asp?page=policydehorning>

³Bates, A, Laven, R, Chapple, F & Weeks, D. 2016. The effect of different combinations of local anaesthesia, sedative and non-steroidal anti-inflammatory drugs on daily growth rates of dairy calves after disbudding. NZ Veterinary Journal, 64:5, 282-287.

⁴McMeekan, C, Stafford, K, Mellor, D, Bruce, R, Ward, R & Gregory, N. 1999. Effects of a local anaesthetic and a non-steroidal anti-inflammatory analgesic on the behavioural responses of calves. NZ Veterinary Journal, 47:3, 92-96.

⁵Stafford, K, Mellor, D, Todd, S, Ward, R & McMeekan, C. 2003. The effect of different combinations of lignocaine, ketoprofen, xylazine and tolazoline on the acute cortisol response to dehorning in calves. NZ Veterinary Journal, 51:5, 219-226.

⁶Milligan, B, Duffield, T & Lissemore, K. 2004. The utility of ketoprofen for alleviating pain following dehorning in young dairy calves. Canadian Veterinary Journal, v45, 140 - 143.

⁷Duffield, T, Heinrich, A, Millman, S, DeHaan, A, James, S & Lissemore, K. 2010. Reduction in pain response by combined use of local lidocaine anaesthesia and systemic ketoprofen in dairy calves dehorned by heat cauterisation. Canadian Veterinary Journal, v51, 283 - 288.

⁸Stock ML, Baldrige SL, Griffin D, Coetzee JF. 2013. Bovine dehorning assessing pain and providing analgesic management. Veterinary Clinics of North America: Food Animal Practice 29, 103-33

⁹Bates, A, Eder, P, Laven, R. 2015. Effect of analgesia and anti-inflammatory treatment on weight gain and milk intake of dairy calves after disbudding. NZ Veterinary Journal, 63:3, 153-157.

Melovem³⁰

Administer by intravenous or subcutaneous injection

Dose for cattle: 1mL per 60kg (8mL per 480kg cow) as a single treatment

Withholding Periods for cattle: Milk 84 hours

Meat 10 days

Melovem is a longer action NSAID. It is registered for use in calf disbudding procedures at a dose of 0.3mL per 20kg.

Melovem 30 is a restricted veterinary medicine, registered pursuant to the ACVM Act 1997, No A11562