Dehorning of cattle and disbudding of calves

Policy
The NZVA considers that dehorning and disbudding of cattle are necessary farm practices, but, as painful procedures, require the use of appropriate analgesia.

Explanation
Horned cattle, particularly when confined during mustering, yarding and transport, are capable of causing severe injury to other cattle and to handlers, including significant hide damage. There are also limitations on the transport of horned animals, so natural or artificial polling is therefore desirable.

While, under the Animal Welfare (Painful Husbandry Procedures) Code, analgesia must be used when dehorning cattle over 9 months, use of analgesia is a recommendation rather than a minimum standard for disbudding and dehorning of cattle under 9 months.

The NZVA believes that pain, tissue damage and distress caused by such procedures necessitate the use of pain relief and that a combination of local anaesthetic with a systemic non-steroidal anti-inflammatory drug has been shown to provide the best result. The use of products with label claims for disbudding and dehorning is recommended.

Disbudding of calves is preferable to dehorning older cattle. There is less short-term distress if calves are disbudded with a cautery iron.

Guidelines
1. Disbudding and dehorning should only be performed after effective “blocking” of the cornual nerve with local anaesthetic.
2. Disbudding should be carried out between one and six weeks of age.
3. Disbudding using the cautery iron is the recommended method. 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. Scoop dehorning is also not recommended as it has been demonstrated to be more painful than the use of the cautery iron.
4. All calves should be observed for a period of two weeks after disbudding to detect infections following the procedure.
5. As well as local anaesthesia, appropriate long-acting analgesia should be given at the time of disbudding and dehorning.
References


Sylvester SP, Stafford KJ, Mellor DJ, Brice RA, Ward RN. Behavioural responses of calves to amputation dehorning with and without local anaesthesia. Australian Veterinary Journal 82, 697-700, 2004
Standard operating procedure for the process of humane disbudding of calves

A standard operating procedure for veterinarians.

**Purpose of this standard operating procedure**
- To provide specifications for the process of humane disbudding of calves.
- To describe standard procedures for veterinarians to follow to ensure a high quality, consistently delivered, humane calf disbudding service.
- Veterinarians have a professional and ethical obligation to perform to a standard of excellence.

**Preparation of this standard operating procedure**
The material for this Standard Operating Procedure has been collated by members of the Society of Dairy Cattle Veterinarians (DCV) of the New Zealand Veterinary Association. It is reviewed and updated as new trial work or legislation comes to light by the DCV executive committee.

**Disclaimer**
Whilst the New Zealand Veterinary Association (NZVA) has made every effort in conjunction with other organisations to:

a) prepare and incorporate the most up-to-date and effective technical specifications in this standard operating procedure (SOP) for veterinarians; and

b) prepare and incorporate the most up-to-date and effective procedures for veterinarians to use in the process of humane disbudding of calves;

It shall not be liable to any veterinarian or to any other person or entity whatsoever for or in relation to any claim, action or proceeding whatsoever (whether in contract, negligence or other tort or in proceedings seeking any other form of legal or equitable remedy or relief) for any inadequacy error or mistake or for any deficiency in the whole or any part of the technical specifications or procedures contained in this Standard Operating Procedure (SOP) and the veterinarian or any other person or entity acting upon the contents of this SOP acknowledges and accepts that this is the basis upon which the NZVA has produced this SOP and made it available to such person or entity.

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Standard operating procedure for veterinarians for the process of humane disbudding of calves

Background
It is widely accepted that horned cattle pose a considerable risk to their herd mates and potentially to herd owner/managers. The gene pool for polled cattle appears to be fairly small so that in most herds some form of disbudding or dehorning is practiced.

The Animal Welfare (Painful Husbandry Procedures) Code of Welfare 2005 sets standards for the performance of husbandry procedures including disbudding. Minimum Standard 5(b) requires that, when disbudding is being performed, “the method must be chosen and undertaken so as to minimise the pain and distress and other negative health consequences”, and recommends as best practice the provision of pain relief. There are clear indications in the literature regarding disbudding of calves that the use of local anaesthesia and/or systemic analgesia reduces the amount of pain/stress experienced by the calves (see references). Furthermore, the use of the cautery technique is considered to be superior to the use of the scoop technique in terms of pain/stress experienced by the calves (see references).

The NZVA believes that the animal welfare of calves is best served if the disbudding procedure, whether carried out by veterinarians or by veterinary technicians under the supervision of veterinarians, is carried out using analgesia.

From 1 October 2019 the use of pain relief will be mandatory in New Zealand when disbudding or dehorning cattle of any age according to legislation from the Ministry for Primary Industries.

Aim of the procedure
The aim of the procedure described is to disbud young calves safely and with a minimum of pain and distress to them, while making it effective and efficient for the operator.

3. Operating procedure for calf disbudding

3.1 Pre-disbudding considerations:
(i) The preferred age at disbudding is between two and six weeks of age. Small horn-buds are easier to remove completely, leaving only a small wound; larger buds may require more than one attempt. Also, the amount of sedative used can be less compared to older animals, with a more predictable response.

(ii) Calves exposed to rain within 48 hours of disbudding are much more likely to develop wound infections than dry calves. If rain is predicted, disbudding should either be delayed or calves should be housed in suitable conditions (i.e. dry and clean) during and for the first 48 hours following disbudding.

(iii) Feeding milk to calves within 3-4 hours, either side of sedation, but especially prior to sedation, can lead to stasis of milk in the gastro-intestinal tract with subsequent development of tympany. The veterinarian must make the owner/ manager aware of this and make sure that on the day of disbudding the calves have not been fed within 3 hours prior to the procedure.
(iv) When veterinarians use sedation as part of the disbudding procedure, herd owners/managers need to be informed of possible delayed hypersensitivity reactions in calves to xylazine. Details of incidence, clinical signs and prophylaxis need to be conveyed prior to use.

(v) Herd owners/managers must report to their veterinarian, any unexpected or adverse event after calves have been disbudded.

(vi) Health and safety considerations include, but are not limited to:
   a) Fire risk
      Gas-heated instruments can pose a fire risk (i.e. contacting nearby flammable materials)
   b) Electric shock
      230 volt cautery instruments, in possibly damp conditions, and using extension cords can pose dangers to operators and animals. A current-breaking device installed in the circuit at point of power draw-off is recommended.
   c) Burns
      Some disbudding equipment is hot and can cause burns to humans and animals. Due care is required.
   d) Toxins associated with smoke (carcinogens)
   e) Repetitive strain injuries
   f) Injury from other equipment and/or animals
   g) Needle stick injury

3.2 Restraint:

3.2.1 Sedation:
   (i) Sedation of calves is obtained by injecting xylazine 2%, intra-muscularly into the anterior half of the neck, at a dose rate of 0.1-0.2 ml per 10 kg body weight (BW). It is convenient to set up some sort of automatic syringe for this purpose. The needle size used is 18G x 3/8". While the lower rate of xylazine will result in calves recovering from sedation faster after disbudding, more calves will try to stand during the disbudding process. The higher xylazine rate ensures all calves stay recumbent but recovery is slower. The use of a xylazine antagonist agent (such as Tolazine) is recommended should it be deemed necessary by the attending veterinarian that the level of sedation is excessive or life threatening.
   (ii) As each calf is injected, it is marked with a raddle spray in order to avoid double dosing. Calves will become recumbent 2-3 minutes after receiving their injection.
   (iii) Calves will remain recumbent for approximately 60 minutes. Sedate no more than 40-50 calves per operator at one time, as this is approximately the number of calves that can be disbudded in one hour.
   (iv) There is potential, as in any situation with multiple use of injection needles, for transfer of diseases like EBL from one calf to another. A fresh needle for each farm and a fresh needle for every 40-50 animals per farm is a minimum standard.
   (v) Ensure that all recumbent calves are on their sternums during the disbudding process.

3.2.2 Yard restraint:
Restraint can be satisfactorily gained through the use of appropriate cattle yards/races or head crushes for the administration of disbudding drugs. This process has a number of advantages but in the absence of satisfactory facilities, sedation must be used.
3.3 Local anaesthesia:

(i) Once the calves are restrained, analgesia is obtained by injection of local anaesthetic (2% lignocaine hydrochloride, with or without adrenalin). A combination of local nerve block and local infiltration gives a superior effect to that of local nerve block alone.

(ii) The nerve block is affected by injecting 2-3 ml of local anaesthetic at the midpoint between the lateral corner of the eye and the horn-bud, just ventral of the facial crest, at a depth of about 1 cm (Figure 1, Block 1). Failure to achieve a successful block is often a result of injecting too deeply.

(iii) Additionally, the lateral base of the horn-bud may be infiltrated with local anaesthetic. 2-3 ml of local anaesthetic is injected subcutaneously, at the midpoint between the bud and the base of the hemi-lateral ear (Figure 1, Block 2). The needle size used for both blocks is 18G x 3/8”. A fresh needle is to be used between farms and between every 40-50 animals as a minimum. However, it is recommended to change the needle if the tip becomes burled or if the site is dirty and contaminated which will contaminate the needle.

(iv) Calves that have been injected with local anaesthetic should get another raddle mark to avoid duplicate injections. The recommended minimum amount of time between injecting the local anaesthetic and disbudding is 3-5 minutes. Any struggling by the calf during disbudding means that either not enough time was allowed between injection of local anaesthetic and disbudding, and/or improper placement of the local anaesthetic, or poor restraint technique. Allow more time and/or inject more local anaesthetic if this problem occurs. The maximum time between the injection of the local anaesthetic and disbudding is 1 hour.

Figure 1. Injection sites of local anaesthetic

3.4 Systemic analgesia:

Appropriate systemic non-steroidal should be used as additional long-term pain relief.

Veterinarians are advised to review current literature on appropriate systemic pain relief including references in this document.
3.5 **Disbudding:**

(i) Disbudding is performed by cautery. The instrument used needs to be hot and of the right size:

The quality of the instrument will determine the temperature at the tip; high wind speeds can cool it down. Some brands of instruments will not be able to generate sufficient heat to disbud many calves in fast succession; two cautery instruments may have to be used alternatively.

The tip of the instrument needs to be kept relatively sharp and even. Prolonged use will erode the edge to a blunt and ragged shape. Tips can be filed back into shape a few times after which they need to be replaced.

A head of 16 mm or 18mm cross section at the tip are the best sizes for most calves (smaller diameter for smaller calves). The crater-shaped inside of the tip tends to clog up with burnt skin. This needs to be removed periodically or the effective depth of the tip will be reduced, making disbudding slower and more difficult.

Clipping the horn bud area is an option to reduce smoke and fire risk as well as assist in visualizing the horn bud area. A face mask is recommended to reduce smoke inhalation.

(ii) The tip is placed over the horn-bud and pushed downwards. With a hot, sharp tip and enough pressure, the cut should be completed in approximately 5-6 seconds. The tip should "fall" through the skin, with a characteristic "popping" sensation occurring when the skin is fully cut through. If the cut takes longer to make, the tip is either cold or blunt, or not enough pressure is exercised. If the cut takes less time to complete, more haemorrhaging will occur because blood vessels will not be cauterised sufficiently.

(iii) It is extremely important to keep the tip at more or less right angles to the skin of the calf's head. Positioning the tip too flat will result in too much heat transferred into adjacent skin with subsequent necrosis and possible abscess formation. Scooping the bud out after cautery is not technically necessary as horn growth occurs from the ring of germinative tissue around the base of the bud, not the centre. It is however a good check on the completeness of the skin cut and therefore recommended.

(iv) Either electric or gas-heated instruments can be used. Electric tools have the advantages of creating less smoke and fumes. Gas-fired cautery instruments also carry a danger of burning calves and operators with the flames ejected at the side of the instrument.

(v) After disbudding, wounds should be sprayed with an appropriate antiseptic.

3.6 **Other procedures:**

With the calves recumbent, there is opportunity to perform other minor procedures. Removal of supernumerary teats, checks on navels, placing of ear tags, DNA testing, BVD vaccination, and Clostridial vaccination are examples.

3.7 **Final check:**

Before leaving the property, a number of checks need to be made:

(i) Ensure recumbent calves are on their sternums. This reduces the chance of development of ruminal or gastric bloat and aspiration pneumonia.

(ii) Check all cautery wounds for bleeding. Any bleeding wounds must be re-cauterised to stop bleeding completely.

(iii) The owner/manager needs to be made aware that the recumbent calves must not lie on their sides and at all times must maintain sternal recumbency. Recovery from sedation should take approximately one hour after injection with xylazine. Milk should not be fed within three hours of recovery.

(iv) Consideration needs to be given to calves that are recumbent without shade and in direct
sunlight. Ensure that hyperthermia does not occur.

(v) Veterinarians may consider the use of a xylazine antagonist (e.g. Tolazine-100mg/ml injection at a rate of 2-4mg/kg or check the label recommendation) in the situation where the level of sedation is excessive or life threatening.

4. **References**


