



DISBUDDING OF DAIRY CALVES

1. DISBUDDING

Is the term that is used when the horn bud is removed before the horn attaches to the underlying skull bone.

2. DEHORNING

Is the term used when the horn bud has attached to the skull and the bone started to grow into the horn.

3. HORN DEVELOPMENT

For the first 8 weeks the horn buds are not attached to the skull but are free floating within the skin. At that stage the only nerve supply to the horn bud is the corneal nerve. The site of horn production is by cells within the corium located at the junction of the horn and skin. If the bud is removed but the corium is not, horn growth will continue to take place. From approximately 6 to 8 weeks of age onwards, the horn bud attaches to the underlying frontal bone of the skull and starts to grow. The frontal sinus of the skull starts to grow into the horn from approximately 6 months old causing the horn to become hollow and the nerve and blood supply also starts to develop, which can cause problems and makes it very painful if dehorning is delayed to this stage. By this time, the corneal nerve also provides sensation to the skin of this region, thus the need for additional nerve blocking techniques when dehorning is done at later stages of a calf's life.

4. GUIDELINES FOR DISBUDDING

- 4.1. The **SABS SANS 1694 – WELFARE OF DAIRY CATTLE par. 8.6.1** stipulates - *“Disbudding of a calf after 2 months of age is prohibited unless an appropriate analgesia and sedation is applied under supervision of a veterinarian and competent person”*. In other words, disbudding without painkillers or anaesthetic is only allowed up to 8 weeks old.
- 4.2. The ideal age for disbudding is 2 to 6 weeks of age.
- 4.3. It should only be done by properly trained personnel.
- 4.4. This is a 2-person job. The calf needs to be properly restrained to protect the calf as well as the handler.
- 4.5. It is advisable to administer a sedative to prevent the calf from struggling and injury to the handler and calf. Sedatives are scheduled drugs and by law may only be administered under direct supervision of a veterinarian. (see par. 5.3)
- 4.6. It is advisable to give a local anaesthetic to numb the pain during the procedure. Local anaesthetics are schedule 4 drugs in South Africa and may only be administered by a veterinarian. (see par. 5.4)
- 4.7. It is advisable to give the calf an analgesic (painkiller) at the time of disbudding. (see par. 5.5). At the very least, give the calf an analgesic (painkiller), even if you are not using sedatives and local anaesthetic during disbudding,
- 4.8. Do not perform other painful procedures (such as castration) at the same time as disbudding. Research has shown that the pain reaction is additive, meaning that the procedures are more painful if performed together than if they are performed separately. At least 2 weeks apart is preferred.



5. PAIN MITIGATION

- 5.1. Disbudding is a painful procedure regardless of the method employed. Pain response in disbudded calves is exhibited by head shaking, head rubbing, bellowing, foot-stomping, self-grooming, reduced feed intake, reduced rumination, reduced playing and reduced lying down. Behavioural monitoring of calves has shown disbudding to be markedly uncomfortable in the hours and days after the procedure. The economic impact of the associated reduced feed intake and hence growth rate is well documented. The use of non-steroidal anti-inflammatory drugs (painkillers) helps to reduce the pain associated with disbudding.
- 5.2. The method of choice is to sedate the calf, give a corneal nerve block with a local anaesthetic to numb the pain during disbudding and give the calf an analgesic for the pain they may experience afterwards. However, regulatory access to sedatives and anaesthetics, as well as costs, remain obstacles to practical application.
- 5.3. **Sedatives** - It is advised that calves are sedated before disbudding. It makes the procedure less stressful for the calf, makes handling the calves a lot easier and helps to prevent injury to the calf and handler. There are various sedatives available. Unfortunately, they are scheduled drugs that, by law, may only be administered under the direct supervision of a veterinarian.
- 5.4. **Local anaesthetic** numbs all feeling by preventing the nerve from transmitting pain signals.
- 5.4.1. The effect lasts for 1,5 to 2 hrs after administration.
- 5.4.2. Lignocaine (or Lidocaine) may also reduce long term pain due to some anti-inflammatory action.
- 5.4.3. A local anaesthetic is administered approximately 5-20 minutes before disbudding by injecting 2-4ml of Lignocaine around the corneal nerve. The corneal nerve is located between the outside corner of the eye and the base of the horn bud just below the bony ridge formed by the frontal bone. Palpate the ridge between the eye and the horn bud. Slide a 20-22 gauge, ½" needle below the ridge at the midpoint between the eye and the horn bud, injecting 2% lignocaine subcutaneously (see fig 1).

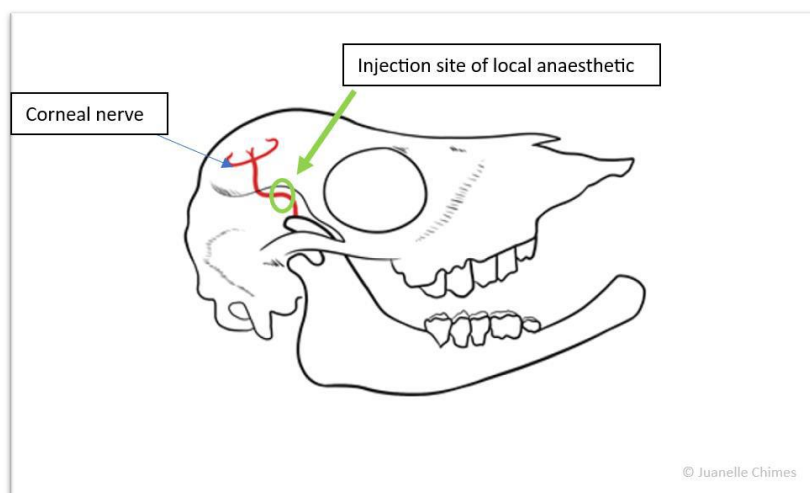


Fig. 1 – Position of the corneal nerve and nerve block in a calf.

- 5.4.4. Test that there is no pain sensation by pricking the skin around the horn bud with a syringe needle before disbudding.



5.5. The **analgesics** (painkillers/anti-inflammatory drugs) commonly used to prevent pain in cattle are in fact anti-inflammatory drugs that suppress the inflammatory response that leads to chemicals being released that causes a pain reaction and swelling. They generally work for 8 to 24hrs after administration. The analgesics licensed for use in cattle are Meloxicam, Ketoprofen, Carprofen and Finadyne. None are licensed for use in calves younger than 7 days old. Therefore it is recommended that hot-iron disbudding is only performed after 7 days of age.

5.5.1. Administering analgesics has several benefits. Calves given analgesic at disbudding:

5.5.1.1. Have better weight gain for the first 10 days after the procedure compared to calves that do not receive analgesics.

5.5.1.2. are less likely to develop pneumonia or diarrhoea. Pain causes stress leading to suppression of the immune system. Therefore, less pain leads to less immune suppression.

6. SOCIAL BUFFERING

Research has shown that calves kept in pairs increased their forage intake quicker than calves housed individually. This indicates that socially housed calves may react differently to the trauma of disbudding compared to individuals kept in isolation.

7. DISBUDDING TECHNIQUES

7.1. Heat cauterisation

7.1.1. **SANS 1694 THE WELFARE OF DAIRY CATTLE par 8.6.1** stipulates that *“Calves 2 months or younger, may be disbudded using hot iron cauterisation by a competent person.”*

7.1.2. It is the most common method used. It is also the method that has the lowest failure rate with the least likelihood of horn or spurs regrowing later in life if performed by a competent person.

7.1.3. Give a sedative for safety of operator and calf.

7.1.4. Perform a corneal nerve block by administering 2ml local anaesthetic to numb the pain.

7.1.5. Give analgesics at the time of dehorning. The maximum pain after cauterisation of horn buds occurs approximately 90 minutes after the procedure. The most common used analgesic is Meloxicam (Petcam, Metacam, Inflacam)

7.1.6. It can be done once you can feel the buds. Ensure that the correct size of iron is used for the size of the horn bud. It is important that the corium in the skin surrounding the horn bud is also cauterized to prevent horn regrowth. Burn 20 seconds max. until there is a copper-coloured ring around the horn bud. Only apply firm light pressure - do not go too deep. Only rotate the iron clockwise and counter-clockwise - do not move the iron side to side since it may burn too deep and injure the underlying bone. Keep the ears away from the hot iron.

7.1.7. Apply antiseptic spray or ointment afterwards. In the days after the intervention, monitor the wound healing process and the general state of the animal, looking for indications of pain. Do not use antibiotic spray as a prevention after disbudding, since it increases the chances of anti-microbial resistance developing on your farm. Only use antibiotics if there is actual infection.



7.2. Caustic paste

7.2.1. Second most common used technique. Although **SANS 1694 – THE WELFARE OF DAIRY CATTLE par 8.6.1** currently stipulates: - *“Chemical cauterisation shall not be carried out since it is a painful protracted process. The paste can leak caustic chemicals from the site of application, damaging the skin and eyes of the calves, the udders of mother cows and even the skin of other calves.”* (The standards are due for revision where Milk SA will argue for allowing the use of caustic paste).

7.2.2. Although less intense than hot iron cauterisation, the pain sensation does last longer when using caustic paste. Reaches max pain at 90 mins after application.

7.2.3. Give local anaesthetic and analgesia. Sedation is not required.

7.2.4. Do not use if the calves are kept outside and there is a chance of rain within the next 24 hours.

7.2.5. Wear gloves when applying. Cover horn bud with duct tape after applying to prevent the calf from rubbing it off on other calves or the cow's udder. Perform within the first 2 weeks of age. The sooner the better because very young calves are less likely to rub it off.

7.3. Clove oil (Eugenol)

7.3.1. Injecting clove oil under the horn bud appears to cause less initial pain and tissue damage than cautery disbudding. This method is showing a lot of potential. With the current technique there is approximately a 10% or higher failure rate, which is probably due to poor restraint. Clove oil appears to have anaesthetic and anti-inflammatory properties.

7.3.2. 2ml of clove oil is injected directly in the centre under the horn bud using an 18G needle. Best approach is to direct the needle from the centre of the head towards the ear until it is under the horn bud.

7.3.3. Sedation of the calf is recommended since the failure rate of this method is related to poor restraint leading to incorrect placement of the clove oil.

7.3.4. Give the calf painkillers as well since the oil does cause inflammation which can be painful.

7.4. Cryoablation

Disbudding calves by freezing the bud with liquid nitrogen has proven to be ineffective and should not be done.

8. DEHORNING (AMPUTATION)

Only to be done by veterinarian under sedation, local anaesthetic and blood control.

9. POLLED BULLS

Selection and breeding of polled stock is increasing in popularity since it eliminates both animal pain and production expenses associated with dehorning. Polledness is a dominant autosomal trait. Using a polled bull will result in 50% polled offspring in the first year. If you use a homozygous polled bull then 100% of offspring will be polled in the first year. Obtaining semen from polled bulls with decent production traits used to be problematic, but choice of polled bulls has improved in recent years. *“The emphasis should be on selecting for reduced expenses and improved margin, not just maximum production.”*