

DEHORNING/CORNUECTOMY



BASICS

OVERVIEW

- Horns are the single major cause of carcass wastage in cattle. Dehorned cattle require less feed bunk space, are easier to move through facilities and to transport, and present less risk of injury to herd mates and the producer.
- Dehorned goats present less risk to handlers, children and herd mates, and currently in the USA, dairy goats cannot be registered or shown if they have horns.
- The germinal epithelium at the corium is the site of horn production, and horns are similarly constructed between goats and cattle.
- In young animals the horn buds are not attached to the skull, but with growth, they will attach to the periosteum of the frontal bone overlying the frontal sinus, and the cornual diverticulum of the frontal sinus will extend into the horn.
- Horn blood supply originates from the cornual artery at the ventral aspect of the horn, which branches into dorsal and ventral arteries with many smaller branches.
- The horn is supplied by the cornual branch of the lacrimal nerve which runs from the caudal orbit to the horn slightly below the temporal line. In goats the horn is also supplied by the cornual branch of the infratrochlear nerve.
- Effective removal of the horn requires removal of the entire corium. Typically removing or damaging skin $\sim \frac{1}{4}$ to $\frac{1}{2}$ inch below the hair line results in successful dehorning or disbudding.
- Partial or deformed horns in livestock are called 'scurs'. Scurs will occur if the horn but not the corium is removed, and can become problematic over time as they grow.
- Restraint (physical +/- chemical), is vital for effective and proper dehorning.
- Local anesthesia is imperative and a ring block is often necessary around the base of the horn in conjunction with a cornual nerve block for cattle.
- General anesthesia is often recommended for dehorning goats.
- Chemical caustic paste, Barnes dehorner, tube or scoop type instruments, electric or butane filled cautery irons or a combination of these options are available to perform this common livestock procedure.
- Cosmetic dehorning can be performed in animals intended for show purposes or during fly season. The difference between cosmetic and non-cosmetic dehorning is that the wound is sutured and not cauterized and left to heal by second intention.
- Dehorning of adult animals is associated with risks of sinusitis, bleeding, prolonged wound healing, and infection.
- Dehorning can be associated with welfare concerns, especially when performed on mature animals. Disbudding at a young age, or breeding hornless or "polled" animals is recommended to reduce the necessity for this procedure.

METHODS

Preparation

- The author recommends dehorning/disbudding calves less than one month old. Goat kids may be disbudded at 3-5 days (bucks), 5 to 7 days (does) or 10 to 14 days (pygmies).
- Hair should be clipped before disbudding/dehorning
- Local anesthesia can be achieved alone or in combination with sedation, anesthesia and additional analgesic drugs.
 - Calves: administer 3-5 mls of 2% lidocaine using an 18 or 20 gauge 1 inch needle on each side over the cornual nerve, located midway between the base of the horn and the lateral canthus of the eye above the zygomatic arch. Anesthesia occurs within 3 to 5 minutes.
 - Goats: the cornual branches of the lacrimal and infratrochlear nerves must be blocked. The first can be achieved by placing a 22 or 25 gauge needle halfway between the lateral canthus of the eye and the lateral base of the horn, and the latter by placing a 22 to 25 gauge needle parallel to the orbit halfway between the medial canthus of the eye and the medial base of the horn. Volume injected at each of the sites varies with the size of the goat and concentration of lidocaine used; a minimum of 0.25 ml of 2% lidocaine can be injected at each of the four sites for small kids; dilution to 1% or even 0.5% increases the volume for injection.

Chemical disbudding

- The application of caustic paste can be effective if applied correctly over the horn buds in calves less than 2 days old, housed individually and protected from a wet environment. Paste dehorning is not recommended in goat kids.
- Ideally the horn buds of calves 12-18 hours old are shaved before paste is carefully applied to the area. Vaseline can be used to protect surrounding skin.

Cautery

- Electric, butane or battery powered dehorning irons are commercially available.
- The goal is to cauterize the germinal cells on and around the horn bud.
- This procedure can be performed as soon as the horn bud is palpable in calves and goat kids.
- It can be used as a sole method or in combination with the scoop dehorning instrument in calves.
- A 3 to 5 second rule during repeated applications can help to avoid thermonecrosis of the underlying bone and brain.
- A complete “copper-colored ring” at the site is the desired outcome to indicate the skin is destroyed. Buck kids require additional coverage craniomedially at the bud site in a tear drop shape to avoid future scurs.

Surgery

- Physical methods of dehorning include the use of obstetrical wire, guillotine shears, saws, spoons, cups, tubes, or high tension rubber bands.
- A combination of Barnes-type scoop dehorner and a dehorning (cautery) iron is commonly used in yearling cattle. Barnes or tube dehorner should never be used in goats.
- A combination of the tube dehorner and the dehorning iron can be used on calves <2 months old.

- The exposed cornual artery can be clamped with mosquito hemostats and slowly pulled to aid hemostasis.
- Larger horns may require the use of Keystone (guillotine) dehorner, hand saws, electrical saws, or obstetrical wire. The use of guillotine dehorner may cause an iatrogenic fracture in the skull when removing large based horns.
- Cosmetic dehorning is recommended for animals intended for showing and during fly season. After standard aseptic surgical preparation of the site, an elliptical full thickness incision is made around the base of the horn about ¼ to ½ inch from the hairline. The horn is removed with a Barnes dehorner or obstetrical wire, paying attention to not cut the skin. Often a chisel and mallet or a pair of rongeurs can be used to remove extra bone from the skull to shape or smooth it. The skin is undermined using mayo scissors allowing its “release” leading to apposition. The surgical site is then sutured using a tension relieving pattern (e.g., Ford interlocking, cruciate, horizontal and/or vertical mattress) with a number 2 or 3 non-absorbable suture.
- Obstetrical wire is recommended in adult goat dehorning, and if possible, haired skin (without corium) should be left between the horn bases to facilitate healing. Although more troublesome, skin closure can be achieved in some goats.



MEDICATIONS

- Lidocaine toxicity can occur in small ruminants and calves. A total dose of 6 mg/kg is a conservative target and recommended for goats. If volume is needed, diluting 2% lidocaine with sterile saline to 1% is appropriate.
- The use of xylazine (0.025-0.05 mg/kg IV) or combinations of xylazine, butorphanol and ketamine can be useful in anxious or fractious patients.
- Broad-spectrum antimicrobial therapy is usually unnecessary
- Tetanus toxoid or antitoxin may be administered to cattle at the time of dehorning; antitoxin is highly recommended when dehorning goats.
- If sinusitis develops, long term broad-spectrum antibiotics and flushing of the sinuses are recommended.
- Flunixin meglumine (1.1 mg/kg IV, once) or meloxicam (1 mg/kg per os followed by 0.5 mg/kg SID for 3-5 days) can provide ongoing analgesia.
- Appropriate milk and meat withdrawal times must be followed for all compounds administered to food animals.

POSSIBLE COMPLICATIONS

- Hemorrhage can be controlled through appropriate hemostasis procedures. Although clotting powder or other substances can be applied to aid hemostasis, their use may risk contamination of the frontal sinus predisposing to infection.
- Excessive heat from a dehorning iron can cause cerebral necrosis and corresponding neurologic signs
- The risk of infection relates to how cleanly the procedure was performed and the environment where the animal is kept. Sinusitis is uncommon but can occur if the sinus cavity is left open or is contaminated during the procedure, and is a higher risk with dehorning during times of the year when flies are active. Animals should be fed from the ground to promote drainage. Bandaging is often practiced in goats until the sites are scabbed over.

- Disease transmission is possible, therefore all dehorning equipment should be properly washed and disinfected to avoid transmission of BVDV and BLV via blood contamination.



MISCELLANEOUS

SEE ALSO

- Pain Management (www.fiveminutevet.com/ruminant)
- Animal Welfare (www.fiveminutevet.com/ruminant)

ABBREVIATIONS

- BLV = bovine leukemia virus
- BVDV = bovine viral diarrhea virus

Suggested Reading

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Acknowledgment The author and Book Editors acknowledge the prior contribution of Jennifer M. Ivany Ewoldt.