

Goat Disbudding, Dehorning, Castration & Pain Relief

Dr Sandra Baxendell

PSM, BVSc (Hons), PhD, MACVSc, GCertAppSC(RurExt), GCertPSectMgt, PGDAppSc, MRurSysMan- Goat Veterinary Consultancies- goatveto

Disbudding

Unfortunately has not been possible (so far) to develop a poll goat breed. The reason is that in goats the dominant gene for pollness is associated with a recessive effect for intersex, with incomplete penetrance, making all PP females intersex (Asdell 1944, Constantinou, Louca et al. 1981, Zhan, Tian et al. 1994, Szatkowska, Zaborski et al. 2014, Zhang, Cao et al. 2019). There are some poll goats found in rangeland (feral) goat populations and these genes have been found in Boer and cashmere goats that have had infusions of rangeland goats and it is possible some of the poll genes may be different (Kijas, Ortiz et al. 2013). In addition the sex ratio of poll to poll matings showed fewer female kids were born, even when all the intersexed kids were counted as females in Saanens in Israel (Soller and Angel 1964), something that is not desired by dairy goat breeders as most male kids have minimal value. This intersex gene means most dairy goats are born with horn buds as goat breeders know only mate a poll goat to a horned/disbudded goat to prevent any possibility of having an intersex kid.

Disbudding is therefore often considered essential for goats destined to be crowded into milking parlours twice a day or who will be children's pets. Eye (Bansal, Tibrewal et al. 2025) and teeth damage have been reported from goat horns (pers comm). Almost all dairy and miniature breed goats that are shown are disbudded. Goat kids with horns frequently get caught in ring-lock fencing and then can die of thirst or a dog attack.

In the United Kingdom, disbudding must be performed by a veterinarian under anaesthesia and a survey by the British Goat Veterinary Society found that vets were also giving pain relief. In New Zealand, a goat kid can only be disbudded if given appropriate pain relief authorised by a veterinarian for that purpose (Animal Welfare (Care and Procedures) Regulations 2018). In Australia there is no requirement for either anaesthesia or pain relief for disbudding, castration or dehorning but the person doing so must have relevant knowledge, experience and skills or be under the direct supervision of someone with them (AHA 2020). The Australian Veterinary Association (AVA) has had a disbudding policy since 2022 and this is publicly available on their website (<https://www.ava.com.au/policy-advocacy/policies/sheep-and-goat-health-and-welfare/disbudding-of-goat-kids/>) and states that disbudding should be performed by "an appropriately skilled veterinarian using heavy sedation/anaesthesia and analgesia" but recognises that some lay goat owners do disbud their goats, especially where no suitably trained veterinarians are available.

This AVA policy also states that thermal disbudding is the only method that can be used. Clove oil disbudding was being promoted in some USA goat groups on-line but has many severe complications (Still Brooks, Hempstead et al. 2021). This same research showed that caustic paste and liquid nitrogen freezing were very ineffective and other research found both these methods to be more painful than thermal disbudding (Hempstead, Waas et al. 2018).

The British Goat Veterinary Society produced a DVD for veterinarians to help them gain skills in disbudding and are planning to hold a series of workshops for vets using cadaver kids collected and frozen for training veterinarians across the UK in 2025. While no such training is available in

Australia, the author has a series of freely available YouTube videos on kid disbudding that vets can watch viz:

- <https://www.youtube.com/watch?v=6mT5tWD9qPE&t=247s>
- <https://www.youtube.com/watch?v=MrkQ08AX5nk&t=15s>
- <https://www.youtube.com/watch?v=qeGogPtN0D4&t=22s>

Some key points for a successful disbudding of goats kids are :

- Ensure that kids being disbudded are actually horned and not polled, by examining the hair of the kid's head for 1 (poll) or 2 (horned) swirls. This is critical because if a kid is disbudded by accident and registered as disbudded, it may be mated to a poll goat when an adult and intersex kids may then be produced.
- Disbud kids as soon as the horn bud can be felt enough to centre the hot iron. This can be around 3-5 days in males and 5-7 days in females. The AVA policy states thermal disbudding should be done within the first 2 weeks.
- It is best to remove the central bud as well as burn a circle around it (Hempstead, Waas et al. 2018).
- Male kids, especially if of the Pygmy or Nigerian Dwarf breeds, may need a figure of 8 burn as there is horn growing tissue antero-medial to the circular horn bud. These should be palpated and marked with a pen on the kid's shaved head.
- Disbudding irons can be hand-made or vets can use commercial irons for calves.
- The disbudding irons must be red hot and applied for a few seconds then the colour of the burn checked. Reapplication will most likely be needed but keep checking until an orange colour is noted.
- There are a range of sedation and anaesthetic options. Veterinarians should use the anaesthesia method with which they are most familiar e.g. masking with isoflurane gaseous anaesthesia (Hempstead, Waas et al. 2018, Hempstead, Waas et al. 2020) or slow intravenous injection of alphaxalone (4.5mg/kg) to effect. With the former the oxygen must be turned off and the kid flipped around before the hot iron is applied. Some intramuscular anaesthetics such as xylazine, do not provide anaesthesia, only deep sedation and the kids will vocalize and move when the hot iron is applied. There is one report of dexmedetomidine hydrochloride (0.5 mg/mL) injected into the muscle, that was successful when combined with lignocaine blocks and meloxicam, in preventing vocalizations or reducing vocalisation and signs of pain (Nfon, Chan et al. 2016). Ketamine given intramuscularly either alone or with meloxicam. was found to be "unsafe, unpractical and not cost effective" (Santos 2018). One conference paper reported on the use of a ketamine/xylazine/butorphanol combination (ketamine, xylazine and butorphanol (KXB) at 8.9, 0.04 and 0.09 mg/kg respectively) and found that when anaesthetising kids for hot-iron disbudding the 3 anaesthetics method was best if given by IM injection but if using IV injection, it offers no advantage over the ketamine and xylazine combination (Crilly 2022). One research group developed a technique of using meloxicam, diluted xylazine and buffered and diluted lidocaine for disbudding kids, although the kids woke up and vocalized when the hot iron was applied (Knauer, Barrell et al. 2023). Two well respected UK veterinarians, (Matthews and Dustan 2019) recommended making up a "KXB" mixture by adding 1 ml of 2% xylazine and 1ml of butorphanol to a 10 ml bottle of ketamine (100 mg/ml) and administering 0.1ml per 5kg intravenously to kids for disbudding.
- Most researchers have found that local blocks or ring blocks don't work well and can be the same or worse than no treatment (Alvarez, Nava et al. 2009, Alvarez, De Luna et al. 2015, Nfon, Chan et al. 2016, Hempstead, Lindquist et al. 2019, Hempstead, Lindquist et al. 2020,

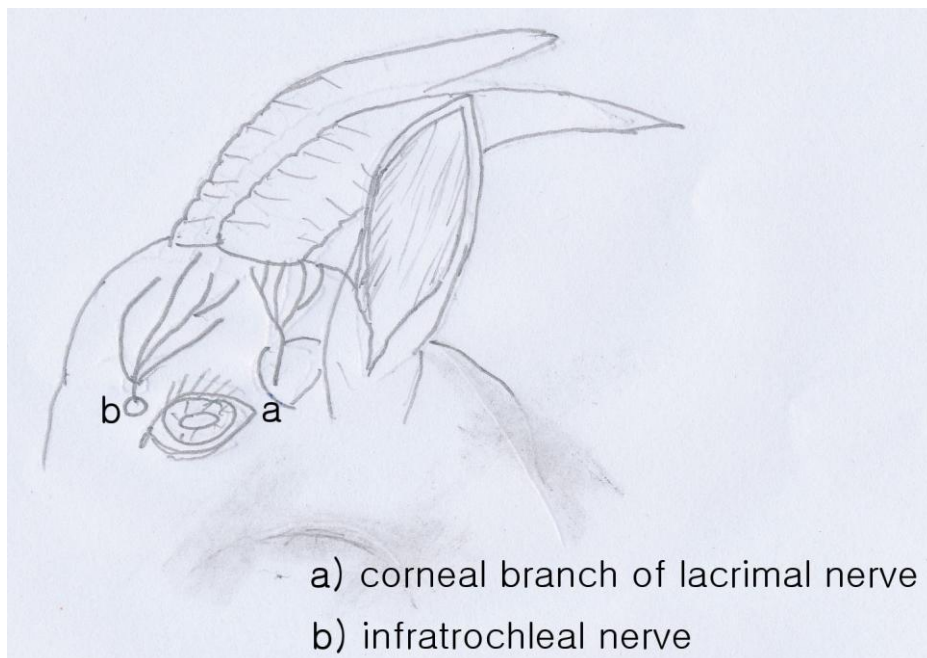
Knauer, Barrell et al. 2023) . Lignocaine toxicity in kids is a concern as the miniature breed kids presented for disbudding can weigh 2 kgs or less. The toxic dose for a 2 kg kid is only 1 ml of 2% lignocaine.

- Tri-Solfen® did not help with the pain of disbudding but may have had an effect between 2 and 4 hours afterwards (Boto 2015)

Dehorning or horn tipping

Sometimes a goat needs to be dehorned or tipped for the same reasons for disbudding. If a horned goat is to be introduced into a group of disbudded or poll goats, then a lot of bullying can result and this can cause damage, especially to udders. Sometimes a horn grows into a head or presses onto the face or can be broken and fly blown, and so needs to be removed.

Goats have 2 nerves supplying each horn so goats need two horn blocks per side, one behind the zygomatic arch and one above the top eyelid just above the medial corner. Lignocaine can be toxic to kids so care must be taken not to exceed the toxic dose, which is 10mg/kg. Lidocaine toxicity causes convulsions and respiratory and cardiac arrest resulting in death.



Adult goats that are dehorned can bleed a lot, so electrocautery will be needed to control the bleeding and also destroy the horn growing tissue around the hole into the frontal sinus. These holes should be bandaged and will take months to heal. Adult bucks should not be dehorned as their horn bases are just too big. It is a good idea to also have some "Bleedsolv"® handy - see <https://www.bleedsolv.com/> . Below are the links to the author's videos of :

Horn tipping - <https://www.youtube.com/watch?v=L4-2sEK8zil&t=22s>
and

Horn removal - <https://www.youtube.com/watch?v=qeGoqPtN0D4>

Castration

Banding is commonly used by breeders and commercial goat producers. Castration is often delayed due to a desire to achieve maximum urethral diameter to prevent urinary calculi in pet wethers. However male kids are fertile at 3 months of age, so there is a need either to separate male kids or castrate them before this age. There is only 1 reference on the effect of delaying castration and urethral growth and this found the maximum diameter was achieved at 8 and 10 weeks of age

(Kibria, Rahman et al. 2016). Therefore between 2 and 3 months is a good age to surgically castrate kids. In Queensland, castration of kids after 2 months is an act of veterinary science although the “Australian Industry Welfare Standards and Guidelines – Goats” allows castration up to 6 months of age (AHA 2020) by suitably skilled goat owners.

The xylazine and ketamine combination is a common anaesthesia used for castration, combined with locally applied lignocaine. The whole process is shown in the following author’s YouTube video - <https://www.youtube.com/watch?v=r2dUqeBsK8A&t=73s> . Meloxicam, in the form of “Buccalgesic Gel”®, is administered prior to anaesthesia and every 36 hours afterwards for 3 treatments.

Pain relief

Recent guidelines for dairy cattle have been released and stresses the need for pain relief for necessary husbandry procedures in order to maintain their industry’s social license to operate (Roche, Saraceni et al. 2025). There has been significant progress in products for sheep pain relief for husbandry procedures (Small, Fisher et al. 2021) but no progress in getting any of these products registered for goats. There was some research on goats in a systematic review but these showed only a slight reduction in half life of meloxicam (subcutaneous, intravenous or oral) compared to sheep (Small, Fisher et al. 2021). This is in contrast to their findings for intravenous ketoprofen where the dose rates needed to suppress prostaglandin release was double (3mg/kg compared to 1.5mg/kg) and the half life was also reduced (0.63 hour compared to 0.18-0.19 hour). This useful website hosts a chapter of John Matthews’ “Disease of the Goat” and lists the dose rates he suggests for Non-steroidal Anti-inflammatory Drugs (NSAIDs) and opioids drugs https://onlinelibrary.wiley.com/doi/pdf/10.1002/9781119073543.app1?fbclid=IwAR3Cey1VwiPo7gSbL_BjBWSa9_KNcVAbRBvM9CtCATqGv19zxhNpGNVowC0 .

The administration of a NSAID can help after kidding if the doe has bruising or had to be helped to deliver kids vaginally and the author has noted this can help the doe to accept and care for her kids.. Since the publication of use of flunixin in improving outcomes of treating ewes with pregnancy toxemia (Zamir, Rozov et al. 2009), many veterinarians are using NSAIDs in treating does with pregnancy toxemia. Does with clinical mastitis or metritis can benefit from NSAIDs as well as antibiotics.

Goats with Caprine Arthritis Encephalitis (Small Ruminant Lentivirus) often have chronic arthritis and need NSAIDs for long periods. In the U.S.A., the use of human oral meloxicam tablets is common. In Australia, “ILIUM BUCCALGESIC OTM”® and “BUTEC”® have been used every 36 hours. Absorption across the gums may prevent gastric ulcers that have been reported in dogs (Mabry, Hill et al. 2021) given long courses of oral NSAIDs. The author’s preference is “Buccalgesic Gel”® as it is tolerated well by goats and they don’t object to the taste when given between the back teeth and gums. However Troy have now introduced a 200ml container of “BUTEC”® and this is more practical for smaller goat herds than the 450ml size of “ILIUM BUCCALGESIC OTM”®.

The use of any pain relief drugs in goats is “off label” so in most states, owners will need a veterinarian’s prescription. Veterinarians in Australia must decide on the with-holding period (WHP) for meat and milk without the resources or government policy available in other countries. Australia has no default WHP. New Zealand has defaults for meat and milk (91 days for meat, 35 days for milk). Australia also has no guidelines for veterinarians writing prescriptions for minor species like goats. In the United Kingdom, there is a government policy to use 1.5 times the longest WHP for other livestock when using in goats. In the USA veterinarians can access to the Food Animal Residue Avoidance Database (<http://www.farad.org>) for advice when treating goats. Australian veterinarians must decide on WHPs by considering the goat’s faster metabolism of drugs against any possible

higher dose rate and more importantly, the need to be below the Level of Detection in meat or milk products. If the veterinarian is convinced the goat will never enter the food chain as it is a pet, then they can just use 6 months as the WHP for meat.

Goat owners of dairy goats often want meloxicam in some form for disbudding and meloxicam is often requested for castration of miniature breed male kids for later sale as pets. "ILIUM BUCCALGESIC OTM"® and "BUTEC"® are Schedule 6 but only registered for sheep and cattle and also only come in 450 mls containers, so veterinarians can help by providing a prescription and a small volume of product. Alternatively they can provide a low-volume, oral formulation for dogs with a prescription. Commercial mohair and goat meat producers are very aware of the need to maintain a social license to produce goat products (Meibusch 2024) and also want to use NSAIDs for castrations and need a prescription in case of a Livestock Production Assurance audit.

For more advanced arthritic pain, some veterinarians have tried additional medications in addition to NSAIDs. There is very little research but one study of a single oral dose of 15 mg/kg gabapentin showed that it is detectable in the plasma for 60 hours (Kleinhenz, Davis et al. 2024). Another dose used in a second paper was 10mg/kg given either orally or intravenously (Costa, Winslow et al. 2024) however 3 out of 8 goats became ataxic following IV administration and one of these went down. Numbers in both studies were very low (less than 10). However some veterinarians are adding gabapentin to a NSAID either once or twice a day but warn goat owners to look out for signs of overdosing i.e. sedation or ataxia. There is also a worry about accumulation with multiple doses.

Adequan has been used in other species especially horses, but there is no research on its use in goats. Low doses of ketamine are also an option used in other species although probably impractical unless the goat is hospitalized. Acupuncture and TENS units have also been trialled by individual veterinarians with goat patients, but there is no research published of their use in goats.

References