

On the farm procedures, anesthesia and analgesia

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Abstract

Common on-farm small ruminant procedures include usual routine husbandry practices such as docking, disbudding and castration. It seems that more people own pet sheep, goats, and/or camelids than a decade ago. These pets may require additional procedures such as castration of older animals and teeth care. Historically these procedures were performed without attention to anesthesia and analgesia. Roadblocks to implementing better pain mitigation include practicality, cost of treatments, availability of legal-to-use drugs, and determining meat and milk withdrawal times. In order for veterinary practitioners to perform procedures and provide better pain mitigation and potentially teach some of these methods to progressive producers, we need pharmaceutical companies, other agency partners, and regulatory agencies to work with us to overcome current obstacles. Local anesthetics such as lidocaine or mepivacaine are not approved for use in the small ruminant species in the US. Use of these agents would also require a change in the thought process as adding a step to any process requires more time to complete the procedure. Changing peoples' behavior is challenging unless there are obvious benefits such as improved weight gains or less procedural complications documented.

Key words: small ruminants, sheep, goats, anesthesia

Résumé

Parmi les procédures courantes faites à la ferme chez les petits ruminants on retrouve les pratiques d'élevage de routine comme la caudectomie, l'ébourgeonnage et la castration. Il semble que beaucoup plus de gens ont des moutons, des chèvres et/ou des camélidés de compagnie qu'il y a 10 ans. Ces animaux de compagnie peuvent nécessiter d'autres procédures comme la castration des vieux animaux et le soin des dents. Par le passé, ces procédures étaient faites sans analgésie et anesthésie. Les embuches pour l'adoption de pratiques qui atténuent la douleur incluent le côté pratique, le coût des traitements et la disponibilité de drogues licites. Il faut aussi déterminer le temps de retrait des drogues pour la viande et le lait. Afin que les praticiens vétérinaires puissent faire ces procédures tout en atténuant la douleur et qu'ils puissent transmettre certaines de ces méthodes aux producteurs plus ouverts, il sera nécessaire que les compagnies pharmaceutiques, les autres intervenants et les organismes de réglementation travaillent de concert avec nous pour surmonter les obstacles actuels. Des produits

anesthésiques comme la lidocaïne et la mépivacaine ne sont pas approuvés pour utilisation chez les petits ruminants aux États-Unis. L'utilisation de ces agents demanderait aussi un changement dans la mentalité car rajouter une étape de plus à tout processus demande plus de temps pour compléter la procédure. Changer l'attitude des gens représente un défi à moins qu'on puisse démontrer des bénéfices évidents comme une augmentation du gain de poids ou une réduction des complications liées aux procédures.

Surgical Procedures

Common on-farm sheep procedures include docking and castration of lambs < 1 month old, wound repairs, fly strike treatment, and older ram lamb castration, especially for pet sheep. Much of the sheep industry has adopted bloodless tail docking by applying elastrator bands. The advantages of this method are readily apparent as the procedure is easy for 1 person to perform, is bloodless, and requires minimal investment in terms of cost of elastrator pliers and bands. The complications are rare, but stored bands weaken over time so small flocks often have to purchase new bands before they have used all those in their existing inventory. Orange-colored bands appear to apply more constriction than green-colored bands, even though the material appears very similar. Alternative methods exist but are used less often. These include hot iron docking, burdizzo or emasculator use.

Financial marketplace disincentives no longer exist for marketing young intact ram lambs or buck kids. Some operations struggle to manage intact ram lambs separately from their ewe lambs; the same can be said for some goat operations. On these farms, the ram lambs or buck kids should be castrated to prevent early breeding and risk unwanted pregnancies. If the ram lambs are not castrated within the first few weeks of life, then they should be Callicrate banded by the time they are 4 months old, which is a conservative cut-off for when some breeds attain puberty. Callicrate banding has minimal complications, assuming it is done correctly. The bands need to be placed very tightly, and the practice tip provided by a bovine veterinary colleague of incising the skin immediately post-banding are helpful details. This author prefers to remove the scrotal contents distal to the band that are devoid of active blood flow 2 to 7 days after the band is placed. The banded animals should be kept in a clean dry site for 5 to 10 days post-banding. While there are no approved drugs to mitigate pain initiated by the band placement, IV propofol and butorphanol followed by infiltration with a local anesthetic appears to be an effective approach when used in research lambs and goats not in the food chain.

On-farm goat procedures include disbudding of kids, castration of kids, castration of older buck kids, scur removal, trimming and infection treatment of horns, and wound and limb fracture repairs. There are no approved pharmaceuticals to manage pain during and following these. This author has heard anecdotal stories of kids that did not recover from veterinarian-performed disbudding. Safe drugs do exist, and FARAD assists with determining meat withdrawal times.

When disbudding, kids are anesthetized, and the hair around their horn buds should be clipped to get a more effective burn. The combination of 0.005 to 0.01 mg/kg dexmedetomidine and 0.1 to 0.2 mg/kg butorphanol IV or IM using a low dead-space syringe is a safe and effective approach to anesthetizing a kid for disbudding. An example of a low dead-space syringe is an U100 insulin syringe where 1 unit=0.01 mL. Low dead-space syringes are available in 1 mL, 0.5 mL, and 0.3 mL sizes. There is an extra 0.002 mL of whatever medication is drawn up available in the hub of a low dead-space syringe. In a regular syringe, there is an extra 0.084 mL of solution in the hub. When giving this combination IM, it is advisable to dilute it with an equal amount of saline, which may minimize the sting and adds volume to this very tiny injectable amount. The surplus amount in a high dead-space syringe can be a significant amount in sheep and goats. Dexmedetomidine can be reversed with an equal volume of atipamezole if the kid is too deep to comfortably send home or leave unattended. Reversal will also reverse the analgesic properties of the dexmedetomidine. A corneal nerve block with buffered lidocaine should be done prior to hot iron disbudding but after anesthetizing. Prior to starting the process of anesthetizing the kid, the patient's safe dose of lidocaine should be calculated. The maximum safe dose of lidocaine for a sheep or goat is 5 to 6 mg/kg, which is approximately 1 mL of 2% lidocaine per 10 lb (4.5 kg) bodyweight. The addition of a very small amount of 8.4% sodium bicarbonate will minimize the stinging effect of lidocaine. This added amount is equivalent to a 1:10 dilution or crudely speaking it is the amount needed to just ever so slightly turn the 2% lidocaine cloudy. The 2 sites to block are midway between the lateral canthus of the eye and the lateral base of the horn (bud) and the same for the medial aspect which then will block the corneal branch of the zygomaticotemporal nerve and the corneal branch of the infratrochlear nerve, respectively. A 22 gauge 5/8-inch needle works well to administer this solution subcutaneously around the nerve.

Infection of bucks' horns occurs most frequently in the summer shortly before the rut. Sedation is necessary to humanely treat these infections as the affected area of the horn needs to be opened up and flushed. It may also require cautery via a hot iron as the infection usually involves a well vascularized area of the horn. Local (corneal) nerve blocks can be done after the buck has been sedated with IV dormosedan 0.022 mg/kg, with an upper limit of 0.25 mL even if the buck weighs more than 250 lb (114 kg). Ketamine administered at 2.2 mg/kg IV or butorphanol at 0.1 mg/kg IV

can be added if necessary, based on the buck's disposition, facilities or extra hands available. FARAD provides assistance to determine meat withdrawal times. Failure to treat these cases is not acceptable.

A recent book chapter is thorough in its coverage of dosages and details regarding sedative and anesthetic properties of many agents.¹ Withdrawal times are included for common anesthetic/analgesic agents used in most ruminants. These withdrawal times are cited from FARAD and/or from other peer-reviewed references.

On-farm camelid procedures include primarily castration, wound and fracture repair, and transrectal ultrasound examination. For surgical procedures, the cocktail nicknamed "llama lullaby" is safe, efficacious, and cost-effective choice. It can be mixed in 1 bottle as follows: add 1 mL of 100 mg/mL xylazine and 1 mL of 10 mg/mL butorphanol to a 10 mL bottle of 100 mg/mL ketamine. Use this cocktail IM at a rate of 1 mL per 40 lb (18 kg) bodyweight in alpacas, and 1 mL per 50 lb (23 kg) bodyweight in llamas. This cocktail is equivalent to dosing alpacas at the following rates: ketamine 4.6 mg/kg, xylazine 0.46 mg/kg, and butorphanol 0.046 mg/kg, and ketamine 3.6 mg/kg, xylazine 0.36 mg/kg, butorphanol 0.036 mg/kg for llamas. Expected surgical analgesia time is approximately 30 minutes. If needed a half dose can be given mid-procedure to extend surgery time, but recovery time may be prolonged by an additional 20 to 45 minutes. This author recommends blindfolding and placing cotton earplugs once the camelid patient becomes sedated.

For transrectal ultrasound in anxious, fractious, or young camelids or sites where the facilities are lacking, it is advisable to use 10 mg of butorphanol IM ± 10 to 20 mg xylazine mixed in the same syringe. The effect of this sedation will be apparent in 5 to 10 minutes and expected duration is approximately 20 minutes. This author has never tried or needed to reverse this cocktail. Others caution against the use of tolazoline at doses higher than 1 mg/kg given rapidly IV. One reputable source recommends atipamezole dosed at 0.03 mg/kg IV, which is equivalent to 0.38 mL for an average 140 lb (64 kg) alpaca.

Conclusion

Options exist under AMDUCA for practitioners to provide analgesia, sedation and anesthesia in the field when performing routine and less common procedures on small ruminant species.

Reference

1. Seddighi R, Doherty TJ. Field sedation and anesthesia of ruminants. *Vet Clin North Am Food Anim Pract* 2016; 32:553-570.