

Dehorning Dairy Calves to Minimize Pain

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Abstract

Dehorning dairy calves is a necessary practice that should be conducted as early as possible and with appropriate anesthetic/analgesia. With the possible exception of caustic paste, calves perceive and react to acute pain during dehorning when no local anesthetic is used. Additional analgesia has been shown to be beneficial in calves dehorned at or beyond eight weeks of age. A routine dehorning service conducted by trained technicians through a veterinary practice is one means of controlling dehorning protocols on-farm.

Résumé

L'écornage des veaux laitiers est une pratique nécessaire qui devrait être exécutée le plus tôt possible, sous anesthésie et analgésie suffisantes. Les veaux perçoivent la douleur aiguë et y réagissent en l'absence d'anesthésie locale lors de l'écornage, à l'exception peut-être du recours à une pâte caustique. Il a été démontré qu'une analgésie supplémentaire était bénéfique chez les veaux écornés à l'âge de huit semaines ou plus tard. Le recours à un service d'écornage fourni par des techniciens dûment formés et sous la direction d'une clinique vétérinaire représente un moyen de contrôler les protocoles d'écornage à la ferme.

Introduction

Dehorning is a necessary task on dairy farms aimed at reducing the risk of injury to handlers and other cattle. Choosing whether or not to dehorn calves, therefore, is not a debate. However, how we dehorn calves is open for criticism and discussion. Agricultural practices are coming under increasing scrutiny from the public. Common management practices such as dehorning may be negatively perceived and lower the reputation of the industry. Considering this, it behooves all those within the industry – advisers and farm personnel – to carefully choose a dehorning protocol aimed at minimizing pain. A recent survey conducted in the Canadian (Ontario) dairy industry shows that Ontario producers dehorn 78% of dairy calves, with the remainder performed by veterinarians.⁵ Survey respondents reported that 23% of producers who dehorned their own calves used lidocaine nerve blocks for reducing acute pain at

dehorning. Of veterinarians surveyed, 92% used local anesthetics for dehorning. Putting these two figures together indicates that only 35 to 40% of dairy calves in Ontario receive the benefit of a local anesthetic at the time of dehorning. This might be better than expected, but there is certainly room for improvement. How do farms in your practice compare?

The same survey indicated that the most common age in Ontario for dehorning dairy calves was four to eight weeks, and the most common method was using a Rhinehart (electric) dehorner. Survey respondents were asked why they used or didn't use local anesthetic. Common reasons for not using it included cost, time, unaware of it, or considered it unnecessary. Producers used lidocaine primarily for pain management, but considered it cheap and enhanced the safety of the procedure for both the handler and the animal.

Methods of Pain Control

Age

It is generally accepted that the younger the animal is, the less painful the procedure is. Whether this is a function of a physiologic age response or simply the effect of dehorning a smaller horn bud is difficult to separate. In experiments we conducted at the University of Guelph, younger calves (<four weeks old) dehorned with a butane dehorner had substantially fewer head shakes, head rubs and ear flicks (behaviours associated with dehorning pain) in the hours following the procedure, compared with older calves (six to ten weeks old) dehorned with an electric dehorner (Rhinehart).

Method of dehorning

The older the calf and the larger the horn, the more painful the procedure becomes. Thus instead of waiting to use gougers, keystones, or wire on larger horns, it is best to do the calves at a younger age. However, even within the options for burning horns, the smaller devices – Buddex, Portasol, etc. – are a better choice and inflict less post-surgical pain than the Rhinehart or similar device. Another option is caustic paste. Research on caustic paste indicates that a local anesthetic block is unnecessary and the pain response following dehorning is minimal.⁶ The main reported problems with caustic paste are either applying too much, which can lead to eye ablation in severe cases, or applying too

little, which results in regrowth of the horn. However, in a study we conducted at a custom heifer-rearing facility, we observed no regrowth or eye problems in over 200 calves dehorned with caustic paste (data unpublished).

Nerve blocks

Routinely administering a lidocaine block is not that difficult and becomes part of the dehorning routine once the decision to do it is made. Guidance on the procedure should be sought through your veterinarian. We use 5 mL of 2% lidocaine on each side, injected with an 18-gauge, 1-1/2 inch needle. We find the best injection site is usually one-third of the distance from the edge of the eye to the horn, but injected at the approximate level of the eye, below the frontal crest bone (ridge of bone running toward the horn). It is helpful to fan out the lidocaine by slightly angling the injection in different directions. Depositing approximately 1 mL as you withdraw the needle appears to improve success. Many people object to using a block, particularly with smaller calves, because they say they can't tell whether the block worked. We conducted a study in 27 calves, where nine received lidocaine and the others received saline.⁴ The technician administering the blocks was blinded to the treatments, and yet was able to correctly identify all nine calves that were blocked. Further, we recorded the behaviour of these calves at the time of dehorning. The most common behaviour in the non-blocked calves was foot stamping. Calves not receiving a block stamped their feet on average 22 times during butane dehorning, compared to an average of four foot stamps in the blocked calf group. Other behaviours associated with pain (not being blocked) were vocalization, rearing, kicking and falling. Not all non-blocked calves vocalized (less than half), but vocalization only occurred in this group.

Use of non-steroidal anti-inflammatory drugs

These drugs (flunixin meglumine (Banamine®), ketoprofen (Ketofen®)) are similar to Advil®, Tylenol® and aspirin in people. The purpose of administering these products in calves is to help manage pain following the dehorning procedure. The best way to avoid a reason to use these products is to simply dehorn the calves when they are young. There have been several studies now that have found benefits to the additional use of NSAIDs when administered with lidocaine at the time of the corneal nerve block.^{1,2,3} We have found benefits in terms of reduced ear flicks and improved calf starter intake when ketoprofen was administered to calves six to ten weeks old that were dehorned with the Rhinehart electric dehorner. Although we have seen subtle changes in serum cortisol, we have seen no additional behavioural benefit (in addition to lidocaine) of using ketoprofen in

young calves (<4 weeks old) dehorned with a butane dehorner.³ Recently, we have evaluated meloxicam at the time of dehorning (currently unapproved for food animals in the US or Canada). Use of meloxicam at the time of lidocaine nerve block for dehorning calves 10 to 12 weeks of age has caused reductions in ear flicks, pain sensitivity and serum cortisol concentrations. Behavioural benefits in this study have been observed for up to 26 hours post-dehorning, indicating that calves feel pain from dehorning for at least this duration.

Sedation

Many people like to use sedation (usually xylazine (Rompun®)) for dehorning calves. Our recent survey indicated that 44% of veterinarians in Ontario use xylazine for dehorning.⁵ Primarily they indicated that safety, restraint and pain control were reasons for use. It should be noted that there is little pain control benefit to xylazine. If calves aren't blocked, they won't always respond to the dehorning procedure (because of the sedation) but they will still feel it. Thus xylazine without lidocaine is not an acceptable method of pain management for dehorning.

Recommendations for Dehorning

1. Devise calf dehorning protocols with your veterinarian and learn the technical skills, such as administering a local nerve block.
2. Dehorn calves at a young age (< 4 weeks old)
3. If possible, choose either:
 - A. Small dehorner (Portasol or Buddex) + nerve block
 - B. Caustic paste – (no nerve block required)
4. Administer approved NSAIDs for calves dehorned > 4 weeks of age.

Role of the Technician in Dehorning

There is tremendous opportunity for technician dehorning, combined with improving pain management of dehorning within the dairy industry. Offering a technician service to clients allows a dehorning protocol to be implemented, ensures regular dehorning at the appropriate age and even provides opportunity for some heifer health monitoring. At the Ontario Veterinary College, we have had a technician organize and conduct dehorning visits on most of our dairies for many years. Recently, we conducted a dehorning trial on a large local dairy that previously was fitting dehorning into their schedule when they could find time. At the end of the study, they wanted us to provide the dehorning service because of the advantages listed above. A very large dairy practice in New Zealand has recently started a similar service for the same reasons. Interestingly,

analysis of the Ontario dehorning survey data indicated that the use of lidocaine in 100% of the calves for dehorning was over 20 times more likely if the veterinary practice utilized a technician for dehorning dairy calves.

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