

AABP FACT SHEET



PAIN RELIEF IN LAME CATTLE

AABP Lameness Committee

Lameness causes both acute and chronic pain. The pain of lameness is reflected in altered locomotion and weight bearing, and it is associated with diminished animal welfare and productivity. Included in the Veterinarian's Oath are promises to protect animal welfare and prevent and relieve animal suffering. Veterinarians have an obligation to do what they can to mitigate pain in animals, including lame cattle.

PREVENTION, DETECTION AND TREATMENT OF LAMENESS-CAUSING CONDITIONS

The first step to reducing the prevalence of lameness pain is prevention. Lameness may result from infectious diseases such as foot rot and digital dermatitis, or from non-infectious diseases such as sole ulcer, white line disease, and toe lesions. Facilities and management practices should minimize the incidence of lameness in the herd (see the Lameness Committee document "Overview of Lameness in Cattle" for specific preventive practices). When lameness does occur, it should be detected and treated as soon as possible. Regular observation of cattle for signs of lameness and developing a protocol for early intervention and effective treatment is a priority. Treating the pain of lameness without addressing its underlying cause is of limited benefit. The most effective way to alleviate pain in lame cows is to effectively treat the underlying cause of the lameness early in the course of

the disease. Veterinarians who work with animal populations that experience lameness are responsible for continuing education to stay up to date with the most effective treatment strategies.

The transfer of weight bearing away from the affected claw by the application of a correctly positioned wooden or plastic hoof block on the unaffected claw of the affected limb is a significant component of pain control for lame cows. However, additional pain management should also be considered. Analgesic drugs are often not included in treatment protocols for lameness, and for mild cases, this may be acceptable. However, when a case of lameness causes pronounced gait changes, the provision of pain relief is essential.

LAMENESS ANALGESIA

The cornerstone of analgesia in cattle is the use of non-steroidal anti-inflammatory drugs (NSAIDs). Several NSAIDs have been found to provide pain relief in lame cattle and some have not. There is evidence of

improved recovery with the use of effective NSAIDs. NSAIDs include:

- **Aspirin** There is no published evidence of efficacy for oral boluses of aspirin (acetylsalicylic acid) in the alleviation of lameness pain in cattle. Injectable sodium salicylate is not effective in alleviating pain in cattle with an induced joint lameness (Kotschwar et al 2009). Aspirin is not an approved drug for use in cattle in the United States, so the tolerance for residues in milk or meat is zero.
- **Flunixin meglumine** In the US, one flunixin product is approved for "... the control of pain associated with foot rot in steers, beef heifers, beef cows, beef bulls intended for slaughter, and replacement dairy heifers under 20 months of age." This approval is based on the efficacy of the drug for improving the gait of Holstein steers about 48 hours after foot rot was induced by researchers by subcutaneous injection of the causative pathogen (US FDA, 2017). Transdermal flunixin did not improve locomotion in adult dairy cows with researcher-induced arthritis of the distal interphalangeal joint, but it did reduce coronary band temperature and reactivity to pressure (Kleinhenz et al, 2019). Injectable flunixin meglumine did not affect locomotion scores in dairy cows with naturally occurring lameness, but it did decrease weight-shifting

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behavior between the limbs (Wagner et al, 2017). Injectable flunixin is approved for use in beef and dairy cattle in the US, although it is not labeled for the control or alleviation of pain. Withholding times for meat and milk are indicated on the labels of injectable flunixin meglumine products in the US.

■ **Meloxicam** Meloxicam was found to improve locomotion in beef cattle with naturally occurring lameness of the upper or lower limb when compared to saline-treated controls evaluated three days after a single dose (Nagel et al, 2016). Meloxicam is not FDA-approved for use in cattle and there is no regulatory tolerance for residues in meat or milk in the US. The extra-label use of meloxicam in cattle has increased in popularity in the US over the last decade.

■ **Ketoprofen** Ketoprofen has been found to improve locomotion and weight distribution in dairy cows with naturally-occurring lameness (Flower et al, 2008, Chapinal et al, 2010). In the US, it is FDA-approved for use in horses, but not cattle. In Canada, ketoprofen is approved to treat pain in cattle, including the pain associated with lameness due to arthritis and injury, but not other more common causes of lameness pain. Because ketoprofen is not FDA-approved for use in cattle there is no regulatory tolerance for residues in meat or milk in the US.

In lame cows, pain relief should be provided at the time of treatment of the underlying condition and afterward. Procedures performed to correct lesions such as white line disease and sole ulcers are painful (Janssen, 2016), so it is appropriate to provide analgesia preemptively; this may include an NSAID and regional limb perfusion with a local anesthetic drug.

In the treatment of lameness, speed of detection and treatment is imperative in preventing an acute problem from turning into a chronically painful condition. When lame cows were treated with a therapeutic trim, a hoof block on the unaffected claw of the affected limb, and a NSAID (ketoprofen) within two weeks of the development of abnormal locomotion, more than half had returned to normal locomotion within 35 days (Thomas et al, 2015). By contrast, in a study examining cows with abnormal locomotion that had been present for two weeks or more, normal locomotion was observed in only 15%-16% of cows 42 days after the same treatment (Thomas et al, 2016). When lameness treatment was delayed, more than one third of the cows developed lameness in the limb contralateral to the initially affected limb in the 42 days after treatment of the initial lameness (Thomas et al, 2016).

Cow comfort is critically important in lameness pain management. Provision of a comfortable resting space, such as a bedded pack or an

area of sheltered pasture, will encourage the cow to spend more time lying down, providing some respite from the pain. In addition to improving cow comfort, pasturing of lame cows increases their rate of recovery (Hernandez-Mendo et al, 2007). Housing of lame dairy cows in recovery pens with deep straw bedding also improves recovery from lameness when compared to housing lame cows in stalls (Thomsen et al, 2019).

SEVERE OR CHRONIC LAMENESS

When treating severe lameness, appropriate anesthesia and analgesia are imperative. For surgical procedures of the distal limb, the protocol should include intravenous regional anesthesia of the limb. If a hoof trimming chute with adequate leg restraint is not available, the animal may be put in lateral recumbency though the use of heavy sedation. Most commonly, interoperative sedation and analgesia are achieved with a combination of a sedative (such as acepromazine or xylazine), an opioid (such as butorphanol), a dissociative anesthetic (such as ketamine) and an NSAID. Analgesic therapy must be continued post-operatively with sufficient time and frequency to encompass the acute phase of post-operative healing.

Once pain becomes chronic, it is more difficult to control, and local anesthetics are inappropriate for long

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term pain control. The longer the duration and/or the more intense the pain, the more difficult it is to alleviate, requiring higher and/or more frequent doses of analgesic drugs. Moreover, remodeling of P3 in cows with chronic sole lesions increases the likelihood of their recurrence (Randall et al, 2016).

For severe and chronic lameness, euthanasia must be considered. Abnormal locomotion reflects pain, and pain that cannot be managed must be ended. Non-weightbearing chronically lame cows are suffering and are at risk of becoming immobile during transport, and therefore must not be shipped to slaughter. More information about humane euthanasia of cattle may be found at https://aabp.org/Resources/AABP_Guide_lines/EUTHANASIA-2019.pdf.

For more information on pain management in cattle, visit: https://aabp.org/committees/resources/Pain_Brochure_8-15.pdf.

It is essential that the practitioner follow the requirements of the Animal Medicinal Drug Use Clarification Act (AMDUCA) in the United States (or other similar acts in other countries). Guidance from the Food Animal Residue Avoidance Databank (FARAD) should be sought regarding appropriate and current meat and milk withholding times in the US at www.farad.org or call 1-888-USFARAD.

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