

Practical Pain Management in Beef Cattle Practice

Renee Dewell DVM, MS

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1



Why adopt pain management?

- Cattle Feel Pain
- Pain Management Works
- Benefits
- Legal
- Producers will Adapt and Adopt

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Cattle Feel Pain

- EEG Evidence
- Thermography Evidence
- Biomarkers
- Pain Scale

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Pain Management Works

- Physiologic
- Neuroendocrine
- Behavioral
- Multimodal

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Benefits to Pain Management

- Increased Average Daily Gain (ADG)
- Reduction of lameness
- More normal mobility
- Decreased disease incidence

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Legality of Pain Management



DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service
Food and Drug Administration
Washington, DC 20507

JUL 18 2014

K. Fred Gingrich II, DVM
Vice President, American Association of Bovine Practitioners
Country Roads Veterinary Services, Inc.
776 Main Street, RD 43
Ashland, OH 44805

Dear Dr. Gingrich:

This letter is in response to your July 7, 2014 email addressed to Dr. William Flynn of the FDA, Center for Veterinary Medicine. You had inquired about the extended use of meloxicam in horses for the treatment of musculoskeletal conditions such as laminitis and colic. Dr. Flynn had provided a partial response to your inquiry but also indicated that we would send you a letter more fully addressing our response.

The regulatory authority extended drug use to animals. Title 21 Code of Federal Regulations Part 314.101 states that "such use is limited to recurrent modulation when the health of an animal is threatened or suffering or death may result from failure to treat." We consider the use of analgesics and anesthetics for the purpose of alleviating pain, suffering and discomfort in animals as an acceptable justification for using approved drugs in an extralabel manner.

"We consider the use of analgesics and anesthetics for the purpose of alleviating pain, suffering and discomfort in animals as an acceptable justification for using approved drugs in an extralabel manner."

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Producers will Adapt/Adopt



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7



Evaluation of an Interactive Workshop Designed to Teach Practical Welfare Techniques to Beef Cattle Caretakers and Decision Makers (*Journal of Extension*)

Renee Dewell, Christy Hanthorn, Jared Danielson, Rebecca Burzette, Johann Coetsee, D. Dee Griffin, Alejandro Ramirez, and Grant Dewell

• Improvements in perceived competencies and estimated likelihood that the material will be utilized

- More likely to use or recommend use of local anesthesia for dehorning and castration
- More inclined to utilize meloxicam for pain management
- “Somewhat Better” to “Much Better” at performing all skills taught in the workshop after completing the workshop

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Professional Obligation & Veterinary Oath

- Recognizing and addressing pain in cattle is part of our professional obligation and veterinary oath

“As a member of the veterinary medical profession, I solemnly swear that...I will strive to promote animal health and welfare, relieve animal suffering...”

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9



Our Profession is encouraging it

AABP FACT SHEET

PRUDENT USE OF SYSTEMIC PAIN RELIEF FOR LAMENESS

Authorized by
THE AABP LAMENESS
COMMITTEE

Introduction

Pain can be divided into acute pain associated with surgical procedures, or chronic pain associated with disease processes, and relief of pain in animals is an important part of the practice of veterinary medicine.

Acute pain associated with procedures can in most cases be managed with local anesthetics alone or in combination with shorter acting analgesics such as opioids and alpha-2 adrenergics. Occasionally, general anesthesia is necessary. Control of movement, immobilization of the animal, and provision of a quiet resting space, such as a box or stall, are also important.

Conclusion

This fact sheet will discuss the options for systemic pain relief available to the practitioner. Details of hoof block application, intravenous regional anesthesia, and use of regional blocks in the field are discussed in separate fact sheets.



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AABP Guidelines on Castration/Dehorning

- First written in 2014
- Regularly reviewed and updated
- Dehorning and castration now separate guidelines



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AABP Dehorning Guidelines (Nov 2019)

- AABP recommends that pain management be considered the standard of care during all dehorning and disbudding procedures
- Local
 - Mitigates procedural pain
 - Up to 5 hours analgesia
- Systemic
 - Extends analgesia
 - Up to 48 hours following administration



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AABP Castration Guidelines (Aug 2019)

- Local anesthesia
 - AABP: "...veterinarians are encouraged to work with clients to advance its use."
 - Mitigates procedural pain
 - Up to 5 hours analgesia
- Systemic pain relief
 - AABP: "...consideration should be given to providing pain mitigation therapy during the recovery and healing period..."
 - Extends analgesia
 - Up to 48 hours following administration



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Pain Mitigation

- Doable
- Practical
- Economically Feasible
- Safer for Veterinarian
- Good for the Bovine

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Analgesic/Anesthetic Agents

- Local anesthetics
- NSAIDs
- Opioids
- Alpha-2 agonists
- N-methyl-d-aspartate receptor antagonists

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Lidocaine



- **Cost:** \$2.33 for 100ml
- **Dosage:** 1.5 mg/kg
 - Approx. 1 ml/200 lbs epidural
 - Max of 10 mg/kg toxic dose
- **Onset of action:** Almost immediate
- **Duration:** ~90 minutes
- **Withdrawal:** 4 Days

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Lidocaine Administration



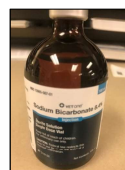
- Multi-dose Syringe**
- Allows you to do multiple animals
 - Time saver!
 - Approximately \$35.00

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Bicarbonate



- May enhance analgesia
- May decrease onset of analgesia
- May decrease duration of analgesia
- Use 10:1 lidocaine:bicarb ratio
- **Cost:** \$7.74 for 100 ml

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Magnesium Sulfate



- Combine with lidocaine
- Can increase time to onset of action
- May increase duration of analgesia
- Use 5:1
- **Cost:** \$4.36 for 10 ml

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Oral meloxicam



- **Cost:** 3c/15mg tab or \$0.09/100 lbs BW
- **Dosage:** 45mg/cwt
- **Withdrawal:** 21 days (30 days if multi-day use)
- Oral meloxicam at 1mg/kg has a half-life of 27 hours
- Meloxicam tablets have 100% oral bioavailability

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Meloxicam Administration



- #7: \$0.15
- #12: \$0.23
- Can have techs fill
 - Pre-fill for various weights
- Use a balling gun

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Administering Meloxicam PO

Pex Tubing:
Barrel: (3/8" ID x 15")
Tablet Push Rod: (1/4"

To LOAD Tablets:
Withdraw tablet p
Load tablets & all
Hold DEVICE at ju
Slide device past



Dr. Dee Griffin
-DGriffin@WTAMU.EDU
-DGriffin@TAMU.EDU

(cattle)
8" longer barrel
Rod Stop
Administering tablets

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Transdermal Flunixin



Image courtesy of Merck Animal Health

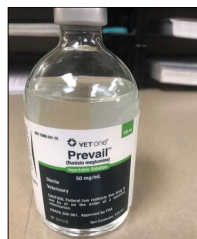
- **Cost:** \$27.89 for 100 mL
- **Dosage:** 3ml/cwt
- **Withdrawal:** 8 days
- Labeled for:
 - Pyrexia assoc. w/ BRD
 - Pain assoc. w/ foot rot
- Skin must stay dry for 6 hours post application

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Injectable Flunixin



- **Cost:** \$11.30 for 100 ml
- **Dosage:** 2.2mg/kg (1 ml/cwt)
- **Withdrawal:**
 - 4 days (IV)
 - >30 days (IM)
 - Violative residues possible
 - Significant tissue damage

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Oral Gabapentin



- **Cost:** \$0.09/100 lbs
- **Dosage:** 20 mg/kg (PO)
- **Withdrawal:** 21 days
- Gabapentin tablets have 8 hour half-life
- Can be used alone
 - More effective in combo with meloxicam

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Pain Mitigation

- Disbudding/Dehorning
- Castration
- Dystocia
- Scours
- Lameness

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Disbudding/dehorning

- Cornual block
 - One injection
- Ring block
 - Multiple injections
- Local site infiltration
 - Shorter delay
 - Less technical skill
 - May bleed more w/o epinephrine

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Performing blocks

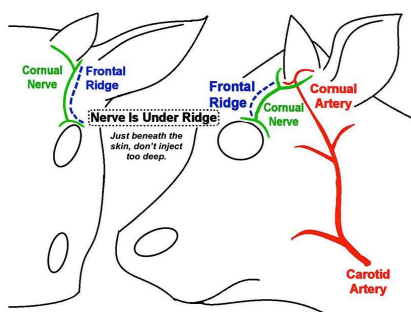


- Large Animal Consulting and Education
- RACE approved
- Dr. Meredyth Jones
- <https://largeanimalce.com>

Large Animal
Consulting & Education

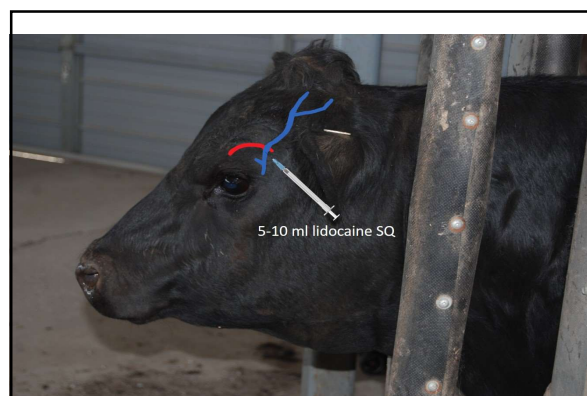
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Cornual Block

Before



After



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Takes <20 seconds to perform blocks

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A new method of administering local anesthesia for calf disbudding: Findings from a comparative on-farm study in New Zealand

A.J. Bates^{1,2}, M.A. Sutherland³, F. Chapple², S.K. Dowling³, A.P. Johnson², B. Saldias¹, J. Singh²

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Pain mitigation at Castration

- Makes procedures safer
- Less discomfort for animal
- Potential growth and performance benefits
- Get ahead of any future pain mitigation requirements for audits/certifications

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Pain mitigation at Castration

- PO meloxicam can reduce inflammatory responses in weaned calves
- Flunixin has benefits
- Combine with lidocaine block
- Consider an epidural with larger cattle
- Consider avoiding xylazine if unweaned

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What about banding

- Can be painful for 3-4 weeks
- Multimodal pain relief
- Consider an epidural at time of banding
 - Larger animals
- Block cords
- Provide meloxicam
 - Consider multiple day treatment if possible

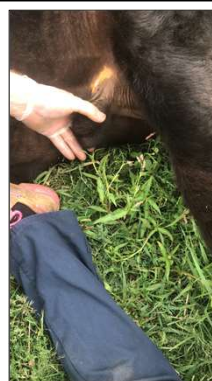
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Dystocia Calves

- May improve short term ADG
- Assumed increased milk intake/more feeding bouts



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Dystocia Cows

- Express greater pain compared to eutocic cows
- May note increased milk production
 - Could positively impact calves
- May increase weight bearing on hind limbs
- Possible calves may benefit from mammary secretion
- Avoid flunixin



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Scouring Calves

- Meloxicam may be a supportive therapy
 - Potential anti-endotoxin effects
 - Positive (+) effects on signs of pain
 - Improved behavior
 - Improved appetite/feed intake
 - < likely to require additional treatment



Lameness

- Treat early/cull early
- Foot blocks
- Multimodal approach:
 - Combo of meloxicam and gabapentin



Lameness- acute

- Local anesthetics
- Opioids/alpha-2 adrenergics
- Control/restrict movement
- Comfort measures



Lameness-chronic

- Address underlying issue
- ~~Corticosteroids~~
- Opioids- Butorphanol, morphine
- Alpha-2 adrenergic agonists- xylazine
- NSAIDs



Lameness

- Consider regional blocks for procedures
- Consider epidural for pelvic limb lameness
- Remember transdermal flunixin is labeled for pain associated with foot rot



Bier Block

- Tourniquet
- 15-30 mls 2% Lidocaine
- 20 gauge butterfly catheter
- Syringe



Bier Block



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Interdigital Block

- Consider when foot is very swollen
- Will block both phalanges
- Need
 - 18 gauge 2" needle
 - 30 mls 2% lidocaine
 - Syringe

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Inject Front of Foot



- $\frac{3}{4}$ - 1 inch above coronary band
- Bury to hub
- Inject 15 mls on way out

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Inject Back of Foot



- $\frac{3}{4}$ - 1 inch above coronary band
- Bury to hub
- Inject 15 mls on way out

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Lameness- epidural

- Consider L-S epidural for pelvic limb lameness
- 0.1 mg/kg up to 0.5-1 mg/kg morphine
- Dilute in 10-20 mL saline
- 18-20ga x 4-5" spinal needle
- Can use morphine q 12 hours

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Pain Mitigation

- Doable
- Practical
- Economically Feasible
- Good for the Bovine
- Safer for Veterinarian

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Thank You

rdewell@iastate.edu

970-231-9654



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55



Questions?

*To ask questions, type into the Q&A or Chat.
To find these options, hover your mouse over the screen and click on the chat or question icon. If not visible, click bubble with three dots and select Q&A*



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