



# Kansas State University Research Foundation TECHNOLOGY LICENSING PROFILE

Oral administration of meloxicam in cattle improves growth following dehorning and reduces incidence of Bovine Respiratory Disease after castration

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**Description:** Research at Kansas State University has shown that the novel use of meloxicam administered by mouth to calves at 1 mg/kg reduces the incidence of bovine respiratory disease (BRD) after castration and increases the rate of weight gain after dehorning. In the U.S., at least 4 M calves/year are dehorned and producers castrate at least 8 M calves/year (NASS, 2010).

Meloxicam is a non-steroidal anti-inflammatory drug (NSAID) of the oxicam class that is approved in the EU for adjunctive therapy of acute respiratory disease; diarrhea and acute mastitis in cattle when administered at 0.5 mg/kg IM or SC. There are no approved oral formulations of meloxicam for use in cattle.

## Advantages of Technology:

- Improves weight gain after dehorning
- Reduces incidence of BRD after castration
  - BRD is 3X more likely in bulls castrated on arrival at feedlot than steers
- Currently no drugs approved by the FDA to provide analgesia in food animals in the US
- NCBA and AVMA encourage the use of local anesthetics and analgesics to minimize pain & stress associated with dehorning and castration; at this time there is no requirement to do so.

**Patent Status:** US Issued Patent Number 8,791,105

## Applications of Technology

**Dehorning:** Improves weight gain following dehorning

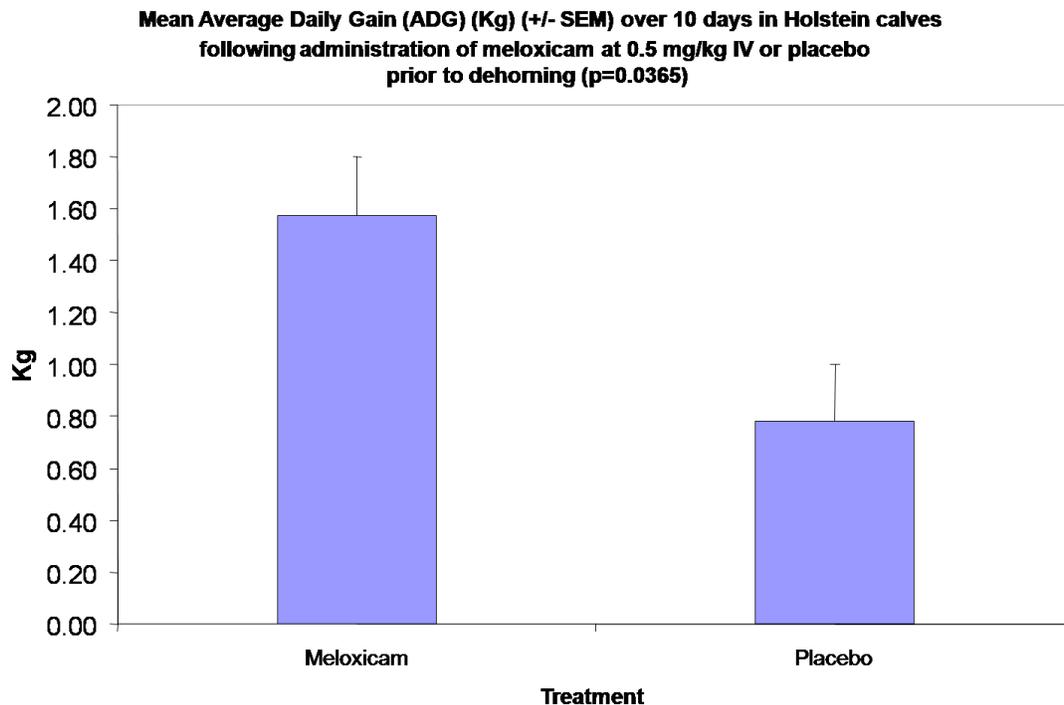
**Study:** The study was conducted to determine the pharmacokinetics of meloxicam and its effect on serum cortisol, heart rate, behavior and weight gain in calves after scoop dehorning without local anesthesia. Twelve Holstein steers (16 wks of age) were randomly assigned to receive either meloxicam at 0.5 mg/kg IV (n=6) or a placebo IV immediately (<30s) prior to scoop dehorning with a Barnes dehorner and thermocautery.

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**RESULTS.** In **Figure 1** below, bodyweight was determined prior to dehorning and at 6 and 10 days post-dehorning. The study findings suggest that administration of meloxicam could have long term performance benefits.

**Figure 1**



**Castration:** Reduces incidence of BRD (disease prevention); Also, reduces reliance on antimicrobial methods for disease treatment

**Study:** The study involved 258 cross-bred male beef calves (145 bulls and 113 steers). On arrival to the K-State beef stocker facility, calves were randomly allocated to treatment group by gender status (bull or steer) to receive either 1 mg/kg meloxicam or 1 mg/kg of lactose monohydrate placebo. Approx. 24 h after arrival all calves were blood sampled to determine meloxicam concentrations and received a dose of ceftiofur crystalline free acid, a modified-live BRD vaccine (for viral BRD), and an anthelmintic injection at processing. At this time bull calves were surgically castrated using a Newberry knife. Calves were monitored twice daily for signs of BRD. Calves were individually weighed on day 0, 14, and 28.

**RESULTS.** In **Figure 2** below, bull calves receiving meloxicam prior to castration were almost 50% less likely to develop BRD compared with placebo treated controls. There was no evidence of effect modification in steers for BRD treated with meloxicam compared with untreated control steers.

**Figure 2.**

