

The effects of a non-steroidal anti-inflammatory drug on behavior and physiological parameters of beef cows and calves assisted at calving

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Introduction

An assisted calving can negatively impact the health and behavior of beef cows and calves. Non-steroidal anti-inflammatory drugs (NSAIDs) administered after a difficult calving to the cow or the calf as a pain mitigation strategy have been shown to improve behaviors in dairy cows and calves, weight gain in beef and dairy calves, and vigor in dairy calves. However, the effects of NSAIDs on beef cows' and calves' behaviors related with pain and cow-calf bonding after an assisted calving have not been studied. Therefore, the objective of this study was to investigate the effects of administering an NSAID to beef cattle after an assisted calving by measuring changes in behaviors related with pain and the cow-calf bond, transfer of passive immunity in calves, and physiological parameters related with pain.

Materials and methods

The study was conducted on a cow-calf operation in southern Alberta, and 23 cow-calf pairs were enrolled after calving assistance. Baseline parameters such as dam parity, calving ease score, calf presentation, calf sex, calf birthweight, calf blood lactate and vigor score were collected within 10 minutes after calving. Cow blood samples for measuring serum haptoglobin concentration and infrared thermography (IRT) images of the vulva of the cow and the head of the calf were taken within 10 minutes after calving assistance. The cow-calf pairs were randomly allocated by parity (heifer or cow) and calving ease score (easy: 1 person pulling to deliver the calf; or difficult: 2 or more people pulling, or a calf jack used) to either treatment with meloxicam (Metacam[®], 20 mg/ml, 0.5 mg/kg body weight, Boehringer Ingelheim, Ingelheim, Germany) or a placebo (0.025 ml/kg). The pairs were then placed in a box stall under video surveillance for 24 hours for behavior analysis. At 24 ± 1 hours, a human approach test and separation test were performed. The cow and calf were then restrained for collection of IRT images of the cow's vulva and the calf's head, and blood samples were collected to measure haptoglobin concentrations in the cow and IgG concentrations in the calf. The cow and calf were reunited in the box stall for 10 minutes for additional behavior analysis. Descriptive statistics, multivariable linear or logistic regression models, and non-parametric tests were used to analyze the data.

Results

There were no significant differences between baseline parameters in the calf for meloxicam and placebo treatment groups. Physiological parameters (i.e., haptoglobin concentrations in the cow, serum IgG concentration in the calf, or changes in temperature in the cows' vulva or calves' head) did not differ significantly by treatment group ($P > 0.05$). Additionally, there were no significant differences between meloxicam and placebo groups for any of the cow behaviors (i.e., time spent lying in sternal recumbency, standing, feeding, self-grooming, grooming the calf, and frequency of flicking her tail, raising her tail, and pressing against the box stall) ($P > 0.05$). However, calves that received meloxicam were more active ($P = 0.04$; median: 15.3%, IQR: 13.0-19.4) than calves that received a placebo (median: 10.9%, IQR: 8.9-14.5%) and played more ($P = 0.01$; median: 0.61 counts/hr, IQR: 0.17-1.09) than calves that received a placebo (median: 0.02 counts/hr, IQR: 0-0.58).

Significance

This study demonstrated that calves that received meloxicam performed more play behavior and were more active than calves that received a placebo. However, no difference was detected between cattle treated with meloxicam or a placebo in terms of physiological parameters, cow behaviors or behaviors associated with the cow-calf bond. The results from this study may indicate that the anti-inflammatory effects of meloxicam resulted in improved calf welfare as demonstrated by active behaviors, specifically playing, and may be a useful tool for producers to use in calves to mitigate pain associated with calving assistance.

