

The effect of pain mitigation during cautery disbudding of neonatal goat kids on subsequent health and performance

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Introduction

Disbudding of goat kids is a necessary but painful procedure that causes both acute and longer-term pain. Currently, most goat kids are disbudded using cautery without any pain control. Pain mitigation has been shown to improve measures of acute pain response, but little is known about the effects on longer term health and performance outcomes. The objective of this study was to investigate the effect of pain mitigation using a combination of xylazine, meloxicam and lidocaine on growth and health outcomes compared to kids disbudded with no pain control.

Materials and methods

This study was conducted on a commercial goat dairy during the summer of 2021. One day prior to disbudding, eligible kids were weighed and evaluated using the UMN Goat Kid Health Scoring System (6 categories, scale of 0 - 2 with 2 = obtunded, unwilling to rise, excessive mucoid nasal discharge, tense or bloated abdomen on palpation, fecal staining down the legs, or a rectal temp < 98.6 or > 105°F) and excluded from the study if they was a 2 in any category or had a cumulative health score of ≥ 4 . Kids were then allocated by ear tag number into either control (CON; disbudded with no pain control) or treatment (TRT; disbudded after receiving a standardized pain mitigation protocol including one 7.5mg tab of meloxicam, 0.23mg xylazine IM, and a nerve block using a 1:9 buffered lidocaine solution, 0.25 mL per nerve site [1 mL total/kid]). All kids were restrained in a disbudding box, and underwent cautery disbudding with each bud cauterized for a total of 7s. After disbudding, horn buds were sprayed with a protective aluminum spray in both treatments. TRT kids were allowed to recover from their sedation. For 6 weeks post disbudding, all kids were weighed and health scored once per week by study technicians. Farm treatments and mortality events were collected from farm records. The effect of treatment on post disbudding weight gain was evaluated using linear mixed models accounting for the effect of treatment, week, the interaction of treatment and week, birth weight, the random effect of breed and pen, and repeated measurements by kid. The effect of treatment on post disbudding morbidity and mortality was evaluated using cox proportional hazards models, accounting for breed and pen. Treatment effects on technician reported health scores were evaluated using generalized estimating equations, accounting for pen and breed and repeated measures by kid.

Results

Fifty goat kids were excluded from enrollment, leaving 510 total goat kids enrolled in the study (TRT, $n = 256$; CON $n = 254$). Enrollment characteristics did not differ between treatment groups. Kids weighed an average of 4.4 ± 1 kg and were 8.7 ± 3 d old at the time of disbudding, doelings made up the majority of enrollment by sex (98%), and the predominant breeds represented were Saanen (48%) and Alpine (28%). There was no treatment effect on body weight (kg) in the 6 weeks post disbudding ($P = 0.59$). Nineteen kids (7.5%) died in each treatment group over the observation period, with no difference in the risk of death between treatment groups (HR: 1.01; 95% CI (0.53, 1.91); $P = 0.98$). There was no effect of disbudding treatment on the risk of farm treatment for scours or pneumonia post disbudding (HR: 1.07; 95% CI [0.89, 1.28]; $P = 0.45$) nor was there an effect of disbudding treatment on the odds of an abnormal health score (≥ 4) (OR: 1.13; 95% CI [0.86, 1.48]; $P = 0.38$).

Significance

Under the conditions of this study, we observed no effect of pain mitigation including xylazine, meloxicam and buffered lidocaine on measured health and performance outcomes in the 6 weeks post-disbudding as compared to a positive control. Despite these results, pain mitigation should still be used for the disbudding procedure to manage acute pain. Further work is needed to explore other long-term effects, and to investigate if other combinations of pain mitigation medications may impact health and performance.

