BEEF CATTLE RESEARCH UPDATE

Britt Hicks, Ph.D., PAS
Area Extension Livestock Specialist
Oklahoma Panhandle Research & Extension Center

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Effect of Band and Knife Castration of Beef Calves of Different Ages

Castration of beef cattle is routinely performed in the U.S. to mitigate aggressive and sexual behavior and improve meat quality. The most common castration techniques include surgical removal of testes or application of a restrictive elastic band. Canadian research from the University of Calgary and the Lethbridge Research Centre in three experiments evaluated the effect of band and knife castration on acute pain for the first 7 days after the procedure and on chronic pain up until when the testicles of banded calves had sloughed off in beef calves of three different ages: 1 week of age, 2 months of age or 4 months of age.[1,2] All calves were blocked by age and weight and randomly assigned to 1 of 3 treatments: sham castration (control), band castration, and knife castration. Experiment 1 evaluated 1-week old Angus bull calves (95 lb), Experiment 2 evaluated 2-month old Angus bull calves (203 lb), and Experiment 3 evaluated 4-month old Angus bull calves (348 lb). For all experiments, physiological and behavioral parameters were collected before castration (day -1 and immediately before castration) and after castration (60 and 120 minutes, and on day 7) to assess acute pain. Behavioral and physiological indicators of chronic pain were collected weekly until the testicles of banded calves had sloughed off (68, 49, and 42 days, respectively, for experiments 1, 2 and 3).

These researchers reported that results from this study indicate that physiological, behavioral, and clinical-pathological indicators of pain/stress are significantly influenced by both the method and age of the calves when the castrations were performed. Knife and band castrations caused behavioral changes indicative of acute pain in all age groups assessed in this study; however, only 2 and 4 month old calves presented physiological differences associated with pain. One week old knife castrated calves displayed differences in behaviors on the day of castration, whereas band calves displayed changes in behavior up to 2 and 3 days after castration, suggesting that knife castration caused pain and/or stress for a shorter period of time compared to band castration.

The knife 4 month old calves presented a greater number of behavioral indicators of pain compared to 2 month old knife calves. Knife castrated 4 month old calves presented differences in behavior up to 5 days after castration, whereas band calves exhibited differences up to 3 days after castration. Consequently, band castration in 4 month old calves caused acute pain for a shorter period of time compared to knife castration. In 2 month old calves, band castration did not present differences compared to control calves suggesting that band castration results in fewer indicators of pain and thus may be a preferred method in 2 month old calves compared to knife castration.

In the part of study evaluating chronic pain, both, 1 week and 2 month old calves had inflammation in the scrotal area lasting 7 days after knife castration, whereas inflammation was observed for up to 14 days in 4 month old calves. Swelling in band calves lasted for 21 to 28 days in the 2 younger groups of calves, whereas in 4 month old calves swelling was observed until day 35 post castration. No changes in behavior were observed in calves castrated at 1 week or 2 months of age. However, behavioral parameters and clinical-

pathological evaluations showed that band castration in 4 month old calves caused chronic pain lasting 21 days. Knife- and band-castrated calves did not exhibit indicators of chronic pain or distress when the procedures were performed in calves younger than 2 months of age.

These authors concluded that the combined acute and chronic assessments of knife and band castration methods suggested that pain mitigation should be used to improve animal welfare, particularly when performed in calves older than 2 months of age independent of the method of castration. However, when access to pain mitigation is limited, band castration in calves younger than 2 months of age could be used as a strategy to reduce pain/stress.

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[1] Meléndez, D. M., S. Marti, E. A. Pajor, D. Moya, C. E. M. Heuston, D. Gellatly, E. D. Janzen, and K. S. Schwartzkopf-Genswein. 2017. Effect of band and knife castration of beef calves on welfare indicators of pain at three relevant industry ages: I. Acute pain1. J. Anim. Sci. 95: 4352-4366.

[2] Marti, S., D. M. Meléndez, E. A. Pajor, D. Moya, C. E. M. Heuston, D. Gellatly, E. D. Janzen, and K. S. Schwartzkopf-Genswein. 2017. Effect of band and knife castration of beef calves on welfare indicators of pain at three relevant industry ages: II. Chronic pain. J. Anim. Sci. 95: 4367-4380.