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Weaning Method Evaluation for Beef Cattle

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Summary

Weaning is a stressful event for calves. Various management practices have been suggested to reduce weaning stress. The purpose of this study was to evaluate three different weaning management practices on calf gains at weaning. Eighty-eight bull and heifer calves were assigned to one of three weaning treatments at two research locations. The weaning management options were abrupt weaning, fence-line weaning, and use of a nose-flap weaning device. Calves were weighed at the start of the measurement period and then two weeks later after weaning was completed. Calves that were weaned using the nose-flap method had significantly lower gains than calves that were abruptly weaned or fence-line weaned. Bulls also gained more during this weaning period than heifers did. Generally, fence-line weaned calves have a greater gain than abruptly weaned calves, but in this study where the calves were abruptly weaned and only moved a few miles from the dams, we did not see a difference in gains during the weaning event between abrupt weaning and fence-line practices. The nose-flap device seemed to lead to a lower gain for calves during this period and more research on the device is needed before determining the best weaning management practice.

Introduction

Calves in the United States are commonly weaned from dams at around 200 days of age. Weaning is a period of high stress in calves and has been measured through things such as visual signs of stress (vocalizing and pacing), increases in physiological responses to weaning that are related to stress (cortisol, acute-phase proteins), and reductions in performance and impaired health (summarized from Bailey, 2013). A few management practices have been evaluated to reduce stress during weaning and have been found to work to reduce stress events. The method of weaning can have downstream effects on calf health and performance. Weaning method may have the greatest economic effect on the producer that is weaning and pre-conditioning calves on their operation.

Two lower-stress weaning practices are fence-line weaning and use of a nose-flap (aka nose clip).

Fence-line weaning is a practice where the calves are removed from the dams and placed into a pasture/pen that is next to the dam so that they can have still have contact through the fence, but can't nurse. Some benefits of fence-line weaning have been reported to be a lower weight loss as compared to abruptly weaned calves, calves spend more time eating, and there is less morbidity during feedlot receiving periods (Price et al., 2003; Boyles et al., 2007).

Nose-clips/flaps have also been called 2-stage weaning where calves wear a device in their nose that is designed to be a physical barrier to nursing (Figure 1). The first phase of this process is the calves wearing this device for 14 days while being on the dam and then removal of the device in phase 2 when calves are completely removed from the dam. In a study by Haley et al. (2005) they found that following separation in phase 2, calves have 97% less vocalization and spent 79% less time walking than abruptly weaned calves.

Each of these lower stress management practices require more labor, land, and/or costs than just removing the calf from the dam. Thus a comprehensive evaluation of all the factors that go into the different management practices need to evaluated for your management system. For fence-line weaning, a good fence between the dams and calves is a must. The calves will be "gathered" twice before being moved into a pre-conditioning program or being sent to a sale barn. Nose-flaps would be purchased, then calves that will be weaned with the nose-flaps will be gathered twice (once to put in the flap, once to take it out).

The purpose of this study was to evaluate the weight gains when comparing abrupt weaning, fence-line weaning, and the use of a nose-flap device.

Experimental Procedures

Eighty-eight bull and heifer calves were used in this project (average starting weight 407 ± 54 pounds, weaning age range 130–197 days of age). The calves were from two herds at the Kansas State University Southeast Research and Extension Center. The herd at Parsons included the younger cows (1st through 4th parity) and there were 44 pairs at the Parsons location. The herd at Mound Valley included the older cows (5th parity through 9th parity cows) and there were 44 pairs at this location. Calves at each location were assigned to one of three weaning treatments: abrupt, fence-line, or nose-flap. Calves were stratified to treatments based on birthdate and sex so that each treatment group was fairly equal at both locations. There was one pasture/pen of each treatment at each location.

At Parsons, calves were weighed on March 17, 2020. The abruptly weaned calves were moved to a drylot pen (hauled 0.19 miles) where they were provided free-choice prairie hay and fed 3 pounds of dried distillers grains (DDG) per day. Calves assigned to the nose-flap treatment had nose-flaps inserted on March 17, 2020. Then those dams and calves were placed back on fescue pasture with free-choice prairie hay and each dam was offered 5 pounds of DDG and each calf were fed 3 pounds of DDG per day. Cows and calves were fed from one line of bunks and each had to compete for feed resources. Calves on the fence-line weaned treatment were weighed and then placed into a brome pasture (5 acres) that was next to the fescue pasture where their dams were placed. The calves in the fence-line treatment were provided free-choice prairie hay and 3 pounds of DDG per day.

Calves at the Mound Valley location were weighed at the start of the weaning period on March 18, 2020. Calves in drylot were provided free-choice fescue hay and 3 pounds of DDG. Fence-line calves were placed into a drylot pen that was next to the fescue pasture where their dams were grazing with calves receiving 3 pounds DDG/head/

day with free-choice fescue hay. Nose-flap calves were placed on a fescue pasture with their dams and provided free-choice fescue hay, and dams were fed 5 pounds of DDG/head/d and calves were fed 3 pounds DDG/head/d.

All calves were weighed 14 days after the weaning treatments occurred. At this time nose-flaps were removed. After the 14-day weaning period all calves were commingled until assigned to other research projects.

Data were analyzed for average daily gain differences based on weaning treatment, sex of calf, and the interaction. Gains were not different based on locations ($P = 0.30$) so location was used as a replication.

Results and Discussion

For the 14 days after weaning, overall the calves in this study gained weight. There were differences in average daily gain (ADG) based on weaning method. Calves that were abruptly weaned and fence-line weaned had significantly greater gain than those that had nose-flaps ($P < 0.001$). Fence-line weaned calves averaged 2.32 ± 0.23 pounds per day, abruptly weaned calves averaged 1.84 ± 0.21 pounds per day, and nose-flap calves only gained 0.16 ± 0.16 pounds per day. A greater number of calves on the nose-flap treatment lost weight during that 14-day period than with any other weaning method. Interestingly, more than half of the nose-flaps fell out of the noses of the calves before the 14-day period. Even though these calves could go back to nursing, they still gained the least over the 14-day observation period. Potentially, these calves only needed to wear the device for a short period to lead to weaning and they didn't nurse. An unknown source of stress may have led these calves to gain less than the other treatment groups. A third possible explanation is a competition effect for the DDG that were fed to cattle in the nose-flap treatment. Even though the calves were supplied the same amount of DDG as other treatments (3 pounds DDG/head/day) and the dams were each offered 5 pounds of DDG/day, they were all fed in one location in a long line of feed bunks. Potentially these calves consumed less DDG than other treatments as the dams might have consumed the feed faster or were just more aggressive, thus resulting in a lower gain for calves. Our results mirrored those by Boland et al. (2008) where nose-clip weaned calves had lower body weight gain than abruptly weaned and fence-line weaned calves, despite the lower measures of stress for calves with nose-clips (from blood analysis).

Bulls also gained on average, 0.60 pounds/day more than their female counterparts. In general, male cattle do gain more than female cattle. The genetics pool is very narrow within this herd of cows, so the results do not seem to be an effect of sires (50% of the calves were from one bull, 20% from another bull, and 30% from a third sire).

There was a tendency for an effect from the weaning method by sex of calf ($P = 0.11$; Figure 2). Fence-line weaned bull calves had the greatest ADG; abruptly weaned steers and heifers, and fence-line weaned heifers had intermediate gains; and regardless of sex, the nose-flap calves had the lowest ADG. There was a low number of replications within this demonstration, so this difference where bulls do better with fence-line weaning as compared to heifers, could just be an abnormal occurrence.

Conclusions

Utilizing this small sample size of calves, fence-line weaning and abrupt weaning with a very small travel distance resulted in similar calf gains during a 14-day weaning period. During the nose-flap wearing period the calves gained less than with other weaning methods. If a producer retains cattle on their own operation for a 60-day preconditioning period, our observations showed no difference in fence-line weaning as compared to abrupt weaning with a very small travel distance. The nose-flap procedure did not work well at the research station as the calves gained less and we observed a fairly low retention of the nose-flaps. For producers utilizing nose-flaps and still wanting to "bunk-break" calves by offering a supplement fed in a bunk, providing a creep-access might be the method to keep a similar rate of gain as that observed with the fence-line weaned and abruptly weaned calves.

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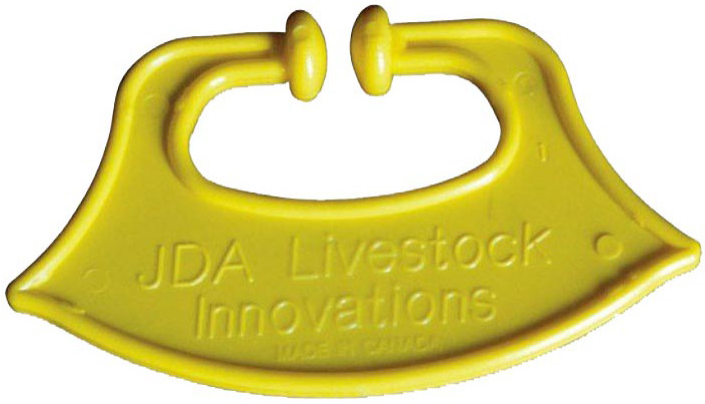

Figure 1. QuietWean nose-flap that was used in nose-flap treatment. Photo from QuietWean.com.

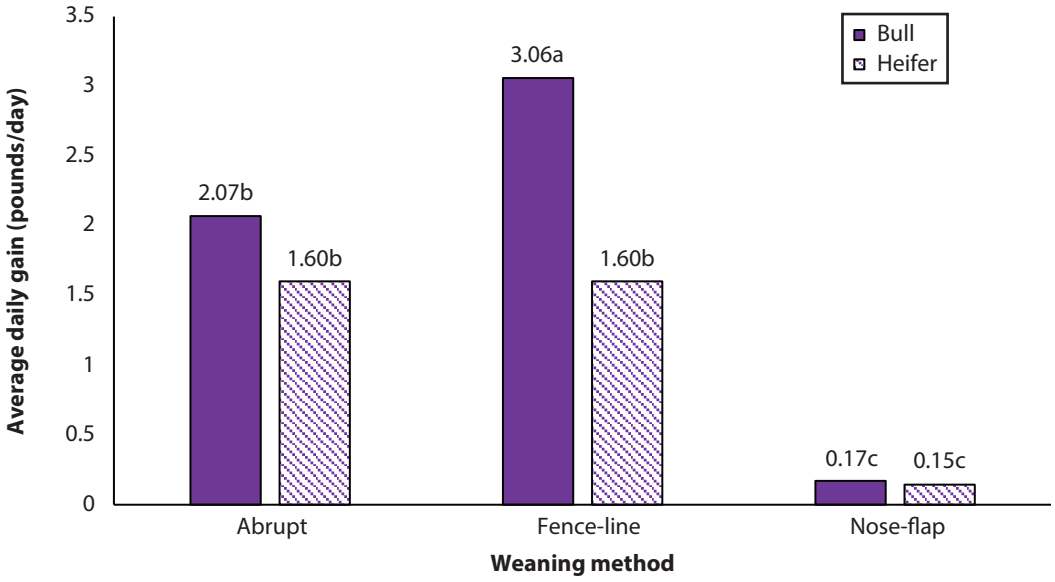

Figure 2. Average daily gain for each weaning method by sex of calf.
[abc] Different letters indicated difference at $P < 0.05$.