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Comparison of Banding and Knife Cut Castration Methods in Beef Cattle

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Castration of male calves is a common practice in modern agriculture. Castration decreases many of the management problems related to the aggressive and sexual behavior that bull calves often exhibit. Two prevalent castration techniques, banding and knife-cut, are examined in this study. While cutting has its benefits, banding appears to be a much easier procedure to perform. Studies (Gordon, 1999) have found that bulls typically gain weight fifteen percent faster than steers, because of higher testosterone levels. It has also been reported that when banding was done properly, it was easier to perform and less stressful on calves than cutting. The band on the scrotum sac tended to generate a more localized immune response than the surgical castration.

Cattle Description and Treatment Management. Data were collected on 80 male calves born at the San Juan Basin Research Center (SJBRC) in Hesperus, CO in the Spring of 2000. Breeds included Hereford, Polled Hereford, System 1 composite and Charolais cross. One-half of the calves were knife cut while the other half were banded using the Callicrate Bander. Calves were randomly assigned to a treatment group across breed and age prior to weaning.

Calves were weaned and castrated at approximately 7 months of age on October 3, 2000. Post weaning weights were recorded on October 17th and 31st to determine 2 and 4 week post castration gains. Temperatures were taken on calves that gained less than 5 pounds and if warranted, calves were given 20 cc of LA200. One half of the calves in each treatment group were sent to Kraft Feedlot in Fort Collins, CO in early November. The remaining calves continue to be backgrounded at SJBRC. Feedlot and carcass data will be collected on these steers and analyzed accordingly.

Statistical Analysis. The General Linear Models analysis of variances procedure of SAS (1996) was used in the analysis of independent variables which included treatment, and grouped age of dam (2, 3, 4, 5-9 and 10+). Age was also included as a regression coefficient. Least squares means, regression coefficients and partial correlations were taken from this analysis. Traits analyzed included actual weaning weight (ACTWW), 10/17 Weight (WT 1), 0-2 week gain (GN 1), 10/31 weight (WT 2), 2-4 week gain (GN 2) and total gain (TOTGN).

RESULTS AND APPLICATION

Impact of Treatment on Weight and Gains. Least squares means for the two treatments (banded and knife cut) are presented in Table 1. It shows that at weaning the banded calves had a 10 pound advantage. Calves were randomly assigned to their treatment groups prior to this weight. While, this initial difference was not significant, treatment was significant for WT1. At WT 1 the banded calves weighed 19 pounds more than the cut calves. At this 2-week post castration weight, none of the banded calves were found to have elevated temperatures while 7 of the cut calves were treated with LA 200.

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At 4-weeks post weaning, the weights between the two groups were no longer significant and the difference had fallen to 7 pounds. Health records taken at this weight show that 11 of the banded calves were treated with LA 200 while only 2 of the cut calves were treated. The results of this study indicate that banded calves weighed significantly more at two weeks post weaning. This could be attributed to a higher incidence of infection found in the cut calves that could have suppressed their weight. However, by the second weight, more infections were found in the banded calves and the cut calves were "catching up" in weight.

While the banded calves gained more weight during the first 2 weeks, the difference was not significant. However, the gain differences that occurred between WT1 and WT2 were highly significant. Knife cut calves gained 11.2 pounds more than the banded calves during this period. The total gain difference of 19.8 for banded calves and 22 pounds for knife cut calves was not significant.

Impact of Age of Dam (AOD) on Weight and Gains. Since weights and gains were not adjusted in this analyses, AOD was highly significant for all weight traits (Table 1). All weights from calves from 2 and 3-year olds were consistently lower than those of the 4 and 5-9 group. Additionally, weights from calves whose dams were over 10 years of age were also lower than the peak production of the 4 and 5-9 group. These results are consistent with studies looking at the affects of age of dam on weaning weight. (Linton, 1968). While, age of dam did not have a significant effect on either post-weaning gain period, we did see a trend for the calves out of 10+ dams to gain less during the first two weeks after weaning.

Impact of Age on Weight and Gains. Table 2 shows the regression coefficients found in this study. Results indicate that for each day older a calf was at weaning, it weighed an additional 1.74 pounds. While age was significant for both post-weaning weights, the magnitude remained very similar to what we saw at weaning. This supports the results showing that post-weaning gain was not affected by age of calf in this study.

Partial Correlations. Table 3 shows the partial correlations between all the weights and gains from this study. The relationship between actual weaning weight and both post weaning weights was very strong and positive (.91). These significant correlations indicate that higher weaning weights resulted in higher post weaning weights at both 2 and 4 weeks. Actual weaning weight had little to no correlation to gain in this study.

WT 1 had a significant and slightly positive (.38) correlation with GN 1 and TOTGN but no correlation with GN 2. Additionally, GN 1 had a slightly positive (.31) correlation with WT 2 and a slightly negative (-.22) correlation with GN 2. These results indicate that those calves that gained more during the first period weighed more at the second weight but gained less during the second period.

DISCUSSION AND SUMMARY

Results from this study indicate that banded calves have an initial advantage 2-weeks post weaning over the knife cut calves. However, by WT2, the banded and knife cut calves weights were no longer significantly different. Cut calves "caught up" to the banded calves in total weight.

There was no significant difference between the banded and cut calves during GN 1. However, there was a difference in GN 2 between the banded and cut calves.

Costs associated with each method of castration can be divided into direct and indirect costs. Direct costs associated with banding include $1.97 per band versus a nominal cost for scalpels with the knife cut method. Indirect costs include both labor and herd health costs. An experienced bander can place the band on a calf in approximately 1.5 minutes while the knife cut castration takes at least 4.5 minutes. This results in a 3 minute per calf time savings. With 100 calves, this would equate to a 300 minute (5 hour) reduction in processing time. Additional indirect costs for health care include $2.00 for each 20cc shot of LA 200 that was administered.

In future studies, we will record body temperature on all calves at both the 2 and 4 week post weaning weights. This will reduce bias related to health records and weight gain. By doing so, we will be able to further analyze the incidence of infection in both the banded and cut calves.

LITERATURE CITED

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