2019

The Effect of Cow Udder Score on Subsequent Calf Performance in the Nebraska Sandhills

Joslyn K. Beard
University of Nebraska - Lincoln, jbeard@unl.edu

Jacki A. Musgrave
University of Nebraska–Lincoln, jacki.musgrave@unl.edu

Rick N. Funston Funston
University of Nebraska–Lincoln, rick.funston@unl.edu

J. Travis Mulliniks
University of Nebraska - Lincoln, travis.mulliniks@unl.edu

The Effect of Cow Udder Score on Subsequent Calf Performance in the Nebraska Sandhills

Joslyn K. Beard
Jacki A. Musgrave
Rick N. Funston
J. Travis Mulliniks

Summary with Implications

Cow records were evaluated over a 5-yr period to investigate how cow udder score affected calf growth and carcass performance. Cows from 2 calving herds, March and May, were classified as bad or good based on udder scores recorded at calving. Calves suckling dams with bad udders performed similarly during the pre-weaning period to good udder counterparts, with no differences in overall steer feedlot performance between udder groups. However, steers suckling good udder cows had heavier carcass weights and greater back fat thickness.

Introduction

Selection pressure for increased production has caused producers to remove cows from their herd for reproductive failure, structural issues, poor health, and disease. Producers emphasize improved growth by selecting genetically superior animals through increased milk yield and calf growth. However, beef cows with poor udder conformation may decrease production through decreased calf body weight at weaning and increased labor costs. Research has shown defects in teat shape and size inhibits nursing ability thus negatively impacting calf intake and gain. Contradictory findings have reported calves suckling dams with just one functional teat have similar growth performance in comparison with calves suckling dams with all functional teats. Thus, it was hypothesized cows classified with poor udders would produce calves with similar pre- and post-weaning growth. The objective of this study was to evaluate the effect of beef cow udder score within March and May calving seasons on pre- and post-weaning progeny performance.

Table 1. Effect of cow udder score on calf growth from birth to weaning

	Treatments[1]			
Item	BU	GU	SEM	*P*-value
Birth BW (lb)	71	71	1.11	0.95
Weaning BW(lb)	451	446	7	0.40
Adj. 205 d BW(lb)	340	345	7	0.28

[1]Treatments are BU (udder score of 1 or 2) and GU (udder score of 3 or 4).

Procedure

Cow and calf performance data on 812 cows were collected from 2013 through 2017 at the Gudmundsen Sandhills Laboratory (Whitman, NE). Cow and subsequent calf performance were obtained from the March (n = 500) and May (n = 312) calving herds at Gudmundsen Sandhills Laboratory. Each year at calving, udder scores were recorded from a 1 (bad) to 5 (good) as reported in the Integrated Resource Management Guide (National Cattlemen's Beef Association, 2013). The udder score combines udder conformation and a teat score system. Cows were grouped by udder scores and classified as either BU (bad udder score 1 or 2, n = 223) or GU (good udder score 3 or greater, n = 1,742). Calf data were stratified by cow udder score, calving season, and year.

Calves were vaccinated at 2 mo of age with an infectious bovine rhinotracheitis, parainfluenza-3 virus, bovine respiratory syncytial virus, and bovine viral diarrhea type I and II vaccine (BoviShield 5, Zoetis, Florham Park, NJ). Calves were also weighed, branded, and male calves were castrated. Cow-calf pairs grazed native upland range pastures. At weaning, calves were weighed and vaccinated against bovine rotavirus-coronavirus clostridium perfringens type C and D and Escherichia (Bovine Rota-Coronavirus Vaccine, Zoetis, Florham Park, NJ). After weaning, March-born steers were placed in a drylot and consumed ad libitum hay for 2 wk, transported to the West Central Research and Extension Center (WCREC), and fed as a group in drylot pens.

After weaning, May-born steers grazed subirrigated meadow with 1.0 lb supplement or received ad libitum hay with 4.0 lb supplement until approximately 1 yr of age then relocated to WCREC. Steers were placed in a GrowSafe feeding system approximately 2 weeks after arrival at WCREC. Following a 10-d acclimation period in the GrowSafe, steers were weighed 2 consecutive d and the average was the initial feedlot entry BW used in calculating feedlot performance. All steers experienced a 21 d transition period to a common finishing diet of 48% dry rolled corn, 40% corn gluten feed, 7% prairie hay, and 5% supplement. All steers were implanted with 14 mg estradiol benzonate and 100 mg trenbolone acetate (Synovex Choice, Zoetis) at feedlot entry. Approximately 100 d before slaughter, calves were implanted with 28 mg estradiol benzoate and 200 mg trenbolone acetate (Synovex Plus, Zoetis). Each year, steers were slaughtered at a commercial facility (Tyson Fresh Meats, Lexington, NE) when estimated visually to have 1.3 cm fat thickness over the 12^{th} rib. Carcass data were collected 24 h post slaughter and final BW was calculated from HCW based on an average dressing percentage of 63%. Carcass data included HCW, marbling, yield grade, backfat, and LM area.

Data were analyzed using the PROC MIXED and GLIMMIX procedures of SAS (SAS Inst. Inc., Cary, NC). A mixed model ANOVA accounted for correlations within udder score and udder score within calving season. Models included the effect of treatment, cow age, calving season, and calf sex for all appropriate data. Data are presented as LSMEANS and P-values ≤ 0.05 were considered significant and tendencies were considered at a $P > 0.05$ and $P \leq 0.10$.

Results

There were no interactions between calving seasons or year, therefore the main effect of udder score is reported. Calf BW at birth, weaning, and adjusted 205-d BW is reported in Table 1. Influence of sex was not significant in any of the parameters ($P \geq 0.10$), thus, heifer and steer data were pooled together in all pre-weaning variables. Calf BW at birth was similar between udder score groups ($P = 0.95$), along with calf weaning BW ($P = 0.40$) and adjusted 205-d BW ($P = 0.28$). Steer feedlot performance is reported in Table 2. Steers from bad udder (BU) and good udder (GU) dams had similar feedlot entry BW ($P = 0.41$), final feedlot BW ($P = 0.30$), DMI ($P = 0.54$), ADG ($P = 0.60$), and F:G ($P = 0.71$). Carcass performance is reported in Table 3. Calves suckling GU dams had greater HCW ($P = 0.04$) and backfat ($P = 0.02$) compared with BU counterparts. Although feedlot entry and final BW were similar for steers from GU and BU dams, they were numerically greater for steers from GU dams, which may have increased HCW.

Conclusion

Though udder score doesn't have a large impact on pre-weaning calf growth performance, an advantage of carcass weight in calves born to GU cows suggests a positive impact on processing yield for consumer products. Further research is required to define how udder score affects female progeny and how calving season influences the total proportion of BU cows.

Joslyn K Beard, graduate student

Jacki A. Musgrave, research technician

Rick N. Funston, professor, Animal Science

J. Travis Mulliniks, assistant professor, Animal Science, West Central Research and Extension Center, North Platte

Table 2. Effect of cow udder score on steer feedlot performance

	Treatments[1]			
Item	BU	GU	SEM	P-value
Entry BW (lb)	595	610	18	0.41
Final BW (lb)	1,364	1,388	22	0.30
DMI (lb/d)	27.6	27.2	0.55	0.53
ADG (lb)	3.69	3.76	0.07	0.60
F:G	7.13	7.24	0.31	0.71

[1]Treatments are BU (udder score of 1 or 2) and GU (udder score of 3 or 4).

Table 3. Effect of cow udder score on calf carcass traits

	Treatments[1]			
Item	BU	GU	SEM	P-value
HCW (lb)	829	860	15	0.04
Yield Grade	2.3	2.7	0.20	0.10
LM area (in^2)	13.9	14.1	0.29	0.63
Marbling Score[2]	454.5	461.2	23.2	0.85
Backfat (in)	0.50	0.57	0.03	0.02

[1]Treatments are BU (udder score of 1 or 2) and GU (udder score of 3 or greater).

[2]Marbling score: 400 = $Small^{00}$, 450 = $Small^{50}$, 500 = $Modest^{00}$