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Influence of feeding practices and season of birth on calf performance

Abstract

The ability of beef cows to produce heavy, vigorous and good quality calves every year is one of their most important economic traits. Feeding practices have been reported to influence average daily gain (ADG) and weaning weight. We evaluated creep-feeding, noncreep-feeding, season of birth, and other factors that affect preweaning performance of calves. At the Fort Hays Branch Experiment Station, Hays, Kansas, purebred sires had been used many generations in the grade Hereford herd. Calves, born in both spring and fall, were randomly allotted to creep-fed and noncreep-fed groups every year. Cows and calves grazed native pastures.

Keywords

Cattlemen's Day, 1969; Report of progress (Kansas State University. Agricultural Experiment Station); 529; Beef; Feed; Birth season; Calf performance; Average daily gain

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Influence of Feeding Practices and Season of Birth on Calf Performance

A.R. Singh, R.R. Schalles, W.H. Smith and F.B. Kessler

The ability of beef cows to produce heavy, vigorous and good quality calves every year is one of their most important economic traits. Feeding practices have been reported to influence average daily gain (ADG) and weaning weight. We evaluated creep-feeding, noncreep-feeding, season of birth, and other factors that affect preweaning performance of calves.

At the Fort Hays Branch Experiment Station, Hays, Kansas, purebred sires had been used many generations in the grade Hereford herd. Calves, born in both spring and fall, were randomly allotted to creep-fed and noncreep-fed groups every year. Cows and calves grazed native pastures.

All calves were weighed and identified within 24 hours after birth and were again weighed at weaning. Weaning date varied from September 15 to November 1 for spring calves and July 1 to July 15 for fall calves. Their average age at weaning was 232 days. Birth weight, preweaning ADG, and weaning weight were available for 433 calves from 8 sires during 4 years.

The data were analyzed by least squares method, using a multiple classification model with regressions and interactions with unequal subclass numbers. Standard errors were calculated and the "t-test" was used to isolate differences among subclasses.

Results and Discussion

Effects of various factors are shown in Tables 5 and 6 . Average birth weight, preweaning ADG and weaning weight were 74.6, 1.90, and 515.0 pounds, respectively.

Feeding practices (creep-feeding versus noncreep-feeding) did not significantly affect preweaning ADG or weaning weight. Creep-fed calves had 0.03 pound advantage in preweaning ADG and were only 4.38 pounds heavier at weaning than noncreep-fed calves. Perhaps creep-feeding would be justified by cows producing less milk. Here nutrient demands of noncreep-fed calves apparently were met.

Season significantly affected birth weight but not preweaning ADG or weaning weight. Spring-born calves were 2.4 pounds heavier at birth, grew 0.04 pound per day faster and were 12.0 pounds heavier at weaning than calves born during fall. But only birth weights were significantly different.

Interaction between feeding practices and season was highly significant. Contrary to the most previous reports, creep-feeding had greater effect on calves born in spring than those born in fall. Creep-fed calves born in spring weighed 27.6 pounds more at weaning than creep-fed calves born in the fall.

Sires significantly influenced all traits studied. Greatest differences among sire groups in birth weight, preweaning ADG, and weaning weight of calves were 8.5, 0.09, and 22.0 pounds, respectively.

Years did not significantly influence birth weight, but did significantly influence preweaning ADG and weaning weight. The fourth year was best; the first year poorest for preweaning ADG and weaning weight. The preweaning ADG and weaning weight differed 0.22 and 50.5 pound, respectively, between 1st and 4th years.

Sex of calf significantly influenced ($P<.01$) all performance traits studied. Bulls were 4.64 pounds heavier than heifers at birth. Steers gained 0.11 pound per day faster and were 24.6 pounds heavier at weaning. Male calves were heavier at birth and maintained the advantage to weaning.

Age of dam did not significantly influence any performance trait studied. Birth weight of calves tended to increase with age of dams. Calf preweaning ADG and weaning weight were lowest for 8 to 12-year-old cows and highest for 4-year-old cows. Calves from 4-year-old cows grew 0.04 pound per day faster and were 10.63 pounds heavier at weaning than the average. Variation in calves' growth rate, normally associated with age of dam, could result largely from differences in dams' milk production.

Age of calf had no significant influence on preweaning ADG, but was significantly associated with weaning weight. The regressions of preweaning ADG and weaning weight on age of calf were 0.0001 and 1.91, respectively, indicating that weaning weight of calves increased an average of 1.91 pounds per day.

Birth weight significantly influenced preweaning ADG and weaning weight. Regression coefficients indicated a 0.01 pound per day advantage in preweaning ADG and 3.34 pounds in weaning weight of calves for each 1 pound advantage in birth weight.

Therefore, this study suggests that creep-feeding was probably not an economical feed practice for beef calves. In this study, it was more useful for spring calves than fall calves, which is completely opposite to the results of most of the previous researchers. Spring calves were a non-significant 12 pounds heavier than fall calves.

Table 5

Least Squares Effects of Management, Season of Birth, and Year on Performance of Hereford Calves

Effects studied	No. of calves	Birth weight lbs.	Av. daily gain lbs.	Weaning weight lbs.
General means	433	74.60 ± 0.36	1.90 ± .011	515.0 ± 3.72
Management				
Noncreep fed	228	-	-0.017 ± .001	-2.19 ± 0.13
Creep-fed	205	-	0.017 ± .001	2.19 ± 0.22
Season of birth				
Spring	326	1.20 ± 0.10	0.022 ± .017	5.92 ± 3.98
Fall	107	-1.20 ± 0.39	-0.022 ± .020	-5.92 ± 4.49
Years				
1	117	-0.97 ± 0.66	-0.082 ± .013	-20.93 ± 2.84
2	133	0.70 ± 0.25	-0.20 ± .000	-2.29 ± 0.01
3	129	0.75 ± 0.25	-0.035 ± .001	-6.39 ± 0.04
4	54	-0.48 ± 0.89	0.137 ± .005	29.61 ± 1.13

Table 6

Least Squares Effects of Sex, Age, Birth Weight of Calf and Age of Dam on Performance of Calves

Effects studied	No. of calves	Birth weight lbs.	Av. daily gain lbs.	Weaning weight lbs.
General means	433	74.60 ± 0.36	1.90 ± 0.01	515.0 ± 3.72
Sex				
Heifers	189	-2.32 ± 0.11	-0.055 ± .002	-12.28 ± 0.46
Steers	244	2.32 ± 0.08	0.055 ± .003	12.28 ± 0.58
Age of dam, yrs.				
3	59	-1.40 ± 0.51	-0.003 ± .000	-0.31 ± 0.05
4	78	0.07 ± 0.38	0.041 ± .000	10.63 ± 0.07
5-7	145	0.64 ± 0.26	-0.016 ± .003	-3.77 ± 0.55
8-12	151	0.69 ± 0.28	-0.023 ± .002	-6.55 ± 0.44
Age of calf[a]	433	-	b = 0.0001	b = 1.91
Birth weight[a]	433	-	b = 0.01	b = 3.34

[a] Reported as regression coefficients.