

jecting cattle with vitamin E at two times during the feeding trial. It is possible that vitamin E could exert a beneficial influence on feed efficiency, which could not be measured in this trial. It is also possible that in other situations with different feedstuffs, supplemental vitamin E might be of some value if the ration is deficient in vitamin E. Deficiencies of vitamin E in feedlot cattle do not appear to be widespread, however.

Early Weaning vs. Normal Weaning vs. Creep Feeding of Heifer Calves

Robert Totusek

Story in Brief

Angus and Hereford heifer calves were subjected to (1) low, (2) medium, and (3) high planes of nutrition previous to weaning by (1) weaning at 140 days, (2) weaning at 240 days, and (3) creep feeding and weaning at 240 days, resulting in over 100 lb. spread in weight at 240 days of age. Compared to normal weaning, early weaning has resulted in a slight decrease in weight to 4 years of age, no permanent affect on appearance and skeletal size, and an increase in productivity based on the weaning weight of calves produced, while creep feeding has resulted in no permanent advantage in body size and no advantage in productivity.

Introduction

Since feeder calves represent an important source of agricultural income in Oklahoma, the development of the beef female for maximum productivity (milk production) and reproductive performance is of obvious importance. Milk production and reproductive performance can be markedly influenced by both undernutrition and overnutrition during the postweaning period of development. The harmful effects of severe undernutrition during the growth period on milk production of the beef female have been recognized for many years. More recently the possible detrimental influence of a high plane of nutrition during the postwean-

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ing developmental period on the ultimate milk producing ability of both beef and dairy cows has been reported. Similarly, it has been shown that a low plane of nutrition results in inferior reproductive performance, and that a high plane of nutrition may also result in suboptimum reproduction. Much of the research with beef cattle has been conducted at this station and reported in Feeder's Day Reports during the past 18 years.

Observations at this station have indicated a tendency for heifers with the lowest preweaning gains to develop into the best milk producers, and for heavy milking cows to produce heifer calves with lowered milk producing ability. These limited observations suggested that preweaning plane of nutrition does influence the subsequent performance of beef females. Since no controlled research on this problem had been reported, an experiment was initiated to determine the influence of preweaning plane of nutrition of heifer calves on (1) body development, (2) milk production, and (3) reproductive performance.

Procedure

The experiment is being conducted under range conditions at the Lake Carl Blackwell Range near Stillwater, and includes both Angus and Herefords. Within each breed, three preweaning planes of nutrition were imposed on heifer calves. A low plane was accomplished by weaning heifers at 140 days of age, then maintaining a gain of approximately .75 lb. per day to an age of 240 days with a ration of either alfalfa hay or prairie hay plus a protein supplement. A medium plane was obtained by weaning the heifers at 240 days. A high plane was induced by creep feeding during the suckling period and weaning at 240 days of age.

All heifers within each breed produced in the same year were kept together after the age of 240 days. They were wintered in a trap, on alfalfa hay or prairie hay and protein supplement, at a moderate level of nutrition. After reaching 1 year of age, the heifers were allowed to graze native pasture, supplemented with protein concentrate or alfalfa hay during the winter. All heifers of the same breed born the same year were bred to the same bull, and were bred to calve first at 2 years of age.

Results and Discussion

Although numbers are still limited, and insufficient to allow definite conclusions relative to many questions, some trends have become apparent and the preliminary data are being reported.

Figure 1 illustrates weight changes to 4 years of age as influenced by preweaning plane of nutrition. At 240 days of age normal weaned and

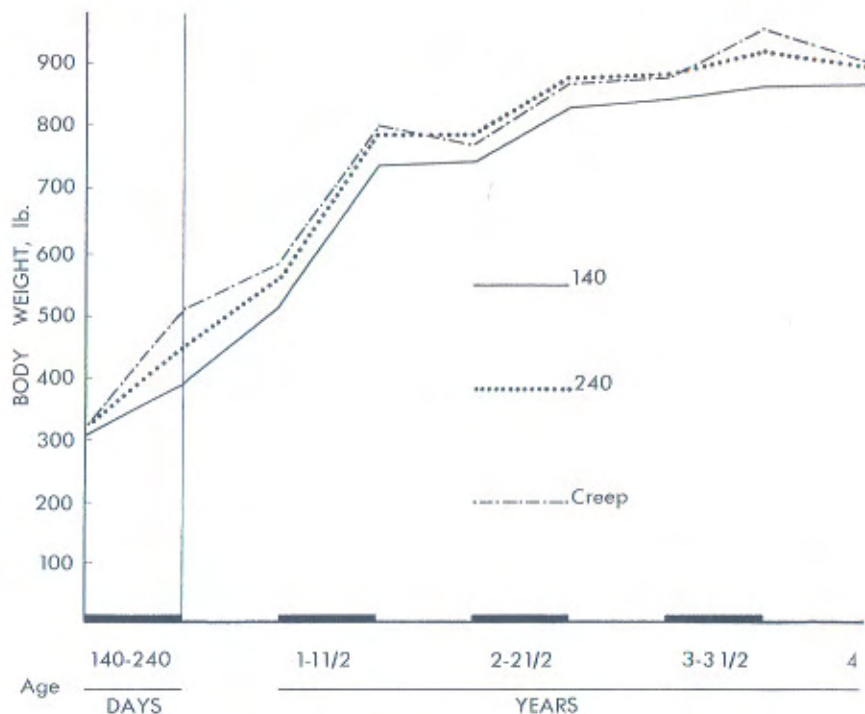


Figure 1. Body weight is influenced by three pre-weaning planes of nutrition.

creep fed heifers weighed 51 and 117 lb. more than early weaned heifers. The early weaned heifers have remained slightly lighter in weight (about 40 lb.) to 4 years of age than the other heifers. Perhaps this difference in size as measured by weight will be permanent. However, creep fed heifers have not maintained their advantage in weight over the normal weaned heifers, indicating that their weight advantage at 240 days was largely fat rather than skeletal and muscle tissue.

The actual appearance of the heifers is rather accurately reflected by condition score, shown in Figure 2. There was a great difference in appearance at 240 days of age. The early weaned heifers were thin and appeared rather frail. The creep fed heifers were big and thick and bloomy, and suggested potential for developing into large productive cows. The normal weaned heifers were intermediate in appearance. Differences in appearance were less apparent at 1 and 1½ years of age, and after the age of 2 years it has been difficult to identify the heifers ac-

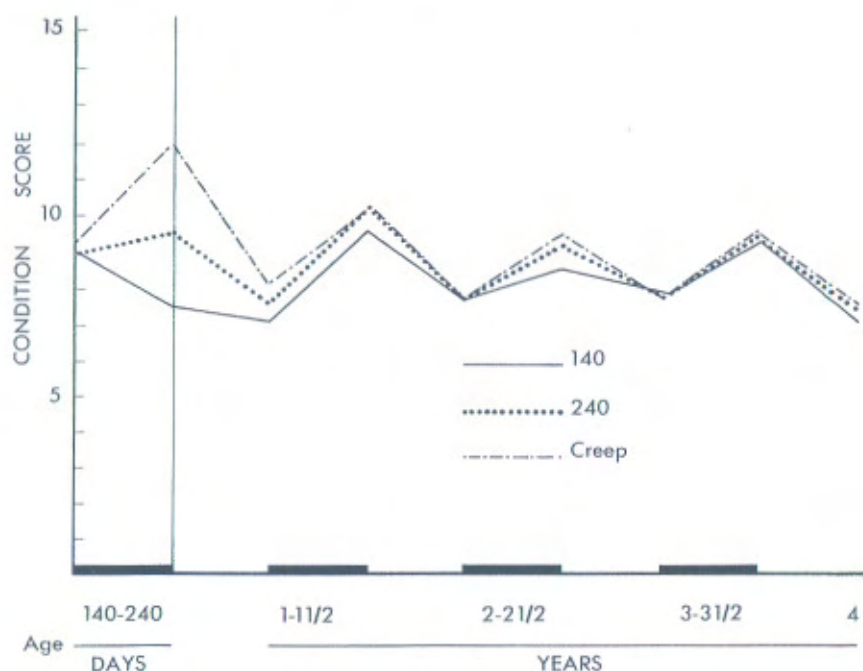


Figure 2. Body condition score as influenced by three pre-weaning planes of nutrition.

ording to preweaning treatment, even when they are sorted into their treatment groups.

Changes in skeletal size as indicated by height at withers are illustrated in Figure 3. Skeletal size was affected less by preweaning plane of nutrition than was weight. Differences in wither height between early weaned and creep fed heifers did approach 2 in. at 240 days of age, but these differences disappeared by 2 years of age.

Cow productivity as affected by preweaning plane of nutrition is summarized in Table 1. About one-half of the data is for first-calf cows, one-third for second-calf cows, and only one-sixth for third-calf cows.

There was little difference in calving date, indicating that conception date was not greatly affected by preweaning plane of nutrition. There was also very little difference in birth weight of calves due to preweaning treatment of the cows. Conception rate, as indicated by per-

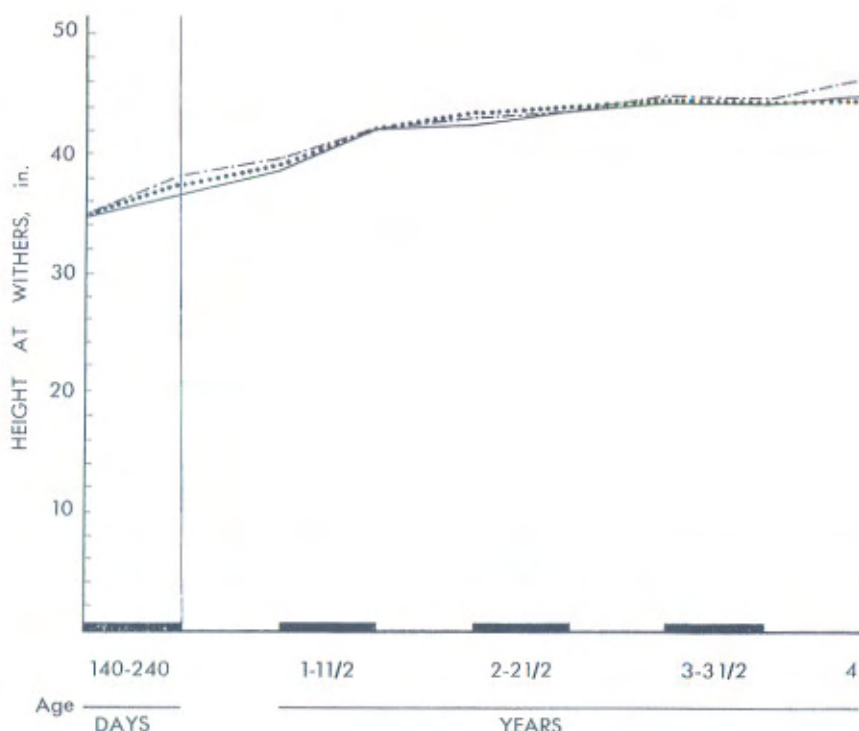


Figure 3. Height at withers is influenced by three pre-weaning planes of nutrition.

centage of cow calving, has tended to be higher for the cows which were creep fed as heifers, although this advantage has decreased by weaning time due to slightly greater losses at and following calving. More data is definitely needed to justify conclusive statements in this regard.

Early weaned heifers have produced heavier calves than either of the other two groups. Creep fed heifers have produced calves only very slightly lighter than normal weaned heifers. The advantage in weaning weight of calves produced by the early weaned heifers has averaged 15 to 20 lb. over the normal weaned heifers, and 19 to 24 lb. over the creep fed heifers.

The preliminary data presented here suggest that a high plane of nutrition of heifers previous to weaning has little permanent advantage in terms of body size and productivity, while a low plane of nutrition has a slight depressing affect on body size but improves productivity in terms of weaning weight of calves produced.

Table 1. Effect of Preweaning Plane of Nutrition on Cow Productivity

	Preweaning Treatment of Cows		
	Weaned at 140 days	Weaned at 240 days	Cows Creep fed, weaned at 240 days
1965 and 1966 Calves			
No. cows bred	48	49	45
Calving date	4-4	3-31	4-8
Birth wt., lb.	65	65	63
% calved	77	79	84
% weaned	71	72	75
210-day wt., lb.	402	387	383
1967 Calves			
No. cows bred	49	46	50
Calving date	3-31	3-28	3-30
Birth wt., lb.	68	69	70
% Calved	90	85	90
% Weaned	78	74	76
210-day wt., lb.	430	410	406

Performance of Beef Calves During a Three Week Pre-weaned Period

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Story in Brief

Two hundred weaner beef calves were used to observe weight change patterns during a three-week period after weaning. Steer and heifer calves consuming limited amounts of supplemental feed while being weaned on pasture averaged 30 and 13 pounds of gain, respectively, during 21 days after weaning. The possibility of important sex differences in gain immediately after weaning is suggested.

Introduction

Much interest in pre-weaning of feeder calves before they are shipped to the feedlot has occurred during the past two years. It appeared desirable to establish the weight change pattern of calves after weaning when maintained on the farm or ranch for periods up to 3 weeks prior to shipment. This test was conducted in the fall of 1967 at the Ft. Reno Research Station.