

EFFECTS OF LIMIT-FED HIGH PROTEIN CREEP FEED OR EARLY WEANING ON PERFORMANCE OF FALL-BORN CALVES AND THEIR DAMS

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Story in Brief

Twenty eight fall-calving Hereford and Hereford X Angus calves born in September and October were allotted to Control (no creep and normal weaning), Creep (1 lb/head/day of soybean meal limit fed with 10% salt from Nov. 25 to April 8, normally weaned) or Early Weaning (weaned on December 17). Calves fed salt-limited soybean meal creep gained 51 lb more by April 8 than Control calves. Creep calves consumed 124 lb of soybean meal for a conversion of 2.43 lb creep/lb added weight. Following cessation of creep feeding on April 8, gains of Control and Creep calves were similar until weaning on July 12 and during a subsequent stocker phase from weaning until October 14. Early weaned calves gained rapidly during the 28-day drylot period following weaning but gained slower than Control calves when placed on pasture with hay and supplement during the remainder of winter until weaning in July. During the postweaning stocker phase, all three groups of calves gained at similar rates. Dams of early weaned calves gained significantly more weight during winter and the following summer than dams that nursed calves. Limit-fed high protein creep appears to be an efficient method of increasing weaning weights of fall-born calves on native range. The additional weaning weight was maintained after weaning during a stocker phase. No health problems were noted for calves early weaned in winter. Early weaning of fall calves may be a feasible option when forage is limited for the cow herd or when poor reproduction is expected.

(Key Words: Early Weaning, Creep Feed, Fall Calving, Beef Cattle)

Introduction

Two problems are common with fall-calving programs where dormant forages are the primary feed resource. First, cows must be fed large amounts of supplements and/or hay to maintain weight and reproductive performance. Early weaning of calves near the beginning of breeding season could significantly reduce the feed resources needed for fall-calving cows in years when forage or supplemental feeds were expensive or scarce. Costly purchased feeds could be more efficiently utilized by the calf, and the dry cow would maintain weight on low quality roughages. However, management of early weaned calves during the winter would be critical to success in such a strategy. Secondly, even when calves are raised naturally by the cow, calf gains are low during the winter. Limit-fed high protein creep efficiently increases weaning weights when fed during late summer to spring-born calves (Lusby et al., 1985). If protein creep could stimulate forage intake and digestibility in fall-born calves during the winter, weaning weights might be efficiently increased. The objectives of this trial were to compare cow and calf performance when fall-born calves were either early weaned or

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limit-fed a high protein creep.

Materials and Methods

Twenty eight Hereford and Hereford X Angus calves and their dams were allotted by calving date and breed to three management treatments on November 25, 1984. Calves were born in September and October and grazed native range pastures with their dams. All calves were weighed and individually identified at birth and male calves were castrated by banding. The three management treatments were Control, Creep and Early Weaning. Control calves grazed with their dams and were not creep-fed until weaning on July 12, 1985. Cows were supplemented with 3 lb/day of cottonseed meal from the beginning of the breeding season (November 25 - February 1) to the onset of spring grass in mid-April. Hay was only fed when temperatures were extremely cold or when snow or ice covered forage. A second group of calves (Creep) and their dams were managed the same as Control cattle except that soybean meal was offered in a creep feeding enclosure, accessible only to calves, from November 25 to April 8. When intake of creep reached 1 lb/hd/day, salt (10%) was added to limit intake at the 1 lb level. A third group of calves (Early Wean) was early weaned from their dams on December 17. All calves were vaccinated for Blackleg (*Clostridium chauvoei* and septicum), IBR, BVD, PI-3 (IM) and Precon-Ph (*Pasteurella*) on November 25, so that immunity could have been developed before the stress of early weaning. Calves to be early weaned were offered soybean meal creep from November 25 to December 17 in order to teach the calves to eat milled feed. On December 17, Early Weaned calves were hauled 3 miles to the range headquarters where they were fed a mixed ration in a self-feeder (Table 1) for 28 days. After 28 days in drylot, early weaned calves were maintained for the rest of the winter on free-choice prairie hay and 2 lb/hd/day of soybean meal. In order to reduce labor costs, hay to early weaned calves was in the form of large round bales and soybean meal was limit-fed with salt. Hay and soybean meal were withdrawn in April when calves began eating green forage. After early weaning, dams of early weaned calves grazed dormant bermuda pasture for the remainder of the winter and were fed 1 lb/day of cottonseed meal.

From April 8 until July 12, all cows and calves grazed native range without supplement or creep feed. Control and Creep calves were weaned on July 12 and, after a 7-day bawl-out period, were grazed in a stocker

Table 1. Ration fed to early weaned calves in drylot.

Ingredient	Percent As Fed
Cottonseed hulls	30.0
Rolled corn	46.3
Cane molasses	4.0
Soybean meal	18.0
Limestone	1.9
Dicalcium phosphate	.45
Salt	.30
Vitamin A (30,000 IU/gm)	1 lb/ton
Deccox (6%)	1 lb/ton

phase on native range with Early Weaned calves until October 14. During the stocker phase, all calves received 1 lb/hd/day of soybean meal containing 100 mg/lb of Rumensin. Supplement was prorated for feeding on Monday, Wednesday and Friday.

Results and Discussion

Creep Feeding

Creep calves consumed soybean meal at the desired 1 lb/day level within 2 weeks although Creep calves gained only 10 lb more (nonsignificant) than Control calves from November 25 to January 14 (Table 2). From mid-January to mid-March, however, Creep calves gained about 20 lb/month more than Control calves. It is likely that declining milk production of the dams, which would reduce calf weight gains, combined with increased size and forage intake potential of the calves permitted Creep calves to utilize the protein creep feed to advantage.

During the period between March 11 to April 8, winter annual forages grew rapidly and gains of Control calves increased as calves were able to supplement their diet with green forage. Even though Creep calves continued to consume 1 lb/day of soybean meal, gains of creep

Table 2. Performance of control, creep-fed and early weaned calves and their dams.

Item	Control	Creep	Early Weaned	Prob.
No. cow/calf pairs	9	9	10	
Ave. calf birth date	9/22/84	9/22/84	9/19/84	
Calf birth wt, lb	66	72	64	
Initial calf wt, 11/25, lb	162	173	167	
Calf wt changes, lb:				
11/25-12/17	20.5	25.6	26.5 ^b	NS
12/17-1/14	30.0 ^a	33.3 ^a	59.5 ^b	.01
1/14-2/11	16.1 ^a	35.6 ^b	3.7 ^a	.01
2/11-3/11	17.8 ^a	38.3 ^b	19.4 ^a	.01
3/11-4/8	43.9	42.2	41.1	NS
4/8-5/6	68.3 ^a	76.7 ^a	39.5 ^b	.01
4/8-7/12	200.1 ^b	198.6 ^b	131.0 ^a	.01
7/12-10/14	135.2	131.8	134.6	NS
Cow wt, 11/25, lb	1082	1040	1074	
Cow wt change, lb				
11/25-5/6	-50.6 ^b	-25.6 ^b	+21.7 ^a	.01
5/6-7/12	122.8 ^a	115.6 ^a	152.2 ^b	.02
Cow condition score ^e	6.2	5.9	6.2	
Cows pregnant/exposed	6/9	8/9	10/10	

^{abc}Numbers on a line with like superscript letters do not differ (P<.05).

^dCreep feeding period, 11/25-4/8; Early Weaned calves in drylot, 12/17-1/14; Control and Creep treatment calves nursing with no creep 4/8-7/12; postweaning period on native range with 1 lb/day SBM containing 100 mg/lb Rumensin.

^eScale, 1=very thin - 9=very fat.

calves were similar to gains of Control calves. For the total period, Creep calves consumed 124 lb of soybean meal for a conversion of 2.43 lb creep/lb added weight.

These results suggest that protein creep is best utilized when forage quality and/or milk production of the dam are limiting calf gains. With the onset of green winter annuals in mid-March, Control calves were apparently able to consume sufficient protein and energy for increased weight gains. Creep calves were likely also consuming winter annuals and did not utilize additional protein creep for increased gain. Producers should monitor the onset of green forages in the spring and cease protein creep feeding when calves begin consuming green forage.

Gains were similar for Control and Creep calves from the cessation of creep feeding on April 8 until weaning on July 12 (200 vs 199 lb). Although Creep calves gained 51 lb more than Control calves during the winter, Creep calves were still 50 lb heavier than Control calves at weaning. Gains of Control and Creep calves were similar during the mid-July to mid-October stocker phase (135 vs 132 lb). Similar gains from the cessation of creep feeding through weaning and a stocker phase suggest that added weight from creep feeding in winter can be maintained. An important consideration in this study is that the creep calves were not excessively conditioned at the end of creep feeding but had only maintained a moderate rate of gain during the winter.

Early Weaned Calves

No sickness was observed during the 28-day drylot phase following early weaning. This was in spite of weather conditions that varied from sunshine and temperatures in the high 60's (F) to freezing rain. Immunization 3 weeks prior to weaning, which aided in developing immunity prior to weaning, no processing at the time of weaning and teaching the calves to eat by providing creep prior to weaning are all factors which should have reduced stress at early weaning. The weaning ration was palatable and intakes approached 6 lb/hd/day within 2 days after weaning. Average ration intake for the 28-day period was 8.7 lb/head/day and calves gained 2.14 lb/day. The feed conversion was 4.06 lb of feed/lb of gain, which is consistent with efficient conversions seen in previous OSU early weaning studies (Lusby and Wettemann, 1980; Lusby and Parra, 1981). High feed intake, relatively high energy in the ration and small body weight (and maintenance requirement) are all factors that make young calves potentially efficient. These results, along with previous early weaning studies at the Oklahoma Agriculture Experiment Station, show that calves can be successfully early weaned at about 2 months of age with minimal health problems when planning emphasizes reduction of stress.

Early Weaned calves gained only 4 lb (Table 2) during the first 28 days when they were moved from drylot to native pasture and fed 2 lb/hd/day of soybean meal. Calves were not maintained in drylot on a high concentrate ration to normal weaning age because it is not economical due to the labor and feed needed in a drylot program. Raising the Early Weaned calves to normal weaning age with prairie hay and protein supplement represented a relatively low cost and low labor program. From 10 to 20% salt was needed to limit intake in the soybean meal to 2 lb/day. Gains of Early Weaned calves and Control calves were similar from mid-February to mid-April when gains of Control calves were also quite low. Weight gains for Early Weaned calves were significantly lower than gains for Control calves from mid-April to normal weaning time in July (200 vs 131 lb). The reason for the failure of Early

Weaned calves to make compensatory gains during the spring and early summer months when forage quality is high is not known. Gains were identical for Control and Early Weaned calves during the postweaning stocker phase (135 lb).

Cow Performance

As expected, dams of early weaned calves gained significantly more weight during the winter than dams that nursed Control or Creep calves. Early Weaned cows were wintered on pastures with lower quality and quantity of forage and fed one-third the daily protein supplement of cows that nursed calves. All cows with early weaned calves were pregnant following the breeding season compared to 8 of 9 cows with creep calves and 6 of 9 Control cows. Although cow numbers are too small to compare reproductive performance among the 3 groups of cows, the high conception rate for cows with Early Weaned calves is consistent with high reproductive performance when calves are early weaned. During the period from mid-April to normal weaning in July, cows with early weaned calves continued to gain faster than cows nursing calves (152 lb vs 123 and 116 lb).

Early weaning is not recommended for all cow herds every year, but this trial shows that it is a practice that can produce high rebreeding rates while reducing the feed resources needed for fall-calving cows during the winter. The decision whether to use early weaning in a fall-calving herd would depend on the expected rebreeding rate, relative costs of forages and supplements for the cows and costs for labor, health programs and feed resources for early weaned calves.

Literature Cited

- Lusby, K.S., et al. 1985. Salt-limited creep feed for nursing calves. Okla. Agr. Exp. Sta. Res. Rep. MP-117:249.
- Lusby, K.S. and R.P. Wettemann. 1980. Effects of early weaning calves from first-calf heifers on calf and heifer performance. Okla. Agr. Exp. Sta. Res. Rep. MP-107:55.
- Lusby, K.S. and A.A. Parra. 1981. Effects of early weaning on calf performance and on reproduction of mature cows. Okla. Agr. Exp. Sta. Res. Rep. MP-108:64.