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CREEP FEEDING EFFECTS ON CALF PERFORMANCE AND UDDER AND CARCASS COMPOSITION OF CHAROLAIS SIRED BEEF HEIFERS

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SUMMARY

Fifty crossbred cows with Charolais sired calves at side were used in an experiment to evaluate creep feeding effects on carcass yield, quality and effects on beef heifer udder development. Treatments were randomly assigned (CREEP v.s. CONTROL) on Aug. 15, 1994 and applied for 74 days. At weaning cows were measured for average daily gain (ADG) and body condition score (BCS) change. There was no difference (P=.29) in ADG of BCS change for cows of either treatment. After weaning calves remained in assigned groups and fed similar diets through backgrounding (60 d) and finishing (180 d). At slaughter, udder composition was measured by determining total udder weight, dry matter (DM), lipid and protein content. Fat-free mass, carcass quality, yield grade, loin eye area (LEA) and back fat (BF) measurements were collected for all calves. Creep fed calves had higher weaning weights (P=.04) and higher ADG (P=.03) than control calves. Treatment did not effect (P>.29) yield grade, marbling score or LEA. However, creep fed calves had higher BF measurements (.32 v.s .26, P=.08) than did noncreep fed calves.

INTRODUCTION

Previous creep feeding research with replacement beef heifers has demonstrated increased fat deposition in the mammary gland, a decrease in milk production during future lactations, reduced progeny weaning weights and

decreased cow longevity. Holloway and Totusek et al. (1979) reported heifers that were creep fed produced 0.31 lbs less milk/d during their first lactation than heifers that received no additional feed during the pre-weaning period. At the University of Florida, Prichard and Marshall et al. (1988) found that creep fed heifers had higher total lipid content (6.4 v.s. 5.2 lbs) compared to heifers that did not receive creep.

These studies were conducted 15-20 years ago using cattle that were different in frame size, body composition and growth potential compared to the genetic base of cattle today. The objectives of this study were to investigate the effects of creep feeding on carcass composition and quality in beef calves and to evaluate the effects of creep feeding on mammary tissue development in Charolais sired beef heifers.

MATERIALS AND METHODS

Preweaning Phase

Fifty British crossbred cows with Charolais sired calves at side were used in the experiment. Cow-calf pairs were assigned to one of two pastures each consisting of two paddocks. Two dietary treatments were assigned randomly to paddocks within pastures designated A or B. Pasture A, consisting of two 160 acre paddocks with 13 calves (6 heifers, 7 steers) that were offered a high fiber creep ration (CREEP, Table 1) free choice beginning on day 0 of the experiment (August 15, 1994) in one paddock. The remaining 13 calves received no supplemental nutrition (CONTROL) other than native range forage and milk from their dams in the other 160 acre paddock. Treatments were assigned in the same manner for pasture B (two 160 acre paddocks) except 12 cow-calf pairs (6 heifers, 6 steers) were used for each treatment. On d 0 and 74 (weaning date) cows were measured for bodyweight (BW) and body condition score (BCS) and calves were measured for BW, BCS, hip height (HH). Resistance (Rs) and Reactance (Xc) were also measured with the use of Bio-Electrical Impedance Analyzer to develop accurate predictive equations to calculate amount of saleable product and intramuscular fat (marbling).

Postweaning Phase

After weaning, heifers and steers remained in their assigned groups and were placed in one of four pens. Calves were fed similar diets through backgrounding (60d) and finishing (approximately 180 d). Udder composition was

measured by determining total udder weight, dry matter (DM), lipid and protein content at slaughter. Fat-free mass, carcass quality grade, yield grade, loin eye area (LEA) and back fat (BF) measurements were collected on all calves.

RESULTS

Treatment did not affect (P> .29) final weight, ADG or BCS change for cows in the is study (Table 2). Cows lost 2.41 and 2.38 lb./d for creep and control groups, respectively. This is contradictory to work done by Prichard et al. (1989) who found that cows with calves offered creep feed gained more weight during lactation (49.5 lb) compared to cows with calves that received no supplemental creep (14.3 lb). Prichard et al. (1989) also reported that BCS was not affected by creep which is similar to the results found in this study.

Calf performance prior to weaning is presented in (Table 3). Creep fed calves were 46 lbs. heavier (P=.04) than calves receiving no supplementation at weaning. Calves that received creep consumed 7.3 lbs/d of feed prior to weaning. Every additional pound of gain above CONTROL calves required 11.8 lbs of creep feed. Average daily gains were 2.14 and 1.48 for CREEP and CONTROL calves (P=.03), respectively. Improved calf performance agrees with Faulkner et al. (1993) and Cremin et al. (1991). Hip height was measured to determine if frame size would be effected as a result of treatment. However, change in HH measurements during the creep feeding period was not influenced by treatment (P=.32).

Carcass measurements are given in (Table 4). Although backfat was lower (P=.08) for control calves, yield grade was not different between the two treatments (P=.34). Other studies show mixed results regarding backfat thickness. Increased backfat of creep-fed calves has been reported by Martin et al. (1981) and Prichard et al. (1980); however, no difference in backfat of creep v.s. noncreep calves was noted by Rouquette et al. (1983) and Cremin (1989). Tarr et al. (1994) reported no significant difference in yield grade of creep v.s. noncreep calves. However, Slyter (1978) reported increased marbling score, yield grade, LEA, BF and kidney fat for creep v.s noncreep fed calves.

IMPLICATIONS

Cow performance was not affected as a result of treatment. Calves receiving creep feed gained more weight and

had higher ADG than calves receiving no supplementation. Creep fed calves appeared to have higher yield grades and marbling scores. However, we do not have enough confidence statistically to draw this conclusion. Back fat was significantly higher for creep v.s. noncreep fed calves but statistically did not effect yield grade.

Creep feeding improved weaning weights but did not improve carcass yield or quality. The cost of the creep ration formulated for this experiment cost approximately $120/ton. Every additional pound of gain (that above control calves) for creep fed calves cost approximately $ 0.71. Treatment did not effect carcass quality or yield which are two elements in determining final value. If creep feeding does not positively effect carcass quality and yield perhaps it is more cost effective for the producer to develop calves with lower weight gains early, and then increase nutrition after puberty to achieve maximum efficiency in retained ownership situations.

Table 1. Creep feed formulation (As fed basis) used in the experiment.

Ingredients	Percent
Dry corn gluten feed[a]	54.5
Beet pulp[b]	42.5
Limestone	0.95
TM salt	0.95
Vitamin ADE	.075
Lacalocid[c]	0.04
Bentonite	0.85

[a]Dry corn gluten feed contributed by Archer Daniels Midland Co., Ceder Rapids Plant, Iowa.

[b]Beet pulp contributed by Midwest Agri-Commodities, Corte Madera, California.

[c]Ionophore premix supplied 30 mg lacalocid/lb of feed.

Table 2. Cow weight, average daily gain (ADG) and body condition score (BCS) measurements for creep v.s. control.

Measurement	Creep	Control	Significance[a]
In weight, lb	1237	1248	.78
Final weight, lb	1059	1072	.84
ADG, lb	-2.41	-2.38	.29
BCS change	-0.24	-0.04	.52

[a] Probability that the difference between the means was due to chance.

Table 3. Calf weights, average daily gain (ADG) and hip height (HH) measurements for creep v.s. control.

Measurement	Creep	Control	Significance[a]
In weight, lb	405	406	.69
Final weight, lb	562	516	.04
ADG, lb	2.14	1.48	.03
HH change, in	3.76	3.16	.32

[a] Probability that the difference between the means was due to chance.

Table 4. Carcass yield and marbling measurements for creep v.s. control.

Measurement	Creep	Control	Significance[a]
Yield grade[b]	2.43	2.24	.34
Marbling score[c]	446.8	416.8	.29
Loin Eye Area, in^2	12.14	12.49	.45
Back Fat, in	.32	.26	.08

[a] Probability that the difference between the means was due to chance.

[b](1-5) 1= lean, 5= excess fat.

[c](200=standard; 300=select; 400=choice; 500=prime)

Table 5. Udder composition for creep v.s. control heifers.

Measurement	**Creep**	**Control**	**Significance[a]**
Udder weight			
% Dry matter	80.6	79.3	.44
% Protein			

% Fat			

[a] Probability that the difference between the means was due to chance.

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