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Robert T. Brandt Jr.

Christopher D. Reinhardt

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Abstract

One hundred eighty yearling steers (743 lb) were blocked by weight; implanted with Synovex® (S), Synovex plus Finaplix® (SF), or not implanted (C); and fed diets containing 11.75% (L), 13.0% (M), or 14.25% (H) crude protein with all supplemental protein above 11.75% being supplied by corn gluten meal and blood meal in a 50:50 ratio (crude protein basis). An addition al protein level fed to S and SF implanted cattle was H for the first 70 days on feed and L thereafter (H-L). Animals were reimplanted on day 70. Steers treated with SF gained faster and more efficiently than non-implanted cattle. Differences in protein level had no effect on fat deposition in control steers, but cattle receiving SF and consuming M had more back fat and kidney, pelvic, heart (KPH) fat than those fed either H or L and also had more marbling than those fed H. Also, no apparent differences occurred between cattle fed M throughout the trial and those switched from H to L at 70 days.

Keywords

Cattlemen's Day, 1994; Kansas Agricultural Experiment Station contribution; no. 94-373-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 704; Beef; Estradiol; Trenbolone acetate; Implants; Escape protein; Protein level

EFFECT OF RUMEN-ESCAPE PROTEIN LEVEL ON FEEDLOT PERFORMANCE AND CARCASS TRAITS OF IMPLANTED VS NONIMPLANTED YEARLING STEERS

C. D. Reinhardt and R. T. Brandt, Jr.

Summary

One hundred eighty yearling steers (743 lb) were blocked by weight; implanted with Synovex® (S), Synovex plus Finaplix® (SF), or not implanted (C); and fed diets containing 11.75% (L), 13.0% (M), or 14.25% (H) crude protein with all supplemental protein above 11.75% being supplied by corn gluten meal and blood meal in a 50:50 ratio (crude protein basis). An additional protein level fed to S and SF implanted cattle was H for the first 70 days on feed and L thereafter (H-L). Animals were reimplanted on day 70. Steers treated with SF gained faster and more efficiently than non-implanted cattle. Differences in protein level had no effect on fat deposition in control steers, but cattle receiving SF and consuming M had more back fat and kidney, pelvic, heart (KPH) fat than those fed either H or L and also had more marbling than those fed H. Also, no apparent differences occurred between cattle fed M throughout the trial and those switched from H to L at 70 days.

(Key Words: Estradiol, Trenbolone Acetate, Implants, Escape Protein, Protein Level.)

Introduction

Cattle receiving growth promotants, particularly trenbolone acetate (TBA), have greatly enhanced rates of lean deposition, which may increase their demand for metabolizable protein above traditional levels of supplementation. The amount of protein reaching the small intestine can be increased by using high rumen-escape protein sources such as blood meal and corn gluten meal, while requirements for ruminally available nitrogen are met with urea.

Experimental Procedures

One-hundred eighty head of mixed crossbred yearling steers were received off North Texas summer grass in September, 1992. Cattle were dewormed, vaccinated, ear-tagged, and fed a 57% concentrate ration for 28 days on a receiving study. The cattle were weighed (October 13 and 14, 1992; avg 743 lb); implanted with either Synovex-S (S), Synovex-S plus Finaplix (SF), or not implanted (C); and stepped up onto a 12% roughage finishing ration (Table 1). Cattle also were assigned to a diet containing either 11.75%, 13%, or 14.25% crude protein. The two higher protein levels were achieved with a 50:50 blend (crude protein basis) of blood meal and corn gluten meal (crude protein basis). An additional protein level assignment fed to S and SF implanted cattle was H for the first 70 days on feed and L thereafter (H-L). Cattle were reimplanted with their respective implants on day 70 and weighed at 35-day intervals until finished. Final weights were the averages of weights on 2 consecutive days (March 30 and 31, 1993). Hot carcass weights were taken at slaughter, and 12th rib fat thickness, ribeye area, KPH estimation, and marbling measurements were taken after a 24-hour chill.

Results and Discussion

Rate of gain was slower than expected for this size and type of cattle, even though intake was near expected levels across all treatments, probably because of several periods of freezing rain. These low gains

may have limited the response to bypass protein supplementation.

Final weights in this study were hot carcass weights adjusted to an average dressing percent of 61.1. Cattle implanted with SF gained faster (P<.05; Table 2) and more efficiently than nonimplanted steers. Steers implanted with SF also had heavier carcasses and greater ribeye areas (P<.05).

Interactions (P<.10) between implant and protein level affected dressing percent, fat thickness, KPH fat, and marbling. Steers receiving SF and consuming M had slightly lower dressing percentages, which may have been a function of slightly higher intake. Within the control group, no differences occurred in fat deposition, but within the SF treatment, steers consuming M had more back and KPH fat than those consuming either L or H (P<.10) and slightly more marbling than steers consuming H (P=.14).

Implants have been shown to be most effective in cattle with superior genetics for growth and in cattle on high energy intakes. Feedlot trials have shown benefits of escape protein supplementation, with the greatest advantages in fast gaining cattle. Although the SF-treated steers outperformed controls, faster gains across all treatments would be expected during milder weather. For this reason, further research is warranted on crude protein level and escape protein supplementation for implanted feedlot cattle.

Table 1. Composition of Experimental Diet

Ingredient	Low	Medium	High
	---------- % of Dry Matter ----------		
Corn	80.47	78.64	76.80
Corn silage	12.0	12.0	12.0
Supplement [a]	7.53	7.54	7.53
Blood meal	—	.79	1.57
Corn gluten meal	—	1.04	2.08
Crude protein	11.75	12.99	14.24

[a]Provided .86% dietary urea. Supplements were formulated so that diets contained (dry basis) .7% Ca, .35% P, .7% K, .35% salt, and 100 ppm Zn.

Table 2. Effects of Implant and Protein Level [a] on Steer Performance

	Control			Synovex® + Finaplix®				Synovex®	
Item	Low	Med	High	Low	Med	High	High-Low	Med	High-Low
Daily gain, lb [bc]	2.50	2.16	2.17	2.54	2.54	2.37	2.71	2.38	2.38
Daily feed, lb	20.28	20.45	20.15	20.57	20.84	20.12	19.98	20.42	20.67
Gain:Feed [b]	.119	.103	.103	.120	.118	.115	.131	.115	.115
Dressing % [d]	63.0[e]	61.3[ef]	59.5[ef]	60.5[ef]	58.6[f]	60.4[ef]	62.7[ef]	61.9[ef]	61.8[ef]
Carcass, lb [bc]	721	687	687	724	726	709	741	709	708
Back fat, in [d]	.44[e]	.46[ef]	.47[ef]	.45[e]	.58[f]	.39[e]	.46[ef]	.40[e]	.47[ef]
KPH, % [d]	2.61[fgh]	2.63[gh]	2.64[gh]	2.37[e]	2.70[h]	2.38[e]	2.43[efg]	2.41[ef]	2.43[efg]
REA, sq. in [b]	12.0	11.8	11.9	12.7	13.0	12.4	12.6	12.6	12.1
Yield grade	3.03	3.03	3.03	2.80	3.09	2.66	2.90	2.64	2.99
Marbling [di]	4.10[g]	4.11[g]	4.14[g]	3.69[ef]	3.88[efg]	3.52[e]	3.65[ef]	3.68[ef]	3.97[fg]
Choice, %	35	50	40	25	30	20	25	30	35

[a]Low=11.75% crude protein, Med=13% crude protein, High=14.25% crude protein.

[b]Synovex + Finaplix vs. Control (P<.05). Adjusted to common dressing % of 61.1.

[c]Low vs. High (P<.10).

[d]Protein × Implant interaction (P<.10).

[e,f,g,h]Within a row differ (P<.10).

[i]3=Slight[0], 4=Small[0].