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Summary

Various implant strategies were compared in heavy yearling steers fed for 98 days. Implant treatments included control (nonimplanted), 72Z (72 mg zeranol), 36TBA (36 mg zeranol plus 140 mg trenbolone acetate [TBA]), 72TBA (72 mg zeranol plus TBA) and ETBA (20 mg estradiol-200 mg progesterone plus TBA). The 72-mg zeranol dosage represents two implants in one site. Combinations of implants were administered, one in each ear. Implanting increased (P<.05) ADG and DMI and decreased (P<.05) feed/gain values. Among implanted steers, no differences (P>.10) in ADG or DMI were observed. Feed/gain was lower (P<.05) for zeranol-TBA combinations than the 72-mg zeranol treatment. Carcasses were heavier and rib eye area was greater (P<.05) in the 72TBA than 36TBA treatment. Kidney-pelvic-heart fat was lower (P<.05) when the ETBA combination was used.

(Key Words: Feedlot, Steers, Implant, Carcass.)

Introduction

Several implants are currently approved for use in growing and finishing cattle. Active ingredients include zeranol, estradiol, progesterone, and trenbolone acetate. Some of these compounds have additive effects on growth promotion. Implants also affect carcass traits which can be beneficial or detrimental.

The simultaneous administration of implants is not specifically approved by FDA, although the time window for reimplanting is not defined. Studies evaluating complimentarity of these implants will help identify appropriate combinations to submit for FDA approval.

Materials and Methods

Crossbred yearling steers (240 head; 826 $\pm$ 4.8 lb) were stratified by weight and breed type before allotting to 30 pens of eight steers. Implant treatments included control (nonimplanted), 72Z (72 mg zeranol[3]), 36TBA (36 mg zeranol plus 140 mg trenbolone acetate[4]), 72TBA (72 mg zeranol plus 140 mg trenbolone acetate) and ETBA (20 mg estradiol benzoate-200 mg progesterone[5] plus 140 mg trenbolone acetate). The 72-mg zeranol dosage was placed in one implant site. Combinations of implants were administered, one in each ear.

Implants were administered on the second of two consecutive day weights used as the initial weight. Steers were weighed in the morning following a 14-hour removal of feed and water. Similar weighing procedures were used at 97 and 98 days on feed. Vaccinations[6] and anthelmintic[7] treatment were administered during initial weighing.

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[4]Finaplix-S, Hoescht Roussel, Summerville, NJ, 08876.
[5]Synovex-S, Syntex Animal Health Division, Des Moines, IA, 50303.
[6]BRSV Vac 4, Cutter Animal Health Division, Shawnee, KS, 66201.
[7]MSDAGVET, Rahway, NJ, 90965, and Coopers Animal Health, Kansas City, KS, 66103.

The receiving diet (Table 1) was fed through the first 3 days of the experiment. An abrupt switch to the finishing diet occurred on day 4. Feed deliveries were limited to 7.8 lb per head per day for 2 days and were then gradually increased to appetite over a 21-day period. Dry matter intakes were summarized at 7-day intervals.

TABLE 1. FEEDLOT DIETS[a]

Ingredient	Receiving[b]	Finishing[b]
Corn silage	75.00	12.00
Whole shelled corn	16.10	26.54
High moisture corn		53.09
Molasses		2.00
Soybean meal, 44%	7.81	4.56
Calcium carbonate	.71	1.13
Potassium chloride		.38
Trace mineralized salt	.25	.25
Dicalcium phosphate	.13	.05

[a] Percentage dry matter basis.
[b] Provides 25 g/T monensin and 1000 IU supplemental vitamin A per lb.

The afternoon following the final feedlot weight, steers were transported 70 miles to the IBP plant at Luverne, MN. Hot carcass weight was recorded at slaughter. Rib eye area and rib fat thickness were measured after a 24-hour chill. Marbling scores and KPH percentage were designated by the federal grader on duty.

Data were analyzed by procedures appropriate for a completely random design. Performance data were analyzed on a pen mean basis. Carcass data were tested considering the experimental unit to be individual steers. Percentage choice data were tested by Chi square analysis.

Mean separation tests of cumulative feedlot performance were accomplished by contrasts of (1) control vs implanted, (2) 72Z vs 36TBA and 72TBA, (3) 36TBA vs 72TBA, and (4) 36TBA and 72TBA vs ETBA.

Results

Three steers had to be deleted from the study. One steer died of bloat and two steers became lame. These were unrelated to treatment. Initial weights of these steers were deleted from the data set. The individual contributions of these steers to pen mean daily dry matter intakes remains in the data set.

Initial and final weights are not fully shrunk weights (14 hours). A shrunk final weight could be estimated using a 3% shrink factor. Mean weight at the packing plant was 3.1% lower than the final weight. This adjustment would lower ADG and increase F/G values reported in Table 2.

Implanting increased ($P<.05$) ADG and DMI and decreased ($P<.05$) feed/gain requirements. No differences in ADG or DMI were observed between implant treatment groups. Steers implanted with zeranol plus TBA combinations were more efficient ($P<.05$) than steers implanted with only 72 mg zeranol.

Dual implanting with 72TBA increased ($P<.05$) carcass weight and rib eye area over dual implanting with 36TBA. Steers dual implanted with 36TBA or 72TBA produced carcasses with more ($P<.05$) KPH fat than if steers received ETBA. No other implant effects on carcass traits were observed for rib fat, muscling or quality grade. These steers averaged 58% choice across all treatments. Rib fat was measured at 84 days using real time ultrasound. Those data indicated that rib fat was reduced by implanting. Carcass measurements followed a similar numerical trend.

It could be argued that these steers should have been fed another 2 weeks. Rib fat thickness of .40 inches is on the low side of current feeding endpoint. However, the push is being made to lower fatness and data should be available describing conditions used here. All of the implant treatments were efficacious. Dual implanting with zeranol plus TBA was comparable to ETBA and may hold a slight advantage over 72 mg zeranol. Replication of these treatments with other groups of steers is indicated before more definitive conclusions can be made.

TABLE 2. EFFECTS OF IMPLANT TREATMENT ON CUMULATIVE FEEDLOT PERFORMANCE AND CARCASS TRAITS[a,b]

	Control	72Z	36TBA	72TBA	ETBA	SEM
Initial wt, lb	825	827	826	826	825	4.8
Final wt, lb[d]	1152	1185	1192	1204	1203	9.2
ADG, lb[d]	3.34	3.65	3.73	3.86	3.86	.072
DMI, lb[d]	21.34	22.34	22.90	22.34	22.28	.238
F/G[d,e]	6.42	6.13	5.87	5.79	5.78	.118
Carcass wt, lb[f]	690	715	709	725	723	10.0
Rib fat, in.	.422	.405	.383	.409	.391	.020
Rib eye area, in.[2f]	12.02	12.15	12.50	12.82	12.49	.181
KPH, %[g]	2.58	2.36	2.40	2.41	2.27	.078
Yield grade	2.83	2.84	2.63	2.66	2.68	.098
Marbling score[c]	4.80	4.61	4.45	4.60	4.71	.102
Percent choice	70.2	52.1	47.9	54.4	64.6	

[a] Performance data on pen mean basis.
[b] Carcass data are least squares means of individual steer data.
[c] Average small = 5.0; average slight = 4.0.
[d] Control vs rest (P<.01).
[e] 72Z vs 36TBA and 72TBA (P<.05).
[f] 36TBA vs 72TBA (P<.05).
[g] 36TBA and 72TBA vs ETBA (P<.05).