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1971

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Recommended Citation

Thiex, P. J., "Feedlot Bulls and Steers Treated With Diethylstilbestrol and Zeranol" (1971). *South Dakota Cattle Feeders Field Day Proceedings and Research Reports, 1971*. Paper 9.
http://openprairie.sdstate.edu/sd_cattlefeed_1971/9

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Feedlot Bulls and Steers Treated With
Diethylstilbestrol and Zeranol

P. J. Thiex and L. B. Embry

This experiment is one of a series to study effects of castration, growth stimulating compounds and various feeding and management systems on performance and carcass characteristics of feedlot male and female cattle. It involved a comparison of bulls with steers and their response to diethylstilbestrol or zeranol (a resorcylic acid lactone compound shown to have growth stimulating properties) implants when fed high-concentrate diets.

Procedures

The animals used in this experiment were 42 bulls and 64 steers. They were from the experimental cow herd at the Pasture Research Center, Norbeck. The bulls and steers were from Hereford cows where an A.I. program using semen from one Hereford bull was used for about 6 weeks. Yearling Hereford bulls which were half-sibs or from half-sib sires were then turned with the cows with one bull to each experimental pasture of 8 to 10 cows.

At weaning, the bulls used in the experiment were selected from the top end of the calves. Those remaining were then castrated. Both bulls and steers were wintered on high roughage diets and pastured one season before being finished in the feedlot. The bulls were pastured with cows in experimental pastures containing 8 to 10 cows which had been through an A.I. program of about 6 weeks.

The bulls were allotted to 6 pens of 7 each and the steers to 6 pens of 9 each for the finishing experiment. The experimental diet was composed of 3 lb. of alfalfa-brome haylage, 2 lb. of a 40% protein supplement and a full feed of whole corn grain. A higher level of haylage was fed initially, and it was gradually reduced to the desired level while the grain was increased to a full feed. Feeding was one time daily in outside paved pens.

The protein supplement contained the following ingredients (%): soybean meal (44%), 50.5; ground corn grain, 26.0; urea (281%), 5.5; ground limestone, 6.0; trace mineral salt, 6.0; dicalcium phosphate, 3.0; and potassium chloride, 3.0. Vitamins A and E were added to furnish 10,000 and 100 I.U., respectively, per pound of supplement.

Experimental treatments for bulls and steers were control, 36 mg. diethylstilbestrol implant or 36 mg. zeranol implant. The implants were administered one time at the beginning of the experiment. The cattle were fed for 158 days and the experiment terminated.

Results

Weight gains for both bulls and steers (table 1) were considerably less than in a previous experiment (A.S. Series 70-13). The lack of response to the

implant treatment by bulls of the weights and age used is in agreement with the previous experiment. However, there were smaller differences between bulls and steers and a smaller response by steers to the diethylstilbestrol implant.

It is apparent from tables 1 and 2 that the comparative performance between bulls and steers is influenced by the implant treatment. Control and implanted bulls appeared to gain at about the same rate with similar feed requirements.

Control bulls gained 0.32 lb. (13.2%) more than control steers with 4.5% lower feed requirements. Steers implanted with 36 mg. diethylstilbestrol gained 5.3% more than control steers with 2.5% less feed. The response to diethylstilbestrol by steers in this experiment is somewhat lower than generally obtained. In the comparison, with diethylstilbestrol, bulls gained 7.0% less than steers with 2.7% higher feed requirement.

Zeranol implants of 36 mg. resulted in the largest daily gain by the steers. Improvement in gain amounted to 11.5% with 5.4% less feed in comparison to control steers. In this comparison, rate of gain and feed efficiency varied only slightly between bulls and steers.

Differences in carcass characteristics measured as affected by implant treatment were small. Bulls rated higher in dressing percent, conformation grade and size of the loin eye than did steers. They had less marbling, kidney fat and less fat covering and graded lower. Carcasses of bulls were also rated slightly older, darker and less firm in comparison to steer carcasses.

Summary

It would appear that weight gains, feed efficiency and carcass characteristics of yearling feedlot bulls are affected little, if any, by administering diethylstilbestrol or zeranol implants at 36 mg. per head daily.

Weight gains and feed efficiency of steers were improved by this level of the implants. While zeranol resulted in more improvement in this experiment, other experiments have indicated similar responses from 36 mg. implants of zeranol as from 36 mg. of diethylstilbestrol.

Control bulls gained at a faster rate and with lower feed requirements than control steers (13.2% more gain with 4.5% less feed). However, differences became much smaller when steers were implanted with diethylstilbestrol or zeranol.

When bulls and steers of the same approximate age were fed the same number of days in the feedlot, bulls were considerably heavier, had a higher dressing percent, a smaller amount of marbling, kidney fat and fat covering and had a lower carcass grade. Bulls had a larger loin eye and were rated slightly older by carcass age, and the meat appeared to be darker and less firm than for steers.

Table 1. Growth Stimulating Compounds for Bulls and Steers
November 4, 1970-April 12, 1971 - 158 Days

	Bulls			Steers		
	Control	DES 36 mg.	Zeranol 36 mg.	Control	DES 36 mg.	Zeranol 36 mg.
Number in treatment	14	14	14	18	18	18
Init. shrunk wt., lb.	773	774	774	702	705	707
Final shrunk wt., lb.	1206	1207	1210	1087	1109	1134
Avg. daily gain, lb.	2.75	2.74	2.76	2.43	2.56	2.71
Avg. daily feed, lb.						
Corn	20.02	21.18	19.99	18.33	18.77	19.48
Haylage	3.44	3.43	3.44	3.45	3.44	3.44
Supplement	2.00	2.00	2.00	2.00	2.00	2.00
Total	25.46	26.53	25.43	23.78	24.21	24.92
Feed/100 lb. gain, lb.						
Corn	731	773	724	751	737	720
Haylage	126	125	125	141	135	127
Supplement	72	72	71	81	77	73
Total	929	970	920	973	949	920
Dressing percent	62.8	63.4	62.4	61.2	61.7	62.2
Conformation ^a	22.0	22.0	21.8	20.8	20.8	20.6
Marbling ^b	4.5	4.6	4.7	5.6	5.5	5.1
Carcass grade ^a	19.6	19.3	19.5	19.6	19.9	20.2
Maturity ^c	22.3	22.3	22.0	23.0	22.9	22.9
Color ^d	4.2	4.0	4.3	4.9	4.9	5.1
Firmness ^e	4.9	4.9	5.1	5.4	5.6	5.0
Kidney fat, %	2.3	2.4	2.3	3.1	2.6	3.0
Fat thickness, in.	0.38	0.50	0.52	0.58	0.60	0.75
Loin eye area, sq. in.	13.37	13.20	13.08	12.18	12.3	11.95

^a Choice = 20; Good = 17. Graded to one-third of a grade.

^b Trace = 3; slight = 4; small = 5.

^c Higher number represents younger carcass, A+ maturity = 22, A maturity = 23.

^d Higher number represents lighter meat, cherry red = 4; light cherry red = 5.

^e Higher number represents firmer meat, slightly soft = 4, moderately firm = 5, firm = 6.

Table 2. Comparative Performance of Bulls and Steers Treated With Various Growth Stimulating Compounds

	Control		DES 36 mg.		Zeronal 36 mg.	
	Gain %	Feed %	Gain %	Feed %	Gain %	Feed %
Treated vs. control ^a						
Bulls	--	--	-.36	4.4	0.36	1.0
Steers	--	--	5.3	-2.5	11.5	-5.4
Bulls vs. steers ^b	13.2	-4.5	7.0	2.2	1.8	--

^a Percent change from control.

^b Percent change from steers.