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L. B. Embry
South Dakota State University

W. S. Swan

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Diethylstilbestrol, Zeranol or Synovex-S Implants
for Finishing Steers

L. B. Embry and W. S. Swan

Numerous experiments during the past several years have shown that administering diethylstilbestrol (DES), zeranol or Synovex improves weight gain and feed efficiency of growing and finishing steers and heifers. The improvement has been reported from an early age through growing and finishing by continuous feeding of DES or reimplanting of the products at appropriate intervals. Improvement has been reported with numerous types of rations as to energy content and levels and sources of protein and other essential nutrients. However, the degree of response may vary with the nutritional adequacy of the rations.

Direct comparisons between DES, zeranol and Synovex implants and a non-implanted control under various conditions are more limited. In the experiment reported here, implants of the three products were compared to a nonimplanted control when steers were fed finishing rations with and without roughage.

Procedure

One hundred forty-four steers (72 Hereford and 72 Angus x Hereford) used in this experiment were purchased in mid-January and fed a growing ration composed of a full feed of corn silage with 2 lb. of protein supplement for a period of 93 days. The supplements were formulated to contain 32% protein using soybean meal or urea as the supplemental source. The steers were fed in 24 pens of 6 each (3 Hereford and 3 Angus x Hereford). Steers were implanted with 36 mg DES, 36 mg zeranol, Synovex-S (200 mg progesterone and 20 mg estradiol benzoate) or served as nonimplanted controls. Each implant treatment group consisted of six pens (36 steers) and were balanced as to dietary treatments.

Following the 93-day growing experiment, the steers were adjusted to a high-concentrate ration of reconstituted high-moisture corn grain with 4 lb. of alfalfa haylage. The adjustment was made over a period of 10 days from initial levels of 5 lb. of corn grain and 18 lb. of haylage. For another 32 days, the rations consisted of 4 lb. of the haylage with a full feed of corn grain.

During the preliminary period of adjustment to the high-concentrate rations, the steers were reimplanted with each implant treatment group receiving the same material and dosage level as at the beginning of the growing experiment. The reimplants were administered 105 days after the initial ones and about 1 month before the beginning of the finishing experiment.

Following the preliminary period of adaptation to high-concentrate rations, the cattle were reallocated into 24 pens each with six steers (3 Hereford and 3 Angus x Hereford) within implant treatment groups on basis of weight. Rations

during the finishing experiment consisted of a full feed of reconstituted high-moisture corn grain and 2 lb. of supplement fed as all-concentrate rations or with 4 lb. alfalfa haylage. Three types of supplement were used--corn, soybean meal or urea. Dietary treatments were balanced as to implant treatments.

The reconstituted high-moisture corn grain was stored in an oxygen-limiting silo. Considerable cracking of the grain occurred as it was blown into the silo. No further processing of the grain was used.

The experiment was terminated after 118 days and the cattle were marketed. Carcass data were obtained following slaughter.

Results

Results from implant treatments obtained in the finishing experiment are shown in table 1. Differences shown in initial weights for the treatment groups represent responses to the implant treatments during the growing experiment (previously reported in A.S. Series 74-3). Improvement in weight gain during the growing experiment amounted to 13.8, 11.0 and 13.3%, respectively, over nonimplanted controls for DES, zeranol and Synovex-S. Feed efficiency was also improved 9.8, 8.2 and 9.5%, respectively, for DES, zeranol and Synovex-S.

There were some differences in dressing percent between implant treatment groups. Nonimplanted cattle had the highest dressing percent (63.5%) and DES-implanted cattle the lowest (61.6%). Because of these variations, final weights were calculated from carcass weights using a constant yield of 62%. Average daily gains and feed requirements per unit of gain were calculated on basis of adjusted final weights.

Nonimplanted steers gained 2.64 lb. daily over the 118-day experiment. Those implanted with DES gained 0.34 lb. (12.9%) more daily than controls. The improvement is within the range commonly reported for DES administered to finishing cattle. Somewhat greater improvement in weight gains over controls was obtained for zeranol and for Synovex-S than for DES (18.2 and 24.6%, respectively). The improvements here are greater than averages usually associated with these two products. However, responses of these magnitudes, including DES, have been reported from past research.

There was a pronounced increase in feed intake (corn) when steers were implanted, with the greatest increase resulting from Synovex-S. The increase in feed intake for the DES implant was about the same over the control group as was the improvement in rate of gain. This resulted in essentially no improvement in feed efficiency for DES. There were small improvements in feed efficiency for zeranol (2.8%) and for Synovex-S (5.7%) over nonimplanted controls.

Average carcass grades were between low and average Choice, except just under the low Choice for the group implanted with Synovex-S. All cattle were fed the same number of days, and the implanted cattle making faster gains had heavier carcasses. The implanted steers having heavier carcasses had slightly larger rib eyes and more fat covering than did controls with only small differences between implant groups.

Summary

One hundred forty-four steers were fed all-concentrate rations or high-concentrate rations of reconstituted high-moisture corn, 4 lb. alfalfa haylage and 2 lb. supplement during a 118-day finishing experiment. When implanted with 36 mg DES, 36 mg of zeranol or Synovex-S (200 mg progesterone and 20 mg estradiol benzoate), improvements in rate of gain over nonimplanted controls (36 steers per treatment group) amounted to 12.9, 18.2 and 24.6%, respectively, for DES, zeranol and Synovex-S. Improvements for zeranol and Synovex-S were greater than usually obtained with these products. However, some variation in degree of response may be encountered, and the average response over several experiments is needed upon which to base expected improvements.

Implant treatments resulted in pronounced increases in feed intake (corn) with improvements in feed efficiency being somewhat less in comparison to non-implanted controls than for weight gain. Improvements in feed efficiency amounted to 0.6, 2.8 and 5.7%, respectively, for DES, zeranol and Synovex-S.

There were no important effects of implant treatment on carcass characteristics measured when all steers were fed the same number of days, except for slightly less marbling and lower carcass grades for those implanted with Synovex-S. Heavier carcasses from implanted steers making faster rates of gain had larger rib eyes and more fat covering.

Results obtained were from steers implanted 105 days prior to the reimplant with the same product and dosage level. Time from implanting to slaughter was 150 days (32 days prior to the 118-day experiment).

Table 1. Implant Treatments for Finishing Cattle
(June 21 to October 17--118 days)

	Control	DES	Zeranol	Synovex
Number of animals	34	36	36	36
Init. shrunk wt., lb.	741	773	761	767
Adj. final shrunk wt., lb.	1053	1125	1130	1155
Adj. avg. daily gain, lb.	2.64	2.98	3.12	3.29
Avg. daily ration, lb.				
HM corn grain	17.56	20.50	20.79	21.32
Supplement	2.00	2.00	2.00	2.01
Haylage	2.06	2.06	2.06	2.06
Total	21.62	24.56	24.85	25.39
Adj. feed/100 lb. gain, lb.				
HM corn grain	665	688	666	648
Supplement	76	67	64	61
Haylage	78	69	66	63
Total	819	824	796	772
Hot carcass wt., lb.	653	697	700	716
Conformation ^a	20.9	21.6	21.4	21.6
Marbling ^b	5.8	5.5	5.6	5.3
Carcass grade ^a	19.4	19.2	19.4	18.9
Maturity ^c	23.0	23.0	23.0	23.0
Color ^d	4.0	4.0	4.1	4.1
Firmness ^e	5.9	5.7	5.8	5.9
Percent kidney fat	3.2	3.0	3.2	3.1
Loin eye area, sq. in.	11.67	12.07	11.93	12.05
Fat depth, in.	0.65	0.74	0.74	0.79

^aChoice = 20, Good = 17. Graded to one-third grade.

^bModerate = 7, modest = 6, small = 5.

^c23 = A maturity.

^dHigher number represents darker meat.

^eHigher number represents firmer meat.