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Zeranol or Diethylstilbestrol Implants
for Feedlot Lambs

L. B. Embry and J. C. Ebert

Response by feedlot lambs in improved weight gain and feed efficiency to feeding of 2 mg. daily of diethylstilbestrol (DES) or to a 3 mg. ear implant has been a rather consistent finding. Both ewe and wether lambs respond to DES and the degree of response to these levels has often been as much or more than obtained with cattle fed DES at 10 or 20 mg. daily or implanted with 36 mg.

Zeranol has also been shown to be a growth stimulating product for feedlot cattle and sheep. It is cleared as an implant for cattle at 36 mg. and for sheep at 12 mg. A period of 65 days is required between implanting and slaughter for cattle and 40 days for lambs. When administered at the levels cleared for use, response has appeared similar as for DES.

Less research has been conducted with lambs than with cattle where zeranol has been compared to a control group and to a DES-implanted group. With the removal of DES as an additive to the feed or as an implant, there is more interest in possible substitute products. While response of feedlot lambs to DES is of no practical concern at present, results from zeranol in comparison to DES give a more thorough evaluation of the product than studies with a comparison to only a control group. Two such experiments have been completed and are reported herein.

Experiment 1

Procedures

This experiment involved 432 ewe and wether Texas lambs. The lambs were allotted into 36 pens on the basis of weight within sex groups with 6 ewes and 6 wethers per pen. Dietary treatments consisted of various levels of sulfur with and without supplemental methionine in high concentrate diets. Implant treatments were control, 3 mg. DES and 12 mg. zeranol with each being used for 12 pens of lambs.

Diets consisted of 90% concentrates (rolled corn grain and supplements) and 10% prairie hay. The soybean meal or urea supplements were added to provide diets with a calculated protein level of 12%. Minerals were included to give diets with calculated levels of approximately 0.40% calcium, 0.30% phosphorus and 0.6% potassium. Vitamin A, vitamin E and chlortetracycline were added to furnish 550 I.U., 20 I.U. and 10 mg., respectively, per pound of complete mixed diet.

The lambs were drenched with Tramisol for control of internal parasites and vaccinated two times about 2 weeks apart for prevention of enterotoxemia. Feeding was once daily in outside, unpaved pens without access to shade or shelter. The lambs were raised to a full feed of the diets over a period of about 10 days. They were weighed at 3-week intervals during the experiment.

The experiment was terminated after 90 days. Carcass data were obtained upon slaughter. Weight gains were calculated from initial weight, carcass weight and a constant dressing percent of 54. Feed efficiency was then calculated from daily feed consumed and the corrected daily weight gains.

Results

Statistical analysis of the data revealed no effect of source of protein, sulfur supplementation or methionine supplementation on response to the implant treatments. The results by implant treatments are presented for all dietary treatments in table 1.

Lambs implanted with either 3 mg. DES or 12 mg. zeranol gained faster than controls over the 90-day experiment. For DES the advantage amounted to 0.056 lb. daily (12.0%). The advantage for zeranol over controls amounted to 0.050 lb. daily (10.7%). Effects of implant treatments were significant ($P < .01$), and the results indicate essentially no difference between the two implants for feedlot lambs on the basis of weight gains.

Differences between ewes and wethers were analyzed on the basis of weight gains calculated from initial and final weights. Control wethers gained about 10% faster than control ewes. The advantage was greater for wethers when implanted, amounting to about 16% with a similar response to each implant by ewes and wethers.

Lambs implanted with either DES or zeranol consumed about the same amount of feed but more than for the control group. However, there was an improvement in feed efficiency from the implants, amounting to 8.3% for DES and 6.7% for zeranol.

Lambs implanted with DES had a slightly lower dressing percent. However, carcass weight was about the same as for lambs implanted with zeranol, resulting in rates of gain calculated to the constant dressing percent being about equal. Implanted lambs rated as high or slightly higher than controls on the other carcass characteristics measured. Carcasses from lambs implanted with DES or zeranol appeared quite similar.

Experiment 2

Procedures

One hundred eighty native ewe and wether lambs purchased about mid November, 1972, were used in this experiment. The lambs were allotted into 18 pens with 5 ewes and 5 wethers per pen. Implant treatments were the same as for experiment 1. Lambs receiving each implant treatment were fed two types of protein supplement. Soybean meal furnished the supplemental protein for one group and urea for the other. Implant treatments within protein supplement groups were replicated three times.

Table 1. Zeranol Compared to Diethylstilbestrol for Feedlot Lambs
(Experiment 1 - July 5 to October 3, 1972 - 90 days)

	Control	DES 3 mg. implant	Zeranol 12 mg. implant
No. of lambs	144	144	142
Initial wt., lb.	71.4	71.7	71.6
Final wt., lb.	110.7	117.1	115.7
Avg. daily gain, lb. ^a	0.468	0.524	0.518
Avg. daily feed, lb.			
Prairie hay	0.11	0.11	0.11
Feed mix	2.73	2.82	2.84
Total	2.84	2.93	2.94
Feed/100 lb. gain, lb. ^a	611	560	570
Carcass weight, lb.	61.3	64.1	63.9
Dressing percent	55.4	54.7	55.2
Conformation grade ^b	11.8	12.1	12.2
Maturity ^c	2.0	2.1	2.0
Flank streaking ^d	10.1	10.2	10.7
Feathering ^d	12.3	12.2	12.8
Carcass grade ^b	10.7	10.7	11.0

^a Calculated from initial weight, carcass weight and a constant carcass yield of 54%.

^b Good = 8, Choice = 11, Prime = 14. Graded to one-third grade.

^c A- maturity = 1, A+ maturity = 3.

^d Traces = 8, Slight = 11, Small = 14.

Diets consisted of high moisture ground ear corn and protein supplement. Ear corn fed for the first 48 days was stored in an oxygen-limiting silo and that fed for the remainder was stored in a concrete stave silo. The ear corn was full fed with 0.30 lb. daily of 30% protein supplement with soybean meal or urea. The supplements were fortified with vitamin A, vitamin E, chlortetracycline and minerals including added sulfur.

Feeding and management were similar as for experiment 1 and the experiment was conducted at the same location. The experiment was terminated after 70 days. Weight gains and feed efficiency were calculated on the basis of a 54% carcass yield as for experiment 1. Carcass data were obtained upon slaughter.

Results

The results of this experiment are presented in table 2. There were no effects of the protein supplements on the response to the implant treatments. Results are, therefore, presented by implant treatments averaged for the two protein supplements.

Lambs implanted with DES or zeranol gained faster than control lambs ($P < .01$). The advantage amounted to 0.054 lb. daily (10.4%) for DES and 0.042 lb. (8.1%) for zeranol. Results were similar to experiment 1 and indicate the two products to differ only slightly for feedlot lambs on the basis of weight gains.

Wethers gained more than ewes (4.3%), but the difference was not significant in this experiment. The greatest difference between ewes and wethers was with DES (7.0%).

Lambs implanted with DES consumed slightly more feed than controls. There appeared to be no effect of zeranol on feed consumption. However, feed requirements were 7.3 and 8.0% less, respectively, for DES and zeranol.

Table 2. Zeranol Compared to Diethylstilbestrol for Feedlot Lambs (Experiment 2 - November 21, 1972, to January 30, 1973 - 70 days)

	Control	DES 3 mg. implant	Zeranol 12 mg. implant
No. of lambs	60	60	60
Initial wt., lb.	69.9	69.3	69.3
Final wt., lb.	106.6	111.3	109.0
Avg. daily gain, lb. ^a	0.520	0.574	0.562
Avg. daily feed, lb.			
Ground ear corn	3.52	3.62	3.50
Supplement	0.30	0.30	0.30
Total	3.82	3.92	3.80
Feed/100 lb. gain, lb. ^a	737	683	678
Carcass wt., lb.	57.4	59.1	58.7
Dressing percent	53.9	53.1	53.8
Conformation grade ^b	12.8	12.8	12.8
Maturity ^c	2.0	2.0	2.0
Flank streaking ^d	12.3	12.5	12.0
Feathering ^d	14.8	15.4	15.8
Carcass grade ^b	11.7	11.8	11.9

^a Calculated from initial weight, carcass weight and a constant carcass yield of 54%.

^b Good = 8, Choice = 11, Prime = 14. Graded to one-third grade.

^c A- maturity = 1, A+ maturity = 3.

^d Traces = 8, Slight = 11, Small = 14.

Dressing percent was slightly less for lambs implanted with DES as was true in experiment 1. Therefore, these lambs showed more advantage in weight gain calculated from initial and final weights than on the basis of gains calculated on the basis of 54% carcass yield. Other differences in carcass characteristics measured were small and not significant.

Summary

Two experiments were conducted where lambs were implanted with 3 mg. of DES or 12 mg. of zeranol and compared to a control group. In one experiment, 432 ewe and wether lambs were fed a 90% concentrate diet. In the other, 180 ewe and wether lambs were fed ground ear corn and protein supplement.

On the basis of weight gains adjusted to a 54% carcass yield, lambs implanted with DES gained an average of 11.2% more than control lambs in the two experiments. Gain was 9.4% more than for controls for those implanted with zeranol. The advantage was slightly greater for DES in each experiment.

Implant treatments resulted in an increase in feed consumption except in one experiment with zeranol. Feed efficiency was improved 7.8% for DES and 7.3% for zeranol with only small differences between experiments.

Wether lambs gained at a faster rate than ewe lambs. Differences between ewes and wethers were greater when implanted.

When fed the same number of days, there were only small differences in carcass characteristics measured between treatment groups. Lambs implanted with DES had a slightly lower dressing percent and the highest observed rate of gain. However, carcass weight and weight gain adjusted for dressing percent differed only slightly between DES and zeranol.