

served. This test and previous work indicate that a low level (5 mg. per head daily) of stilbestrol may be more desirable than a higher level (10 mg. per head daily) when fed to steer calves.

Table 34

Results with and without Stilbestrol in the Wintering Ration of Beef Steer Calves.

November 30, 1955, to April 17, 1956—129 days.

Lot number	5 ¹	17A	17B
Number steers per lot	9	9	9
Av. initial wt., lbs.	397	402	397
Av. final wt., lbs.	645	622	607
Av. total gain, lbs.	248	220	210
Av. daily gain, lbs.	1.92	1.70	1.63
Av. daily ration, lbs.:			
Soybean oil meal	1.0	1.0	1.0
Ground milo	3.9	3.9	3.9
Atlas sorgo silage	30.1	29.7	29.7
Mineral (bonemeal and salt)	.08	.03	.03
Salt	.08	.04	.04
Lbs. feed per 100 lbs. gain:			
Soybean oil meal	52.0	58.6	61.4
Ground milo	203.2	229.1	240.0
Atlas sorgo silage	1563.7	1741.3	1824.2
Mineral (bonemeal and salt)	4.3	1.8	1.9
Salt	4.3	2.3	2.4
Feed cost per 100 lbs. gain, ² \$	12.48	12.98	13.81

1. Received 5 milligrams of stilbestrol per head daily for first 56 days and 10 milligrams per head daily thereafter.

2. Stilbestrol cost figured at .06 cent per milligram.

The Effect of Spaying and Feeding of Stilbestrol on the Performance of Heifer Calves on Wintering (High Roughage) Rations, 1955-56.

PROJECT 370

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Spaying is the act of removing the ovaries, which are the primary source of the estrogenic hormones. Stilbestrol is a synthetic compound resembling these estrogenic hormones in its physiological action. Experimental evidence indicates that spaying lowers the rate of gain, whereas stilbestrol has been successfully used in increasing rate of gain in fattening yearling steers. This test is a study of the effect of: 1. spaying, 2. spaying plus stilbestrol, 3. nonspaying, and 4. nonspaying plus stilbestrol, on the performance of heifer calves on a high roughage ration.

Experimental Procedure

Forty good-quality Hereford heifer calves from the Williams Ranches near Lovington, N. M., were used in the test. They were divided into four lots of 10 heifers each on the basis of weight and quality. The heifers were started on test November 16, 1955. November 17 two lots were spayed. The four lots of heifers were fed the same feeds: 3.8 pounds of ground milo grain and 1 pound of soybean oil meal per head daily, all of the sorghum silage they would eat, and free access to bonemeal and salt. About 6 pounds of alfalfa hay was fed per head daily during the last 17 days of the test.

1. The stilbestrol was furnished by the Eli Lilly Company, Indianapolis, Ind., as Stilbosol (a diethylstilbestrol premix).

The experimental treatment for each lot was as follows:

Lot 7—Spayed.

Lot 8—Spayed plus 5 mg. of stilbestrol per head daily the first 56 days, and 10 mg. per head daily during the remainder of the test.

Lot 9—Nonspayed (control lot).

Lot 10—Nonspayed plus 5 mg. of stilbestrol per head daily during the first 56 days of the test and 10 mg. per head daily during the remainder of the test.

The stilbestrol was fed mixed with the soybean oil meal.

Observations

1. Spaying depressed the rate of gain (compare Lots 7 and 9). Apparently the spaying operation itself did not seriously retard the heifers, as may be seen in the table showing the gain of the spayed and nonspayed heifers by periods. The nonspayed heifers made their greatest increase in gain over the spayed heifers during the latter part of the feeding trial. The spayed heifers were least efficient in converting feed to weight gains.

2. Stilbestrol increased the daily gain on spayed heifers by .17 pound (see Lots 7 and 8). However, the spayed heifers fed stilbestrol, Lot 8, did not perform so well as the nonspayed control group, Lot 9.

3. Stilbestrol did not increase the gain of nonspayed heifers.

4. Stilbestrol did not seem to have any harmful effects except that one heifer in Lot 10 had a slightly protruding vagina, but she appears to have recovered with no treatment.

Table 35

The Effect of Spaying and Feeding of Stilbestrol on the Performance of Heifer Calves on Wintering Rations.

November 16, 1955, to April 7, 1956—143 days.

Treatment	Spayed	Spayed ¹ plus stilbestrol	Nonspayed	Nonspayed ¹ plus stilbestrol
Lot number	7	8	9	10
Number heifers per lot	10	10	10	10
Initial wt. per heifer, lbs.	366	365	364	365
Final wt. per heifer, lbs.	574	597	613	613
Gain per heifer, lbs.	208	232	249	248
Daily gain per heifer, lbs.	1.45	1.62	1.74	1.73
Daily ration per heifer, lbs.:				
Ground milo grain	3.81	3.81	3.81	3.81
Soybean oil meal	1.02	1.02	1.02	1.02
Sorghum silage	25.54	25.29	24.86	25.10
Alfalfa hay ²	.82	.81	.82	.81
Mineral (bonemeal and salt)	.07	.08	.05	.06
Salt	.07	.06	.05	.07
Lbs. feed required per 100 lbs. gain:				
Ground milo grain	262	235	219	220
Soybean oil meal	70	63	59	59
Sorghum silage	1756	1559	1428	1448
Alfalfa hay	56	51	47	47
Mineral (bonemeal and salt)	5	3	3	4
Salt	5	5	3	4
Feed cost per 100 lbs. gain ³	15.48	13.55	12.44	12.85

1. Five mg. of stilbestrol was fed the first 56 days of the test and 10 mg. thereafter.

2. Alfalfa hay was fed only the last 17 days of the test at the rate of about 6 pounds per head daily.

3. Feed prices may be found inside the back cover; .6 cent per head per day was charged for 10 mg. of stilbestrol.

Table 36

Daily Gain per Heifer by Periods, Chronologically, for Spayed and Nonspayed Heifers.

Lot number	Spayed	Nonspayed
	lbs. per day	lbs. per day
	7	9
1 (14 days)	1.21	1.43
2 (28 days)	1.64	1.64
3 (28 days)	1.89	1.86
4 (29 days)	1.51	2.27
5 (28 days)86	.96
6 (16 days)	1.56	2.37
143-day average	1.45	1.73

The Value of Stilbestrol in the Fattening Ration of Beef Steers.

PROJECT A-550¹

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and R. F. Cox

The addition of stilbestrol to a high-energy fattening ration has consistently demonstrated its ability to increase rate of gain with older or heavier feeder cattle. At the time this test was initiated, there was considerable confusion as to the effect of stilbestrol upon carcass quality. This cooperative test with large numbers of cattle was conducted to obtain further information on rate and efficiency of gain and the effect upon carcass quality.

Experimental Procedure

Two hundred twenty-five head of good- to choice-quality feeder steers were selected from a group of more than 300. These steers had been assembled at the feed yard and had been on feed two to four weeks before the test began. After 225 steers were selected they were divided into three lots of 75 each by gate cut. Inspection of the lots indicated that they had been divided about as equally as possible. They were weighed and allotted to each treatment at random.

Lot 4 received 10 mg. of stilbestrol per head daily throughout the test. Lot 5 served as the control. Lot 6 was fed 10 mg. of stilbestrol per head daily for the first 56 days only. At the time, many thought that stilbestrol-fed cattle were being discriminated against. Some thought that stilbestrol could be fed for the first part of the feeding period, receive the benefits, and yet show no effects at market time. Therefore, Lot 6 was used to test this theory.

All lots were fed and managed the same except for the addition of stilbestrol. At the end of the feeding period, the cattle were trucked to Oklahoma City for slaughter at the plant of Armour and company. Carcass data, including shrinkage, were obtained on individual animals. (Note—one animal was removed from Lot 5 because of kidney infection; two died in Lot 6 because of urinary calculi and foamy bloat. Weights and feed of these were removed from the results.)

Results

A summary of the results is shown in Table 37.

Observations

1. The addition of stilbestrol to the fattening ration of large steers produced a marked increase in rate and economy of gain. There was no advantage in removing stilbestrol after the first 56 days in this test. Evidence indicates that it is doubtful that the removal of stil-

1. This was a cooperative project. Armour and company supplied the cattle, Eli Lilly and company the stilbestrol premix, and the cattle were fed by Brookover Feedyards Co.

bestrol from the feed during normal-length fattening periods would be beneficial.

2. Stilbestrol did not produce high tailheads, weak loins, or other undesirable effects in this experiment.

3. Shrink to market was greater with animals fed stilbestrol throughout the test; however, it was lower for those fed stilbestrol only 56 days.

4. There were no differences in dressing percentages; however, animals fed stilbestrol showed a greater 48-hour cooler shrink.

5. Liver weights were greater for animals fed stilbestrol.

6. There were no significant differences in carcass grade, degree of marbling, size of rib-eye, fat thickness over the 12th rib, color and degree of firmness; however, it was observed that there was a tendency for greater "leakage" or oozing of fluid in carcasses when ribbed from animals fed stilbestrol.

Table 37

Results with and without Stilbestrol in Fattening Ration of Beef Steers.
June 2, 1955, to September 10, 1955—100 days.

Lot	10 milligrams	Control	10 milligrams
	stilbestrol		stilbestrol fed
	4	5	6
			56 days and discontinued
Number steers per lot	75	74	73
Total starting weight, lbs.	61985	61256	59038
Av. starting weight, lbs.	826.5	827.8	808.7
Total final weight			
(Garden City), lbs.	84265	80705	79260
Av. final weight, lbs.	1123.5	1090.61	1085.73
Total gain, lbs.	22280	19449	20222
Av. gain per steer, lbs.	297.06	262.82	277.01
Days on experiment	100	100	100
Av. daily gain, lbs.	2.97	2.63	2.77
Total final weight			
(Ok. City), lbs.	79450	76570	75450
Av. final weight			
(Ok. City), lbs.	1059.3	1034.7	1033.5
Total lbs. shrink to market..	4815	4135	3810
Av. lbs. shrink to market	64.20	55.87	52.19
% shrink to market	5.71	5.12	4.81
Total hot dressed wt., lbs. ..	51455	49515	48616
Av. hot weight, lbs.	686.06	669.12	665.97
Dressing % (hot wt.)	64.76	64.67	64.43
Total 48-hr. chilled wt., lbs. ..	50327	48468	47575
Av. 48-hr. chilled wt., lbs.	671.02	654.97	651.71
Dressing % (chilled wt.)	63.34	63.30	63.06
Total 48-hr. shrink, lbs.	1128	1047	1041
Av. 48-hr. shrink, lbs.	15.04	14.15	14.26
% 48-hr. cooler shrink	2.19	2.11	2.14
48-hr. diff. in shrink (based on control), lbs.	+ .89		+ .11
Av. liver weight, lbs.	16.83	15.57	16.24
Av. carcass grade before ribbing ¹	13.60	13.89	14.36
Av. carcass grade after ribbing ²	13.63	14.00	14.08
Number carcasses upgraded	26	20	27
Number carcasses downgraded	28	20	21
Av. fat thickness over 12th rib, cm.	1.59	1.67	1.59
Av. degree of marbling ³	6.15	6.38	6.40
Av. size of rib-eye, sq. in.	11.66	11.64	11.53