

**Table 36**  
Daily Gain per Heifer by Periods, Chronologically, for Spayed and Nonspayed Heifers.

Lot number .....	Spayed lbs. per day	Nonspayed 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-550<sup>1</sup>

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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-

<sup>1</sup> 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 stilbestrol	Control	10 milligrams stilbestrol fed 56 days and discontinued
	4	5	6
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 <sup>1</sup> .....	13.60	13.89	14.36
Av. carcass grade after ribbing <sup>2</sup> .....	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 <sup>3</sup> .....	6.15	6.38	6.40
Av. size of rib-eye, sq. in. ....	11.66	11.64	11.53

Table 37 (Continued).

Av. color .....	A 4.12	A 4.34	A 4.23
Av. firmness <sup>4</sup> .....	4.08	4.04	4.07
U.S. grades:			
Choice .....	33	29	29
Good .....	40	44	42
Commercial .....	2	1	2
Av. daily ration, lbs.:			
Alfalfa hay .....	1.45	1.41	1.42
Sorghum silage .....	4.47	4.48	4.40
Cottonseed meal .....	0.95	0.95	0.97
Milo grain .....	18.71	19.00	18.14
Molasses feed .....	1.97	1.98	1.98
Alfalfa pellets .....	.41	.42	.41
Molasses .....	.55	.63	.81
Stilbestrol feed .....	1.04		.62
Lbs. feed per 100 lbs. gain:			
Alfalfa hay .....	48.7	53.4	51.1
Sorghum silage .....	150.5	170.5	158.8
Cottonseed meal .....	32.0	36.2	34.9
Milo grain .....	629.7	723.1	654.9
Molasses feed .....	66.2	75.4	71.4
Alfalfa pellets .....	13.9	16.1	14.6
Molasses .....	18.5	24.0	29.1
Stilbestrol feed .....	34.8		22.2
Total feed .....	994.3	1098.7	1037.0
Feed cost per 100 lbs. gain <sup>5</sup> ..	\$20.23	\$22.02	\$20.92

1. Carcass data obtained through courtesy of Raymond A. Fowler, district supervisor, USDA Grading Service, Oklahoma City.

2. Carcass grade based on top choice, 8; av. choice, 10; low choice, 12; top good, 14; or good, 16; low good, 18; top commercial, 20.

3. Based on moderately abundant, 3; slightly abundant, 4; moderate, 5; modest, 6; small amount, 7; slight amount, 8; traces, 9.

4. Based on very firm, 1; firm, 2; moderately firm, 3; modestly firm, 4; slightly soft, 5; soft, 6.

5. Based upon following prices: Alfalfa hay, \$25 per T.; sorghum silage, \$9 per T.; cottonseed meal, \$68 per T.; milo grain, \$2.35 cwt.; molasses feed, \$2.10 cwt.; alfalfa pellets, \$2.15 cwt.; molasses, \$1.80 cwt.; and stilbestrol feed, \$2.95 cwt.

#### General Observations on Feeding Stilbestrol to Beef Cattle.

##### By Animal Husbandry Staff

There are obviously many factors that influence the response obtained from feeding stilbestrol to beef cattle. A survey of the results indicates some variations; however, the following general observations seem appropriate at this time:

1. **Age**—Rate of gain and feed efficiency seem to be greater with older animals than with animals about 1 year or less in age. One finds it more difficult to improve the natural gaining ability of young animals that are being properly fed.

2. **Weight**—Since weight usually expresses maturity, it is an important factor. Heavier animals, assuming they are not already fleshy, usually give a greater response.

3. **Sex**—The rate of gain is usually increased with heifers; however, the amount and consistency of gains seem to be greater with steers. Preliminary results indicate little difference between open and spayed heifers.

4. **Estrogenic content of feed**—Natural estrogens or hormonelike substances are found in our natural feedstuffs. The amount appears not only to vary from one kind of feedstuff to another but also within the same kind of feedstuff. This fact played an important role in the development of feeding stilbestrol and other hormonelike substances.

It is also highly probable that this fact largely explains differences obtained in feeding stilbestrol.

5. **Kind of ration**—It is obvious that the greatest response is obtained with a high-energy, fattening-type ration. There is a tendency for greater gains on a wintering ration, but it is extremely doubtful that this is a good practice.

6. **On pasture**—Both good and adverse results have been reported. This certainly appears to be a doubtful practice in a strictly grazing program. It may have possibilities where cattle are being fed a fattening ration on grass.

7. **Length of feeding period**—There seems to be no benefit from feeding stilbestrol over a longer time than normal fattening periods. In fact, most results indicate that more benefit is obtained in 50 to 60 days after the animals are on feed than at any other time. One might reason that the body adjusts itself to the intake of this hormonelike substance. It is not desirable to remove stilbestrol from the feed during the fattening period.

8. **Digestion**—Available data indicate that stilbestrol has no beneficial effect upon digestion but may cause increased nitrogen retention. Therefore, it is logical to assume that other factor(s) is (are) responsible for the increased rate and efficiency of gain.

9. **Shrink (a) To market**—Data on this subject do not agree; more information would be helpful. There seems to be a tendency for greater shrink with animals fed stilbestrol; however, it should be recognized that differences, if any, are small. (b) **Cooler shrink**—Here again the differences are small; however, there is a slight tendency for carcasses of animals fed stilbestrol to shrink slightly more in the cooler.

10. **Carcass quality**—It is apparent that feeding stilbestrol to older, heavier cattle in the fattening ration, as approved, has little effect upon carcass quality. If it has any effect on the carcass, it tends to lower the grade. This seems to be more nearly true with younger cattle and those fed stilbestrol over unusually long periods. If the grade is affected, it seems to be brought about by less marbling and more free fluid in the meat.

11. **Side effects**—High tailheads, weakened loins, increased teat length, and other minor effects have been observed. Under proper feeding conditions as approved these are of no practical significance.

12. **Cooking**—Cooking data do not reveal any significant differences in cooked roasts from animals fed stilbestrol compared with animals that did not receive stilbestrol.

13. **Rate of gain and cost**—Results indicate that the only economically desirable place to feed stilbestrol is in the fattening ration of older animals. Increasing rate of gain more than 0.15 pound per day and increased feed efficiency should result in a profit to the feeder.

14. **Residue in meat and gastro-intestinal tract**—Present means of testing indicate that there is no residue of stilbestrol in the meat or gastro-intestinal tract.

15. **Swine in feed lot with cattle**—Results to date indicate that breeding, gestation, and farrowing of swine are not affected by following beef cattle receiving stilbestrol in the feed lot.

16. **Effect upon breeding animals**—Animals to be used for breeding purposes should not receive stilbestrol.

#### Sources of Phosphorus for Wintering Beef Heifer Calves in Dry Lot. PROJECT 536<sup>2</sup>

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In a previous test, it was found that phosphoric acid could be used as a source of phosphorus for beef heifers on dry bluestem pasture.

1. This project was in cooperation with Westvaco Mineral Products Division, Food Machinery and Chemical Corporation, New York 17, N.Y.

2. Ground corn cobs used in this test were supplied by John Clay, John Clay Sales Company, Kansas City, Mo.