

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>1</sup>

D. Richardson, E. F. Smith, C. S. Menzies, and R. F. Cox

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.

A phosphorus balance study with lambs also indicated efficient utilization of phosphorus from phosphoric acid. This test was conducted to further evaluate phosphoric acid as a source of phosphorus in the wintering ration of beef calves in dry lot.

#### Experimental Procedure

Seventy-four Hereford heifer calves were divided into five lots as equally as possible on the basis of weight and type. Lot 12, which served as the control lot, contained 10 animals and the others 16 animals each.

The control ration consisted of  $\frac{3}{4}$  pound of soybean oil meal,  $\frac{1}{2}$  pound of dehydrated alfalfa meal, 2 pounds of dehydrated ammoniated hydrol product (Dex-Mo-Lass made with ammoniated hydrol), and all of a corncob-blackstrap molasses mixture that the animals would clean up each day. The corncob-molasses mixture contained approximately 22 percent molasses for the first 84 days. It was then increased to 40-45 percent molasses. When the molasses concentration was increased,  $1\frac{1}{2}$  percent each of ground limestone and salt was added to retard "setting up" of the mixture. The limestone was decreased to  $\frac{3}{4}$  of 1 percent after about 30 days. The soybean oil meal and dehydrated alfalfa meal were made into pellets containing approximately 10 percent molasses. The added phosphorus was put in these pellets in the form of phosphoric acid or steamed bonemeal. A mixture of ground limestone and salt and salt alone were available to all animals free choice.

The control ration supplied approximately 6 grams of phosphorus per head per day. This is one-half of the National Research Council recommendation of 12 grams per head per day. Source and amount of phosphorus in the ration was the only variation. The treatments were as follows, which indicate the amount of added phosphorus per head per day:

Lot 12—Control ration.

Lot 13—Control ration + 3 grams phosphorus from phosphoric acid.

Lot 14—Control ration + 6 grams phosphorus from phosphoric acid.

Lot 15—Control ration + 3 grams phosphorus from steamed bonemeal.

Lot 16—Control ration + 6 grams phosphorus from steamed bonemeal.

Blood samples will be taken at the end of the experiment to determine serum phosphorus and calcium levels.

#### Results and Discussion

The feed-lot results are presented in Table 38. The reader should recognize that the experimental ration used in this test was designed to contain a low amount of phosphorus. Therefore, the roughage and source of energy had to be from ingredients low in phosphorus. There was considerable variation from time to time in consumption of the corncob-molasses mixture; however, no difficulty was experienced in keeping the animals on feed. After increasing the percentage of molasses, the animals were getting approximately 1 pound of molasses per 100 pounds body weight. Trouble with scouring was observed when the consumption of molasses exceeded this amount.

#### Observations

1. No harmful or ill effects of any kind were observed from feeding phosphoric acid as a source of phosphorus.

2. No deficiency symptoms, phosphorus, vitamin A, etc., were observed. Animals in all lots gnawed on the fence; however, there were no differences among lots.

3. Feed containing phosphoric acid was highly palatable and the total consumption tended to be greater.

4. Rate of gain and feed efficiency increased as the level of phosphorus was increased. There was no difference between steamed bone-

meal and phosphoric acid as a source of phosphorus at the higher level; however, phosphoric acid tended to be more efficient at the lower level.

**Table 38**  
**Sources of Phosphorus for Beef Heifer Calves.**  
November 9, 1955, to April 11, 1956—154 days.

Lot number .....	12	13	14	15	16
		3 gm. from phos. acid	6 gm. from phos. acid	3 gm. from steamed bonemeal	6 gm. from steamed bonemeal
Added phosphorus .....	None				
Number heifers per lot .....	10	16	16	16	16 <sup>1</sup>
Av. initial wt., lbs. ....	441	442	440	441	442
Av. final wt., lbs. ....	603	612	623	606	624
Av. total gain, lbs. ....	162	170	183	165	182
Av. daily gain, lbs. ....	1.05	1.11	1.18	1.07	1.18
Av. daily ration, lbs.:					
Corncob-molasses mixture ....	9.02	10.37	10.03	9.87	9.80
Soybean oil meal-dehydrated					
alfalfa pellets .....	1.30	1.30	1.30	1.30	1.30
Dehydrated am. hydrol					
product .....	2.00	2.00	2.00	2.00	2.00
Limestone and salt .....	.03	.02	.02	.02	.02
Salt .....	.05	.04	.02	.04	.03
Lbs. feed per 100 lbs. gain:					
Corncob-molasses mixture ....	857.7	939.8	844.1	921.0	828.8
Soybean oil meal-dehydrated					
alfalfa pellets .....	123.5	118.8	110.4	122.4	111.0
Dehydrated am. hydrol					
product .....	190.1	181.2	168.3	186.7	169.2
Limestone and salt .....	2.6	1.8	1.7	1.9	1.4
Salt .....	5.1	3.8	1.7	3.7	2.6

1. Data on 15 animals, one sick animal removed.

#### The Value of Ammoniated Hydrol in Beef Cattle Wintering Rations, 1955-56.

PROJECT 537<sup>1</sup>

D. Richardson, E. F. Smith, and R. F. Cox

This is the second test in an experiment to determine the value of ammoniated hydrol (corn molasses) in the wintering ration of beef heifer calves.

#### Experimental Procedure

Thirty Hereford heifer calves averaging about 400 pounds each were divided as equally as possible into three lots of 10 animals each. All lots received all the sorghum silage they would clean up each day. A mineral mixture of equal parts steamed bonemeal and salt and salt alone were fed free choice. Other ingredients, which varied in the different rations, were as follows:

Lot 1—Control, 1 pound soybean oil meal + 3 pounds milo grain.

Lot 2—Two pounds dehydrated ammoniated hydrol product + 2 pounds milo grain.

Lot 3—0.6 pound soybean oil meal, 2 pounds liquid ammoniated hydrol, and 1.9 pounds milo grain.

All rations were calculated to contain approximately the same amount of protein equivalent and total digestible nutrients. The liquid ammoniated hydrol contained 14.4 percent protein equivalent and the dehydrated ammoniated hydrol product contained 21.2 percent protein

1. This project was partially supported by Clinton Foods, Inc., Clinton, Iowa.