

Table 44 (Continued).

| | | |
|--------------------------------------|------|-------|
| Ammoniated hydrol | | 1.77* |
| Steamed bone meal and salt mix | 0.12 | .13 |
| Salt | 0.10 | .05 |
| Feed per 100 lbs. gain, lbs.: | | |
| Sorghum silage | 1900 | 1998 |
| Ground milo grain | 129 | 77.7 |
| Soybean oil meal | 64.5 | 46.4 |
| Ammoniated hydrol | | 131.4 |
| Steamed bone meal and salt mix | 7.4 | 9.3 |
| Salt | 6.1 | 3.4 |

* There was a two-week period in which ammoniated hydrol was not fed.

Sources of Phosphorus for Wintering Beef Heifer Calves on Dry Bluestem Pasture

PROJECT 536*

D. Richardson, F. H. Baker, C. S. Menzies, and R. F. Cox

Roughages generally provide more calcium than phosphorus. There is usually sufficient calcium in a high roughage ration but additional phosphorus is needed. Present ingredients used to supply phosphorus also supply calcium in as great or greater quantities. It would be desirable to have an ingredient to supply phosphorus without having to add other elements not needed in the ration. This experiment was planned to determine whether or not phosphoric acid could be used as a source of phosphorus and, if so, the efficiency of utilization.

Experimental Procedure

Forty head of choice-quality Hereford heifer calves were divided into four lots of 10 animals each on the basis of weight and type. Each animal was branded with an individual number and lot number. All animals grazed together on dry bluestem grass and were divided each day to receive their respective supplemental feed. Prairie hay was fed when snow covered the grass. The prairie hay averaged 1.67 pounds per head daily for the entire time of the experiment. Water and salt were available at all times. The supplement fed per head daily was as follows:

- Lot 1—1.5 pounds soybean meal and 0.2 pound blackstrap molasses.
- Lot 2—1.5 pounds soybean meal, 0.2 pound blackstrap molasses, and 8 grams of phosphorus from steamed bone meal.
- Lot 3—1.5 pounds soybean meal, 0.2 pound blackstrap molasses, and 8 grams of phosphorus from phosphoric acid.
- Lot 4—1.5 pounds soybean meal, 0.2 pound blackstrap molasses, and 4 grams of phosphorus from phosphoric acid.

The phosphoric acid was mixed with the blackstrap molasses and then added to the soybean meal in the mixer. The ingredients were mixed in a mechanical mixer. The supplement was fed as a meal in bunks.

Weights were taken every 28 days. Blood serum phosphorus was determined to measure phosphorus utilization. These animals will continue on grass until sometime in July. After the grazing season, they will be placed in dry lot and fed to grade choice.

Results

Growth results are presented in Table 45. The gains were not so

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

good as might be expected; however, it should be pointed out that the calves were in fleshy condition at the beginning of the experiment and the grass was covered by snow a good part of the time.

Blood samples were taken to determine the serum phosphorus levels. The dates taken and average results of these tests are shown in Table 46. It required two days to collect the blood because of laboratory facilities. It is obvious, as shown by the figures for November 16 and 17, that some error was made on one of the days of the first collection. One-half of the animals were bled on each of the two days for the other tests to equalize any error that might be made.

Observations

1. The supplements containing phosphoric acid were highly palatable. They seemed to be more palatable than the other supplements.
2. No harmful or ill effects of any kind were observed.
3. There was a definite lowering of serum phosphorus in Lot 1 which did not receive any supplemental phosphorus.
4. The serum phosphorus levels of Lots 2, 3, and 4 remained practically the same throughout the test. The values in these lots are considered normal.
5. Weight gains and serum phosphorus levels indicate that 4 grams of additional phosphorus are as efficient as 8 grams.

Table 45.—Sources of phosphorus for beef heifer calves on dry bluestem pasture.

(Nov. 17, 1954-April 6, 1955—140 days)

| Lot | 1 | 2 | 3 | 4 |
|------------------------------|-------|--------------------------------|------------------------------|------------------------------|
| | | 8 grams from steamed bone meal | 8 grams from phosphoric acid | 4 grams from phosphoric acid |
| Added phosphorus | None | | | |
| Number heifers per lot | 10 | 10 | 10 | 10 |
| Av. initial wt., lbs. | 515.5 | 517.0 | 515.5 | 516.5 |
| Av. final wt., lbs. | 560.0 | 566.7 | 561.0 | 574.0 |
| Av. gain, lbs. | 44.5 | 49.7 | 45.5 | 57.5 |
| Av. daily gain, lbs. | .32 | .36 | .33 | .41 |

Table 46.—Average serum phosphorus levels.*

| Lot | 1 | 2 | 3 | 4 |
|--------------------------|------|------|-------|-------|
| November 16 and 17 | 8.93 | 8.53 | 10.51 | 10.36 |
| February 16 and 17 | 6.12 | 8.61 | 8.79 | 8.42 |
| March 22 and 23 | 6.83 | 9.55 | 10.08 | 9.44 |

* Figures are expressed as milligrams percent.

The Performance of Phenothiazine-treated Cattle.

PROJECT 370

W. A. Moyer, F. H. Baker, D. S. Folse, E. F. Smith, and R. F. Cox

Cattlemen, in recent years, have become interested in internal parasites and their control. A large number of cattle, particularly replacement calves and yearlings, move into Kansas from the Southwest each year. The level of parasitism of these cattle and the possible effect of control measures pose as questions in the minds of many cattlemen. These experiments were designed to study the level of parasitism in feeder calves and the effect of phenothiazine treatment.

Experimental Procedure

The first experiment was conducted during the winter of 1953-54 with 60 heifer calves. The heifers were raised near Snyder, Texas, and delivered to Manhattan, December 1, 1953. The heifers were assigned December 17, 1953, as lots of 10 to a series of wintering experiments. The level of parasitism was established during the last two weeks of December. Fecal samples were collected and E.P.G. (egg per gram) counts were made on the composite fecal samples from each lot. Five heifers in each lot were treated with 60 grams (two 30-gram boluses) of phenothiazine on January 14, 1954.

A second experiment using this same procedure was conducted during the winter of 1954-55, with 70 steer calves that originated in Barber county, Kansas.

The results of the two experiments are shown in Table 47.

Table 47.—Effect of phenothiazine treatment on the gains of young beef cattle fed wintering rations.

| Year | 1953-54 | | 1954-55 | |
|---------------------------------|---------|-------------|---------|-------------|
| | Treated | Non-treated | Treated | Non-treated |
| Length of experiment, days | 137 | 137 | 140 | 140 |
| Number of cattle | 30* | 30* | 35** | 35** |
| Av. initial wt., lbs. | 310 | 312 | 454 | 456 |
| Av. final wt., lbs. | 491 | 487 | 718 | 721 |
| Av. total gain, lbs. | 181 | 175 | 264 | 265 |
| Av. daily gain, lbs. | 1.31 | 1.27 | 1.88 | 1.89 |

* Heifers.

** Steers.

Observations

Beef calves used in this experiment were typical of replacement calves used on many farms and ranches of Kansas. The average initial E.P.G. count of the heifers used in the first test was 156 as compared to 17 for the steers used in the second test. An E.P.G. count of 300 to 500 is considered to be detrimental or harmful to the animal.

The weight gains of the phenothiazine-treated heifers in the first test were 6 pounds more per head than those of the non-treated heifers, whereas in the second test the treated steers gained 1 pound less than the non-treated steers. The difference in gain was not statistically significant in either test.

Phenothiazine treatment of beef calves in Kansas is unwarranted unless the degree of parasitism is higher than it was in the cattle used in these experiments.

The Value of Stilbestrol* in Beef Cattle Rations, Wintering Phase.

PROJECT 370

D. Richardson, F. H. Baker, D. L. Good, and R. F. Cox

Stilbestrol has been recognized as a growth-stimulating factor in beef cattle-fattening rations. It is a synthetic compound that has a hormone-like effect when taken into the body.

This experiment was designed to determine the value of stilbestrol (1) in the wintering ration of beef calves, (2) during grazing, (3) when animals return to the feed lot after grazing, (4) effect of removing stilbestrol from the animals while grazing, (5) effect from long-time continuous feeding, (6) effect upon digestibility of feed, and (7) car-

* Stilbestrol (shortened name for diethylstilbestrol) premix was supplied by the Eli Lilly Company, Indianapolis 6, Ind.

cass grade. This report gives information on the wintering phase (1) and the digestibility (6) studies.

Experimental Procedure

Forty Hereford steer calves averaging about 450 pounds were divided as equally as possible into four lots of 10 animals each. Two lots served as controls and the other two lots received 10 mg. of stilbestrol per head daily in the soybean meal. Ten Hereford heifer calves averaging about 335 pounds were divided as equally as possible into two lots of five animals each. One served as control and the other received 10 mg. of stilbestrol per head daily in the soybean meal. Atlas sorghum silage was used as the roughage in all lots and the animals received all they would clean up each day. The concentrate part of the ration consisted of 1 pound of soybean meal and 4 pounds of ground milo grain for all lots. A mineral mixture of 2 parts steamed bone meal and 1 part salt and salt were fed free choice. Water was available at all times.

Eleven yearling Hereford steers were used in the digestion study. The ration used was chopped alfalfa hay and cracked milo grain fed at a ratio of 1 part hay to 3 parts grain. The study was made with all steers and then repeated with stilbestrol. Thus, each animal served as his own control. The stilbestrol was fed at the rate of 10 mg. per head daily. The steers were fed in stanchions, and canvas collection bags were used to collect the feces for chemical analyses.

Results and Discussion

Feed lot results for the steers are shown in Table 48, and for the heifers in Table 49. Note that there is a little variation between lots; however, there are no significant differences. Table 50 gives a summary of the digestion study. There was a consistent lowering of digestibility when stilbestrol was added to the ration. These differences are statistically significant. The economic or practical significance of these findings cannot be stated at this time. However, with increased gains on fattening rations and apparently lowered digestibility of the feed, further investigations seem to be warranted.

Many animals, both steers and heifers, developed high tailheads and weak backs in the region of the loin. Here again, the practical significance of these results is not known at this time.

Table 48.—Results with and without stilbestrol in the wintering ration of beef steer calves.

(Nov. 16, 1954-April 5, 1955—140 days)

| | | | | |
|----------------------------------|---------|---------|---------|---------|
| Lot number | 10 | 15 | 11* | 12* |
| Number steers per lot | 10 | 10 | 10 | 10 |
| Av. initial wt., lbs. | 454 | 457 | 456 | 455 |
| Av. final wt., lbs. | 723 | 714 | 723 | 729 |
| Av. total gain, lbs. | 269 | 257 | 267 | 274 |
| Av. daily gain, lbs. | 1.92 | 1.84 | 1.91 | 1.96 |
| Av. daily ration, lbs.: | | | | |
| Soybean meal | 1.00 | 1.00 | 1.00 | 1.00 |
| Ground milo | 4.00 | 4.00 | 4.00 | 4.00 |
| Atlas sorgho silage | 29.05 | 29.04 | 28.94 | 29.05 |
| Salt | .10 | .11 | .13 | .13 |
| Mineral (bone meal + salt) | .09 | .10 | .09 | .09 |
| Lbs. feed per 100 lbs. gain: | | | | |
| Soybean meal | 52.12 | 54.45 | 52.43 | 51.13 |
| Ground milo | 208.49 | 217.81 | 209.74 | 204.53 |
| Atlas sorgho silage | 1514.89 | 1581.09 | 1517.60 | 1485.57 |
| Salt | 5.14 | 5.72 | 6.62 | 6.87 |
| Mineral | 4.80 | 5.60 | 4.83 | 5.08 |
| Feed cost per 100 lbs. gain | \$13.38 | \$13.99 | \$13.86 | \$13.56 |

* Received 10 mg. of stilbestrol in soybean oil meal per head daily. Cost figured at .08c per mg. or .8c per head daily.