

It is planned to pasture-mate the heifers, starting May 1, 1957, so that they will calve first in 1958 as two-year-olds. Again in the winter of 1957-58 the extent of body weight gain or loss will be controlled by varying the levels of supplemental feed.

Summary

The results of the eighth consecutive year in a long-time project at the Ft. Reno station on the effects of low, medium, and high levels of supplemental feed on the performance of range beef cows are presented. Data obtained indicate a slight effect of level of winter feed on mature body weight of the cows, but no significant difference in percentage calf crop weaned or average corrected weaning weight of the calves. The cost per cwt. of calf weaned has been least for those cows wintered at the low-level, and has been less for those calving first as two-year-olds than for the cows calving first as three-year-olds. The test with the original cows is now in its ninth consecutive year.

Three repetitions are now in progress with heifers from the experimental herd. Body weight was affected somewhat in all trials by level of winter feeding; however, summer gains have tended to compensate for differences in winter gain. Weaning weights of calves from the second trial were directly proportional to the level of winter feed, but the differences in weaning weight were not great enough to pay for the extra feed cost of the medium and high levels. Calving difficulty was least for the low-level lots in the second trial, but was about equal for all lots in the third trial. In the third and fourth replications an attempt is being made to establish the total amount of winter gain of the heifers by adjustments in the amount of supplemental feed.

Mineral and Management Studies With Beef Cows In Southern Oklahoma

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Experiments at the Wilburton Station from 1947 to 1951 clearly demonstrated that the forage in that area is frequently deficient in phosphorus and that a phosphorus supplement must be provided for best results. For example, the feeding of 26 pounds of dicalcium phosphate per head during a period of 21 months increased the weight of heifers 166 pounds. However, the performance of reproducing cows as measured by the number of calves produced and the weaning weight of the calves was very poor even with supplemental phosphorus. Several suggestions regarding the possible causes of poor performance were (1) insufficient phosphorus intake during the summer due to a low consumption of mineral mix; (2) deficiency of trace minerals; (3) internal parasites; and (4) lack of shade during the hot summer months.

To test some of the suggested causes of reproductive failures, the present experiment was started at Wilburton in the fall of 1951. Results of the first, second, third and fourth years' work were reported in the 1953, 1954, 1955 and 1956 Feeders' Day Reports. The fifth year's work (November 1955-October 1956) is summarized here.

Description of the Experiment

At the start of the experiment in 1951, sixty 2-year-old grade Hereford heifers were divided into 6 lots of 10 head each. Lots 2 and 5 had 8 and 9 head, respectively, at the conclusion of the fifth year. The cattle had access to native grass pasture year-long.

During the past year Lots 1 and 4 were offered free-choice a mineral mix of 2 parts salt and 1 part bonemeal; they consumed a relatively low amount of supplemental phosphorus. Lots 2 and 5 were offered free-choice a mineral mix of 2 parts bonemeal and 1 part salt with a small amount (5-15 percent) of cottonseed meal added to increase palatability; they consumed a relatively high amount of supplemental phosphorus.

Lots 3 and 6 also were offered a high level of phosphorus in the same manner as Lots 2 and 5 and in addition the trace minerals iron, copper, cobalt and iodine. The trace minerals were fed in the mineral mix. These mineral mixes were fed both winter and summer.

During the winter, Lots 1, 2 and 3 were fed a constant level of 2.5 pounds of cottonseed cake per head daily. Lots 4, 5 and 6 were fed an increasing level of cottonseed cake as the winter progressed. The level was gradually increased from 1.5 pounds initially to 3.5 pounds during late winter after most of the cows had calved.

One-half of the cows and calves in each lot were drenched with phenothiazine at approximately 2 month intervals to determine the value of treating the cattle for internal parasites.

One-half of the cows in each lot were bled at intervals during the year for the determination of blood plasma phosphorus, hemoglobin and red blood cells.

Observations

High Phosphorus Supplementation

The comparison of a low and a high level of supplemental phosphorus intake is shown in Table 1. Compare Lots 1 and 4 with Lots 2 and 5.

Cows of Lots 2 and 5, which received the mineral mix of 2 parts bonemeal and 1 part salt with cottonseed meal added, consumed about 4 times more phosphorus during the year than cows in Lots 1 and 4, which were offered the mineral mix of 2 parts salt and 1 part bonemeal. The calves in Lots 2 and 5 weighed 22 pounds more at weaning than calves in Lots 1 and 4. A similar difference in weaning weight was noted the previous 2 years. Although differences in the performance of the cows have been small, it appears that a level of phosphorus supplementation above the amount furnished by a simple mineral mix of 2 parts salt and 1 part bonemeal may be of some value in southeastern Oklahoma.

The low-phosphorus cows lost more weight during the year than the high-phosphorus cows. This was reverse from the previous 2 years when the weight changes were in favor of the low-phosphorus cows. These weight fluctuations are probably within the range that can be

Table 1.—The effect of level of supplemental phosphorus intake and trace minerals on cows and calves, 1955-56.

| | Constant Protein Supplement | | | Increasing Protein Supplement | | |
|--|-----------------------------|---------------------------|--|-------------------------------|---------------------------|--|
| | 1 Low Phos- phorus | 2 High Phos- phorus | 3 High Phos- phorus Trace Minerals | 4 Low Phos- phorus | 5 High Phos- phorus | 6 High Phos- phorus Trace Minerals |
| No. cows per lot..... | 10 | 9 ¹ | 10 | 10 | 9 | 10 |
| Av. weight per cow (lb.)..... | | | | | | |
| Initial 11-16-55..... | 1184 | 1136 | 1117 | 1188 | 1070 | 1119 |
| End of winter 4-17-56..... | 1006 | 1030 | 1018 | 1092 | 944 | 1040 |
| Final 10-11-56..... | 1058 | 1082 | 1089 | 1083 | 1062 | 1114 |
| Weight gain or loss (lb.)..... | | | | | | |
| Winter..... | -178 | -106 | -99 | -96 | -126 | -79 |
| Summer..... | 52 | 52 | 71 | -9 | 118 | 74 |
| Yearly..... | -126 | -54 | -28 | -105 | -8 | -5 |
| Av. birth weight of calves (lb.) ² | 77 | 75 | 75 | 73 | 75 | 76 |
| No. of cows open..... | 0 | 0 | 1 | 0 | 0 | 3 |
| No. calves weaned ³ | 9 | 7 ¹ | 9 | 9 | 9 | 7 |
| Corrected weaning wt. of calves (lb.) ⁴ | 459 | 484 | 473 | 470 | 490 | 487 ⁵ |

¹One cow apparently killed by lightning 3 months after calving, calf sold.

²Corrected for sex by adding 5 pounds to the actual birth weight of each heifer.

³Death loss record of calves.

 Lot 1—calf died 7 days after birth, cause unknown.

 Lot 2—1 calf died at calving.

 Lot 4—1 calf died after apparently receiving phenothiazine too young.

⁴Corrected for age by adjusting all calves to a standard age of 210 days, and for sex by adding 25 pounds to the age corrected weight of each heifer.

⁵One calf in Lot 6 was sick continuously following birth and was not included in the weaning weight average.

normally expected among relatively small lots of range beef cows, and may not be related to the experimental treatments to any important extent.

Trace Minerals

The influence of feeding trace minerals is indicated in Table 1. Compare Lots 2 and 5 with Lots 3 and 6.

No important differences in weight and appearance of the cows and in the weaning weight of the calves were noted. This agrees with results obtained in three previous years. This experiment has not indicated a need for the feeding of trace minerals.

Phenothiazine Drenching

The effect of drenching cows and calves with phenothiazine is shown in Table 2. Phenothiazine did not greatly influence the weight or appearance of either the cows or calves. Fecal samples taken from cows and calves in October and examined for worm eggs indicated only a light infestation of internal parasites in all groups. Internal parasites have been no problem among the cattle in this experiment and drenching with phenothiazine has not produced any beneficial results.

Table 2.—The effect of drenching cows and calves with phenothiazine, 1955-56.

| | No Phenothiazine (one-half of the cows and calves in each lot) | Phenothiazine (one-half of the cows and calves in each lot) |
|--|--|---|
| No. of cows | 29 | 29 ¹ |
| Av. weight of cows, lbs. | | |
| Initial 11-16-55 | 1122 | 1154 |
| End winter 4-17-56 | 998 | 1048 |
| Final 10-11-56 | 1062 | 1102 |
| Production of cows | | |
| Av. Birth wt. (lbs.) ² | 75 | 76 |
| No. calves weaned | 27 | 23 |
| Av. weaning weight (lbs.) ³ | 477 | 475 ⁴ |

¹One cow apparently killed by lightning 3 months after calving, calf sold.

²Corrected for sex by adding 5 pounds to the actual birth weight of each heifer.

³Corrected for age by adjusting all calves to a standard age of 210 days, and for sex by adding 25 pounds to the age corrected weight of each heifer.

⁴One calf was sick continuously following birth and was not included in the weaning weight average.

Some difficulty was encountered when phenothiazine was administered to calves less than 2 weeks old. One calf died and 4 calves developed blindness in one or both eyes. This type of difficulty was not noted previously in this experiment; in actual practice calves are not dosed with phenothiazine at such a young age.

Distribution of Protein

The influence of increasing the protein intake of cows as the winter progresses is indicated in Table 3.

Table 3.—The effect of increasing the protein intake of cows during the winter (1955-56).

| | Constant Protein Level (Lots 1, 2 and 3) | Increasing Protein Level (Lots 4, 5 and 6) |
|-------------------------------------|---|---|
| No. of cows | 29 ¹ | 29 |
| Av. weight of cows, lbs. | | |
| Initial 11-16-55 | 1146 | 1164 |
| End winter 4-17-56 | 1018 | 1060 |
| Final 10-11-56 | 1076 | 1087 |
| Production of cows | | |
| Av. birth wt. (lbs.) ² | 76 | 74 |
| No. calves weaned | 25 | 25 |
| Av. weaning wt. (lbs.) ³ | 471 | 476 |

¹One cow apparently killed by lightning 3 months after calving, calf sold.

²Corrected for sex by adding 5 pounds to the actual birth weight of each heifer.

³Corrected for age by adjusting all calves to a standard age of 210 days, and for sex by adding 25 pounds to the age corrected weight of each heifer.

A beef cow requires about 50 percent more protein when suckling a calf than when pregnant. The protein content of native range grass decreases during the fall and winter months. It would appear then that cows calving in late winter should receive more supplemental protein as the wintering period progresses.

All cows received approximately the same total amount of cottonseed cake during the winter. Lots 1, 2 and 3 received a constant level of 2.5 pounds per cow daily, while the level for Lots 4, 5 and 6 was increased at regular intervals from 1.5 to 3.5 pounds. The weight and condition of the cows, and the weaning weight of the calves, were not significantly affected. Different results might be expected under less satisfactory feeding conditions, or if cows went into the winter in a thinner condition than the cows in this experiment.

Moving Cows into Southeastern Oklahoma

In many instances where cows have been moved into southeastern Oklahoma from areas to the west, death losses have been high and performance has been poor. Several possible explanations have been offered. To study this problem, 12 cows were moved from Stillwater to the Wilburton area November 1, 1954. The weight and appearance of the cows have been satisfactory. The weaning weight of their 1955 and 1956 calves at Wilburton was comparable to the average of 4 previous years at Stillwater. It appears that with good feeding practices, and parasite control where necessary, difficulties can be avoided when cattle are moved into southeastern Oklahoma from areas to the west.

General Productivity of the Cows

The average performance of the entire group of cows at Wilburton for the past five years has been excellent regardless of experimental treatment. Year-long access to native grass, with adequate supplemental protein during the winter and adequate supplemental phosphorus year-long,

resulted in excellent production on a cow and calf program. There has been no indication of any limiting factor (s) for beef production during the last five years of this experiment. Therefore, this research in the Wilburton area has been terminated.

Summary

Results of studies with beef cattle at the Range Cattle Minerals Station near Wilburton for the year 1955-56 may be summarized as follows:

1. Cows with access to a palatable mineral mix containing cottonseed meal consumed 4 times more phosphorus and weaned slightly heavier calves than cows with access to a simple mineral mix of salt and bone-meal.
2. Feeding trace minerals to cows had no apparent affect either on the cows or on their calves.
3. Drenching with phenothiazine had little effect on cows or calves. None of the cattle appeared to be infested with internal parasites to any important extent.
4. Increasing the amount of cottonseed cake from 1.5 to 3.5 pounds during the wintering period did not prove beneficial compared to feeding a constant amount of 2.5 pounds throughout the winter.
5. Cows moved from Stillwater to Wilburton performed satisfactorily during their second year at Wilburton.
6. The performance of all cattle at the Wilburton Station was very acceptable.

Methods of Management for the Small Commercial Herd Producing "Two-Way" Calves

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In general, the beef industry in Oklahoma has moved toward younger cattle and more intensified systems of production. Increased interest has developed in the production of fat slaughter calves as a means of obtaining a quick return from the cow herd. A strong market for fat calves exists in April, May and June—following the bulk of fed cattle and before grass cattle arrive. Many plain calves can be fattened sufficiently while on the cow and creep-feeder to produce a desirable light-weight carcass of 275 to 350 lbs. in the Good and Choice grades. The keen demand for calf carcasses by large chain stores has stimulated their production in many areas of the state.

Plain calves can often be handled profitably under this system. However, many producers with high-grade commercial herds are considering the possibility of developing "two-way" calves—with enough quality and finish to sell to either the feeder or packer. This necessitates fall-calving and creep feeding in order to obtain desirable weight and finish by the May and June market. Steer calves of good quality may find a strong early feeder market, while the heifers may sell best to the packer.

This report covers the third trial in a project on methods of management for the cow herd. Results of previous trials indicate that the