| | | | | |
|---|---|---|---|---|
| Bluestem grass ..... Prairie hay[1] ..... | ad lib | ad lib | ad lib | ad lib |
| 5. Av. initial weight ..... | 745 | 755 | 755 | 749 |
| 6. Av. final weight ..... | 757 | 806 | 769 | 775 |
| 7. Av. gain ..... | 12 | 51 | 14 | 26 |
| 8. Av. daily gain ..... | .08 | .34 | .09 | .17 |
| 9. Feed cost per steer for entire winter ..... | $ 20.94 | $ 28.94 | $ 20.38 | $ 20.56 |
| 10. Initial cost per steer at 25½c per pound ..... | $189.98 | $192.53 | $192.53 | $191.00 |
| 11. Initial cost per steer plus winter feed cost ..... | $210.92 | $221.47 | $212.91 | $211.56 |
| 12. Necessary selling price per cwt. to cover initial cost plus wintering cost ..... | $ 27.86 | $ 27.48 | $ 27.69 | $ 27.30 |
| 13. Appraised value per cwt. on May 6, 1949 ..... | $ 25.00 | $ 25.00 | $ 25.00 | $ 25.00 |

(1) All lots were fed Prairie hay when snow covered the grass. The total Prairie hay fed per steer is as follows: Lot 1, 318 lbs.; Lot 2, 300 lbs.; Lot 3, 156 lbs.; Lot 4, 276 lbs.

Feed prices: Cottonseed meal and Soybean Pellets, $75 per ton; Alfalfa hay, $20 per ton; Prairie hay, $15 per ton; Bluestem grass for winter 1948-49, $10 per head; Salt, $12 per ton.

### OBSERVATIONS

1. All steers in this test wintered in a strong thrifty condition.
2. The total winter gains were so small except in the case of Lot 2 that it is difficult to make comparisons of the different rations.
3. All lots gained in weight up to March 1 and all except Lot 4 showed heavy losses for the month of March; Lot 1 lost 67 pounds, Lot 2 lost 28 pounds and Lot 3 lost 58 pounds. All these losses were offset by heavy gains during the month of April.
4. Lot 2 which was self-fed the salt-cottonseed meal mixture consumed almost twice as much protein as was hand fed to Lot 4, the check lot. This probably accounts for the larger gain of this lot.
5. The limited information available indicates that the ability of a steer to consume large quantities of salt will vary with his age and weight. Under the conditions of this test with yearling steers weighing about 750 pounds it appears that it would require about 50 pounds of salt per 100 pounds of meal to limit the cottonseed meal consumption to two pounds or less per steer daily. No ill effects from the high salt consumption were observed.
6. Prairie hay was fed only when the grass was covered with snow.

### B—The Effect of Feeding a Protein Supplement During the Latter Part of the Grazing Season to Two-Year-Old Steers on Bluestem Pasture

The rate of gain made by steers on bluestem pasture during the first 75 to 90 days is difficult to improve on; however, as the season progresses past mid-summer the nutritive value of the grass, particularly its protein value, usually declines and along with it, cattle gains. The objective of this experiment is to find what effect the feeding of a protein supplement after mid-summer will have on cattle gains and condition. It is hoped that by starting the feeding at different times, the most opportune date to start feeding may be determined, if feeding is found worthwhile. The two-year-old steers used in this test were dry wintered steers and are the same steers that were used in the winter study last year, "A Comparison of Protein Supplements and Methods



of Feeding Protein Supplements to Yearling Steers Wintered on Bluestem Pasture".

### EXPERIMENTAL PROCEDURE

Lot 1—May 1 to July 18 - Bluestem pasture.
July 18 to October 10 - Bluestem pasture and 3 pounds of soybean pellets per head daily.
Lot 2—May 1 to August 10 - Bluestem pasture.
August 10 to October 10 - Bluestem pasture and 3 pounds of soybean pellets per head daily.
Lot 3—May 1 to September 1 - Bluestem pasture.
September 1 to October 10 - Bluestem pasture and 3 pounds of soybean pellets per head daily.
Lot 4—May 1 to October 10 - Bluestem pasture.

### OBSERVATIONS

1. All lots made excellent gains during the early summer period when the grass was not supplemented.
2. Feeding protein during the late summer period increased the gain in every lot during that period; 15 pounds per head for Lot 1, 44 pounds per head for Lot 2 and 43 pounds per head for Lot 3.
3. Lots 1, 2 and 3 carried more flesh than Lot 4, their hair presented a more glossy appearance, and they were appraised at a higher price, 50c a hundred more for Lot 1 and $1.00 a hundred more for Lots 2 and 3. (The presence of three plain steers in Lot 1 reduced the appraisal price of that lot.)
4. The total gain for the grazing season does not indicate a strong response to caking in respect to total gain in this test. On the other hand, the higher appraisal price, particularly in the case of Lots 2 and 3, coupled with an increased gain in the case of Lot 3 makes caking appear worthwhile.
5. Of interest is the fact that the 40 steers in this test, 30 of which were caked for various periods, had a shrink of only 2.7% when shipped to market. Similar steers shipped with them, none of which were caked, shrank 6.7%.

## Project 253-4: Wintering and Grazing Yearling Steers

### B—Wintering Yearling Steers on Bluestem Pasture 1949-50

Ed F. Smith—R. F. Cox

The maximum utilization of bluestem pasture in keeping with sound management is of utmost importance to Kansas stockmen. If a system of wintering and grazing yearling steers can be developed to utilize bluestem grass profitably during the winter it will be a major contribution to the industry.

The primary purpose of this study, then, is to test the value of dry bluestem pasture as a winter feed for yearling steers when fed different kinds and amounts of protein supplements.

### EXPERIMENTAL PROCEDURE

Four lots of good quality Hereford yearling steers, 10 head to a lot, were used in this test which started on December 11, 1949. All of the four pastures in which these steers were wintered had been grazed the previous season but a plentiful supply of dry grass was available. There are creek bottoms with some blue grass in each of these pastures. From 6 to 19 acres of pasture were allowed each steer.

Each lot received a supplement in addition to pasture as follows:
Lot 1—2 pounds of soybean pellets per head daily.

Lot 2—4 pounds of soybean pellets fed per head every other day.

Lot 3—6.9 pounds of alfalfa hay per head daily.

Lot 4—Soybean oil meal and salt self-fed (the salt was mixed with the soybean oil meal to limit its consumption and make it possible to self-feed the protein supplement).

The proportions of soybean oil meal and salt were 100 pounds of soybean oil meal and 35 pounds of salt.

**TABLE 1. THE EFFECT OF FEEDING A PROTEIN SUPPLEMENT DURING THE LATTER PART OF THE GRAZING SEASON TO TWO-YEAR-OLD STEERS ON BLUESTEM PASTURE**

PHASE I—Grazing, Early Summer Period

May 1 to August 1, 1949—92 Days

| | | | | |
|---|---|---|---|---|
| 1. Lot number | 1 | 2 | 3 | 4 |
| 2. No. steers per lot | 9 | 10 | 10 | 10 |
| 3. Av. initial weight, lbs. | 757 | 806 | 769 | 775 |
| 4. Av. final weight, lbs. | 991 | 1003 | 1002 | 1018 |
| 5. Av. gain, lbs. | 234 | 197 | 233 | 243 |
| 6. Daily gain, lbs. | 2.54 | 2.14 | 2.53 | 2.64 |

PHASE II—Grazing, Late Summer Period

August 1, 1949 to October 10, 1949—70 Days

| | | | | |
|---|---|---|---|---|
| 7. Period during which soybean pellets were fed | July 18 to Oct. 10, '49 | Aug. 10 to Oct. 10, '49 | Sept. 1 to Oct. 10, '49 | None fed |
| 8. Soybean pellets fed per steer daily, lbs. | 3 | 3 | 3 | |
| 9. Av. initial weight, lbs. | 991 | 1003 | 1002 | 1018 |
| 10. Av. final weight, lbs. | 1060 | 1101 | 1099 | 1072 |
| 11. Av. gain, lbs. | 69 | 98 | 97 | 54 |
| 12. Av. daily gain, lbs. | .99 | 1.40 | 1.39 | .77 |
| 13. Total soybean pellets fed per steer, lbs. | 287 | 183 | 117 | None |
| 14. Total gain per steer, May 1 to October 10, 1949, lbs. | 303 | 295 | 330 | 297 |
| 15. Appraised value per cwt., October 10, 1949 | $ 21.50 | $ 22.00 | $ 22.00 | $ 21.00 |

**OBSERVATIONS**

1. The winter of 1949-50 was very mild, extremely dry and ideal for wintering cattle.

2. Two pounds of soybean pellets fed per steer daily to Lot 1 on bluestem pasture produced .66 of a pound of gain per head daily. This is approximately twice as much gain as was obtained with any of the other lots.

3. Steers in Lot 2 fed every other day on pasture gained only .34 of a pound per head daily whereas the steers fed daily in Lot 1 gained .66 of a pound per head daily, which in this test makes daily "caking" appear worth while in so far as gain is concerned.

4. Nearly seven pounds of alfalfa hay per head daily fed as a protein supplement to Lot 3 produced only .26 of a pound of gain per head daily whereas 2 pounds of soybean pellets per head daily fed to Lot 1 produced .66 of a pound of gain per head daily.

5. Lot 4 self-fed the soybean meal and salt mixture gained .27 of a pound per head daily which was about the same as the gain made by the steers fed alfalfa hay but considerably below the .66 of a pound daily gain made by the check group, Lot 1. No ill effects were noted in the salt-meal group but they did present a somewhat rougher appearance than the other lots at the end of the wintering period. Some difficulty was experienced in getting them accustomed to the salt-meal mixture.

6. All lots showed a loss in weight for the month of March, the most severe loss being in Lot 4, the salt-meal self-fed group.

**TABLE 1. WINTERING YEARLING STEERS ON BLUESTEM PASTURE 1949-50**

December 11, 1949 to April 15, 1950—125 Days

| | | | | |
|---|---|---|---|---|
| 1. Lot number | 1 | 2 | 3 | 4 |
| 2. Number of steers per lot | 10 | 10 | 10 | 10 |
| 3. Method of feeding | Fed soybean Pellets daily | Fed soybean Pellets every other day | Fed Alfalfa Hay daily | Self-fed Soybean oil meal and Salt mixed together |
| 4. Average daily winter ration, lbs.: | | | | |
| Soybean pellets | 2.00 | 2.02 | | |
| Soybean oil meal | | | | 1.92 |
| Salt | .14 | .14 | .11 | .62 |
| Alfalfa hay | | | 6.91 | |
| Prairie hay[1] | .38 | .38 | .24 | .91 |
| Bluestem pasture | ad lib | ad lib | ad lib | ad lib |
| 5. Average initial weight | 624 | 622 | 623 | 623 |
| 6. Average final weight | 707 | 665 | 655 | 657 |
| 7. Average gain | 83 | 43 | 32 | 34 |
| 8. Average daily gain | .66 | .34 | .26 | .27 |
| 9. Total feed cost per steer | $ 15.79 | $ 15.86 | $ 13.62 | $ 16.21 |
| 10. Initial cost per steer at $24.75 per cwt. | $154.44 | $153.95 | $154.19 | $154.19 |
| 11. Initial cost per steer plus winter feed cost | $170.23 | $169.81 | $167.81 | $170.40 |
| 12. Necessary selling price per cwt. to cover initial cost plus wintering cost | $ 24.08 | $ 25.54 | $ 25.62 | $ 25.94 |
| 13. Appraised value per cwt. on May 5, 1950 | | | | |

1. Prairie hay was fed only when snow covered the grass.

Feed prices: Soybean pellets, soybean meal, $75.00 a ton; alfalfa hay, $17.00 a ton; prairie hay, $13.00 a ton; bluestem pasture, $6.00 for the season; salt, $12.00 a ton.

## Project 68: Factors Influencing the Salt Requirements of Beef Cattle

### The Effect of Withholding Salt on the Growth and Condition of Steers and on the Apparent Digestibility of Feed Constituents

**Ed F. Smith and D. B. Parrish**

(Preliminary Report—Not for Publication)

I—The Effect of Withholding Salt on the Growth and Condition of Steers.