

**A Comparison of Salt-protein Blocks and Salt-protein Loose Mixtures with and without Additional Phosphorus, 1958-59 (Project 253-1).**

E. F. Smith, F. W. Boren, and B. A. Koch

Salt-meal mixtures, with enough salt to limit protein intake, have been used for some time to supply protein on a self-service basis to range cattle. By pressing the salt-protein mixture into block form, there is the possibility of limiting intake mechanically and thereby reducing the salt content of the mixture which would be desirable.

In addition to comparing protein supplied in block form with that supplied by a salt-meal mixture, the value of additional phosphorus supplied in the form of bonemeal was also studied.

The following experimental treatments were compared:

- Pasture 1. Salt and soybean meal in block form.
- Pasture 2. Salt, soybean meal, and phosphorus in block form.
- Pasture 3. Salt and soybean meal mixture.
- Pasture 4. Salt, soybean meal, and phosphorus mixture.

The mixtures or blocks listed above were kept before the animals throughout the winter period. The salt content of the blocks varied from 10 to 20 percent; molasses was included as a binding agent in the blocks, so equal quantities were included in the mixtures. When bonemeal was omitted from the ration, sorghum grain was substituted to make the total feed consumed comparable.

The bluestem pastures had large amounts of mature dried grass on them; each was 60 acres in size, and an attempt was made to equalize the pastures by rotating the animals each 30 days. The experimental treatments for the animals remained the same.

The 40 heifer calves, 10 per treatment, used in the experiment were good to choice quality Herefords from near Fort Davis, Texas, and were assigned randomly according to weight to their treatments.

The experimental treatments were discontinued April 18 but the heifers continued on grass until July 23.

**Observations**

Salt content in both blocks and loose mixtures was varied in attempting to maintain consumption of the supplemental feed at the same level for all lots. Salt content of the blocks varied from 10 to 20 percent and that of the loose mixtures from about 15 to 25 percent. Salt required to control intake of supplemental feed in block form was 0.29 pound per head daily (lots 1 and 2) compared with an average of 0.49 pound per heifer daily (lots 3 and 4) for those on the loose mixture. Most of the difference occurred early in the feeding period when the heifers readily consumed the salt-meal mixtures but were not accustomed to the blocks.

The only variable in animal response among any of the treatments was the somewhat depressed gain of the pasture heifers fed the salt-protein-phosphorus mixture, which would seem to indicate the salt-protein-phosphorus block fed to pasture 2 was superior; however, the gains were about the same in the comparison of the block and mixture where additional phosphorus was omitted in lots 1 and 3. In these trials, it is doubtful if any difference in animal response between blocks and mixtures was obtained.

Additional phosphorus supplied in the form of bonemeal failed to improve animal performance.

**Table 12**

**A comparison of salt-protein blocks and loose salt mixtures with and without additional phosphorus.**

Wintering—December 16, 1958, to April 18, 1959—137 days.

Pasture number	1	2	3	4
Treatment	Salt-protein block	Salt-protein block plus phosphorus	Salt protein, loose mixture	Salt protein, loose mixture plus phosphorus
Number heifers	10	9 <sup>1</sup>	9 <sup>1</sup>	10
Initial wt. per heifer, lbs.	447	444	449	446
Gain per heifer	-5	-2	-5	-28
Daily gain per heifer	-.04	-.01	-.04	-.20
Daily ration per heifer, self-fed, lbs.:				
Soybean meal	1.31	1.19	1.36	1.26
Salt	.30	.28	.52	.46
Molasses	.09	.09	.07	.07
Ground sorghum grain	.19		.21	
Bonemeal		.18		.19
Total	1.89	1.74	2.16	1.98
Bluestem pasture		Free choice		
Feed cost per heifer <sup>2</sup>	\$10.93	\$11.21	\$11.55	\$11.87
Grazing—April 18, 1959, to July 23, 1959—96 days.				
Initial wt. per heifer, lbs.	442	442	444	418
Gain per heifer	162	153	161	161
Daily gain per heifer	1.69	1.59	1.68	1.68
Grazing cost per heifer	\$14.00	\$14.00	\$14.00	\$14.00
Summary—December 2, 1958, to July 23, 1959—233 days.				
Initial wt. per heifer, lbs.	447	444	449	446
Final wt. per heifer, lbs.	604	595	605	579
Gain per heifer	157	151	156	133
Daily gain per heifer	.67	.65	.67	.57
Feed cost per heifer	\$24.93	\$25.21	\$25.55	\$25.87
Feed cost per cwt. gain	\$15.88	\$16.69	\$16.38	\$19.45

1. One heifer removed from pasture 2 because of pregnancy and one from pasture 3 due to unthriftiness.

2. Feed prices used are on inside back cover.

**A Comparison of Dry Rolled and Steam Rolled Sorghum Grain, 1959 (Project 253-2).**

E. F. Smith, D. Richardson, B. A. Koch, and F. W. Boren

Good to choice quality yearling Hereford heifers originating near Fort Davis, Texas, were used in the trial. They had been on bluestem pasture prior to the test and were allotted to treatments on the basis of prior treatment and weight.

The two lots were fed in an identical manner except one lot received dry rolled sorghum grain (resembling cracked grain, as rollers were set to crack rather than roll the grain) and the other lot received steam rolled grain. Some difficulty was encountered in removing sufficient moisture from the steam rolled grain after rolling to prevent it from heating.

**Observations**

Results are reported in Table 13. The two treatments produced only minor differences. Results of this test indicate that steam rolled grain is about equal to dry rolled grain for fattening yearling heifers. However, due to failure to remove sufficient moisture from the steam rolled grain after it was rolled, part of it heated and developed a musty aroma which may have affected test results.

Table 13

A comparison of dry rolled and steam rolled sorghum grain.  
July 25 to November 6, 1959—104 days.

Treatment	Dry rolled grain	Steam rolled grain
Lot number	15	17
Number heifers	9 <sup>1</sup>	9
Initial wt. per heifer, lbs.	604	602
Gain per heifer	260	251
Daily gain per heifer	2.50	2.41
Daily ration per heifer, lbs.:		
Sorghum grain, self-fed	17.3	17.1
Soybean meal	1.5	1.5
Prairie hay	4.7	4.8
Ground limestone	0.1	0.1
Salt	0.06	0.04
Feed per cwt. gain:		
Grain	692	708
Soybean meal	60	62
Prairie hay	188	199
Dressing percentage	58.6	58.9
Av. carcass grade <sup>2</sup>	16.7	16.6
Marbling score <sup>3</sup>	7.7	7.9

1. Ten heifers were in this lot originally; one was removed due to poor health.

2. The USDA grade low good was assigned a numerical value of 16; average good, 17.

3. Degree of marbling: A score of 7 indicates small amount, 8 indicates slight amount. The higher the score, the less marbling.

#### A Comparison of Feeding Hay to Heifers on Bluestem Pasture and in Drylot, 1958-1959. Project 253-2.

E. F. Smith, D. L. Good, B. A. Koch, and F. W. Boren

This study was designed to evaluate mature dry winter pasture for animals fed all of the harvested roughage such as hay that they would consume. In addition one group of animals wintered in drylot were moved to pasture one month prior to the start of the summer growing season to study their adjustment to pasture.

The following experimental treatments were used:

Lot 8—Wintered in a 139-acre bluestem pasture from December 1, 1958, to April 30, 1959, and fed all of the prairie hay they would eat with 4 to 6 pounds of alfalfa hay per head daily.

Lot 18—Wintered in a drylot 50 by 120 feet in size from December 1, 1958, to April 30, 1959, and fed hay in the same manner as lot 8.

Lot 18A—Wintered in a drylot 50 by 120 feet in size from December 1, 1958, to March 30, 1959, and fed hay in the same manner as lot 8 and lot 18. From December 1, 1958, to March 30, 1959, these animals were wintered with lot 18; from March 30, 1959, to April 30, 1959, they were in the same pasture as lot 8.

#### Observations

The results of this test are reported in Table 14.

Feeding hay to heifers on pasture reduced their hay intake as compared to drylot feeding.

Those fed hay on pasture gained less than those fed in drylot, and those moved to pasture one month before the grazing season also gained less than those kept in drylot.

The heifers in this test were grazed together during the summer following the winter period. The combined winter and summer gains in pounds per head daily were: lot 8, 0.66; lot 18, 0.75; lot 18A, 0.71. None of these gains were significantly different when statistically analyzed.

Table 14

A comparison of feeding hay to heifers in drylot and on pasture.  
December 1, 1958, to April 30, 1959—150 days.

Lot number	8	18	18A
Number heifers per lot	10	10	10
Feeding area	Bluestem pasture	Drylot	Bluestem pasture and drylot
Initial wt. per heifer, lbs.	493	497	497
Gain per heifer, lbs.	12	87	45
Daily gain per heifer, lbs.	0.08	0.58	0.30
Standard error of mean	±0.06	±0.06	±0.05
Daily ration per heifer, lbs.:			
Alfalfa hay	4.6	4.9	4.6
Prairie hay	7.7	9.8	8.9
Bluestem pasture	Yes	No	Month of April only
Mineral (2 parts bonemeal, 1 part salt)	0.18	0.06	0.06

#### A Comparison of Wintering in Drylot with Wintering on Bluestem Pasture for Yearling Steers on a Wintering, Grazing, and Fattening Program, 1958-1959. Project 253-4.

E. F. Smith, F. W. Boren, and B. A. Koch

This is the third trial in a series designed to study the effect of winter management on performance of yearling steers. The first trial was reported in Circular 349 and the second in Circular 371 from this station. Yearlings consume large quantities of feed compared with calves, and cost of production is increased accordingly. This study is concerned with lowering the cost of wintering by introducing the use of low-cost, low-quality winter grass and observing its effect on future performance, especially with regard to the effect on the carcass.

#### Experimental Procedure

Twenty head of yearling Hereford steers, grading about high good on the basis of USDA feeder grades, were used in the test. They came from near Fort Davis and Paducah, Texas, and were allotted into two lots on the basis of origin and weight. They were the heavy end of the calves purchased in the fall of 1958 and were about one year old when started on the test. The only difference in treatment of the two lots was during the winter period; the treatment for the two lots was as follows:

Lot 12. Wintered on bluestem pasture supplemented with 5 pounds of alfalfa hay per head daily; bluestem pasture from April 30 to July 23; fed grain on grass from July 23 to November 14 and grain in drylot from November 14, 1959, to January 8, 1960.

Lot 23. Wintered in drylot on prairie and alfalfa hay and then handled for the remainder of the test in an identical manner to lot 12.

#### Observations

1. The difference in winter management produced a significant difference in winter gain, which was reduced somewhat during the summer and fattening phase, but in total gain for all phases the steers wintered in drylot gained 32 pounds per head more than those wintered on pasture. This was a statistically significant difference. In addition, they had a higher dressing percentage and produced slightly superior carcasses.

2. Except for the gain and possibly the dressing percentage, the overall differences produced by the two treatments were somewhat small but in every case it favored steers wintered under drylot conditions.