

Ammoniated molasses (15%)		.89 ³	.05 ²	.04 ²
Ammoniated molasses (33%)		.06 ¹	.49	.47
Salt	ad lib	ad lib	ad lib	ad lib
Salt, steamed bonemeal	ad lib	ad lib	ad lib	ad lib
Total feed consumed (lbs.):				
Sorghum silage	26000	25900	26000	25150
Ground milo grain	2240	1904	2245	2254
Cottonseed meal	1120	730	590	738
Ammoniated molasses (15%)		1000	52 ²	42 ²
Ammoniated molasses (33%)		65 ¹	547	530
Total gain (lbs.)	1896	1317	1320	1454
Feed per 100 lbs. gain:				
Sorghum silage	1371.3	1966.6	1969.7	1729.7
Ground milo grain	118.1	144.6	170.1	155.0
Cottonseed meal	59.1	55.4	44.7	50.7
Ammoniated molasses (15%)		75.9	3.9	2.9
Ammoniated molasses (33%)		4.9	41.4	36.4
Total feed per cwt. gain	1548.5	2247.4	2229.8	1974.7

1. Substituted due to delay in receiving 15 percent molasses.
2. Substituted due to delay in receiving 33 percent molasses.
3. No molasses fed the last 28 days of the trial.

Table 14.—Average Daily Gain by 28-Day Weigh Periods (Pounds).

Lot	8	9	10	11
1st 28-day period	1.84	1.11	.86	.40
2nd 28-day period	1.75	1.05	1.41 ²	1.57 ¹
3rd 28-day period	1.66	1.11	1.48	1.84
4th 28-day period	1.51	1.43 ³	.96	1.37
Av. entire 112 days	1.69	1.18	1.18	1.30

1. 33 percent ammoniated molasses reduced to .33 pound and .75 pound cottonseed meal added at end of first 28-day period.
2. Amount of ammoniated molasses reduced from .7 pound to .5 pound per head daily.
3. Molasses removed completely because of stimulation. Animals put on control ration.

The Effect of Grazing Systems on Livestock and Vegetation

Comparison of Different Methods of Managing Bluestem Pastures, 1953.

PROJECTS 353-3 and 353-5

E. F. Smith, K. L. Anderson, and F. H. Baker

The objectives of this experiment are to determine the effects of different stocking rates, deferred grazing, and burning on livestock gains,

on productivity of pastures, and on the bluestem vegetation itself. In addition to the yearly report, a brief summary of the cattle gains for the past four years is included.

Experimental Procedure

Good quality Hereford yearling steers weighing approximately 565 pounds were used to stock the pastures. The method of management of each pasture was as follows:

Pasture 1—Normal rate of stocking, 3.75 acres per head.

Pasture 2—Overstocked, 2.74 acres per head.

Pasture 3—Understocked, 5.45 acres per head.

Pastures 4, 5, 6—Deferred and rotation grazing, 3.75 acres per head. All the steers were held in two pastures until June 30, then turned into the protected pasture until August 3. On that date they were placed on the better of the two pastures previously used, where they remained until August 10. After that they were allowed the run of all three pastures.

Pasture 7—Burned March 13, 1953; rate of stocking was 3.67 acres per head.

Pasture 8—Burned April 9, 1953; rate of stocking was 3.67 acres per head.

Pasture 9—Burned April 30, 1953; rate of stocking was 3.67 acres per head.

Observations

1. The largest gains were made by the steers in the late spring-burned, the understocked, the normal-stocked, and the mid spring-burned pastures.

2. The lowest gains were made by the steers in the overstocked, the deferred and rotated, and the early spring-burned pastures.

3. The season was dry. The overstocked, the early, and the mid spring-burned pastures were grazed closely.

4. Effects of the various stocking treatments on the vegetation did not become apparent until 1952. Before that, the better than average moisture conditions resulted in better than average growth of forage that tended to obscure the effects of heavy grazing. Despite the drought of 1952 and 1953, bluestem vegetation improved under light stocking and under deferred grazing, while rather severe depletion is developing under heavy stocking.

The chief criterion for evaluating pasture condition is the vegetative population. Under conservative use the major forage species, big bluestem, little bluestem, indiagrass, and switchgrass, are increasing while less valuable forage species like sideoats, grama, buffalograss, and bluegrama, as well as the weedy invaders, are decreasing. Opposite trends are noted in pastures stocked heavily and are beginning to occur under early and mid spring burning.

Table 15.—A Comparison of Different Methods of Managing Bluestem Pasture, 1953.

Pasture number	1	2	3	4, 5, 6	7	8	9
Management	Normal stocked	Over-stocked	Under-stocked	Deferred rotated	Early spring burned	Mid spring burned	Late spring burned
Number head per pasture	16	22	11	48	12	12	12
Acres in pasture	60	60	60	3-60*	44	44	44
Number acres per head	3.75	2.74	5.45	3.75	3.67	3.67	3.67
Initial wt. per steer	562	563	564	567	562	566	568
Final wt. per steer	788	757	797	764	767	783	802
Gain per steer	226	194	233	197	205	217	234
Daily gain per steer	1.60	1.37	1.64	1.39	1.45	1.54	1.66
Gain per acre	60.13	71.1	42.66	52.66	55.95	59.09	63.86

* Three 60-acre pastures.

1. One steer was removed from pasture 2 and one from pastures 4, 5, and 6 because of lump jaw. Another steer was substituted to maintain the correct stocking rate.

Table 16.—Yearly Account of Cattle Gains Under Different Methods of Grazing Pastures.

Four-Year Summary, 1950-1953.
Gain per Steer in Pounds for the Summer Season.

	Normal stocked	Over-stocked	Under-stocked	Deferred, rotation grazing
1950	221	210	214	205
1951	242	256	290	234
1952	246	209	228	197
1953	226	194	233	197
Average	234	217	241	208

Yearly Account of Cattle Gains on Burned and Nonburned Pastures.

	Not burned	Early spring burned	Mid spring burned	Late spring burned
1950	221	216	254	230
1951	253	243	265	254
1952	246	251	278	283
1953	226	205	217	234
Average	238	229	254	252

Feed Prices Used in Beef Cattle Tests, 1953-1954.

Milo grain, cwt.	\$ 2.50
Cottonseed meal or cake, ton	75.00
Special supplement, ton	81.00
Alfalfa hay, ton	25.00
Alfalfa silage, ton	8.00
Sorghum silage, ton	8.00
Corn cobs, ton	14.00
Prairie hay, ton	22.00
Dry bluestem pasture, calves per head per month	.50
Dry bluestem pasture, yearlings per head per month	.75
Mineral (2 pounds bonemeal to 1 pound salt), cwt.	4.00
Salt, ton	15.00

Chemical Analysis of Feeds Used in Feeding Trials, 1952-1954.

Ingredient	Time of analysis	% Moisture	% Protein	% Ether extract	% Crude fiber	% N-free extract	% Ash	% Calcium	% Phosphorus	Mg. carotene per pound
Corn	Winter,	11.58	9.19	4.20	1.90	71.68	1.45			
Soybean pellets	1952-53	9.60	45.56	4.66	4.81	29.66	5.71			
Special cattle supplt.	"	11.27	34.13	1.97	4.91	35.61	12.11			
Ground corn cobs	"	8.87	2.31	.45	33.86	52.92	1.59			1.94
Prairie hay	"	5.22	5.88	2.46	32.35	46.91	7.18			
Alfalfa hay	"	5.95	13.56	1.90	32.18	38.21	8.20			
Atlas sorgo silage	"	65.00	2.77	.88	8.00	20.70	2.65			12.9
Nonwilted alfalfa silage	"	75.00	4.86	1.14	7.33	8.77	2.90			1.0
Wilted alfalfa silage	"	64.70	5.69	.98	11.34	13.56	3.73	.01	.30	1.2
Yellow corn	Summer,	9.45	9.06	4.32	4.03	71.64	1.50			
Milo grain	1953	9.17	11.06	2.95	2.80	71.76	2.26	.04	.34	
Chopped alfalfa hay	"	7.69	16.19	2.01	25.71	39.22	9.18	1.57	.18	7.3
Brome hay (cut after harvesting seed)	"	6.98	8.88	2.12	32.77	41.93	7.32	.29	.13	2.2
Atlas sorgo stover	Winter,	52.50	2.17	.88	10.37	31.04	3.04	.12	.03	7.7
Dehydrated alfalfa pellets	1953-54	6.65	20.00	3.49	18.25	40.65	10.96	2.09	.27	58.0
Dehydrated alfalfa meal	"		20.00							64.0
Cottonseed meal	"	7.95	41.63	4.01	11.80	28.49	6.12	.16	1.14	
Soybean oilmeal	"	8.70	48.63	2.77	4.51	28.35	7.04	.33	.63	
Yellow corn	"	10.70	10.06	3.84	2.08	71.89	1.43	.01	.33	

The Improvement of Beef Cattle Through Breeding Methods
PROJECT 286

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The purebred Shorthorn cattle breeding project proceeded according to plan during the last year. The project has been planned to facilitate the collection of production data that will be used to devise and test breeding procedures useful to cattlemen to improve beef cattle through breeding methods.

Pedigree barriers were established in the original College Shorthorn herd in 1950 and two inbred lines are being developed. College Premier 29th, 2368167, and Gregg Farm's Hoarfrost, 2492499, have been used as herd sires for this purpose and the inbred lines are designated as the Wernacre Premier and Mercury lines, respectively, for these two foundation sires. The inbreeding program in the Wernacre Premier line was initiated in 1949 by mating College Premier 29th to his half-sisters. These matings were continued during 1950, 1951, 1952, and 1953. A son of College Premier 29th, KSC Premier C 11th, was mated to the females produced in the Wernacre Premier line to extend the inbreeding into the second generation. Calves from these matings were produced in 1952 and 1953.

Calves sired by Gregg Farm's Hoarfrost in 1951, 1952, and 1953 were not inbred because the dams of these were not related to him. Inbreeding in the Mercury line was initiated in 1952 by mating the daughters of Gregg Farm's Hoarfrost to one of his sons, KSC Mercury. Calves from these matings were produced in 1953.

The females in the project are pasture-bred to calve in the spring of each year. The calves are not creep-fed during the suckling period while the cows are on grass. All calves are weaned at 182 days of age and placed on individual feeding trials for 182 days after a three week adjustment period following weaning.

The full-feed ration for the bulls and steers consists of 75 percent corn and 25 percent chopped alfalfa hay, and that for the heifers, 55 percent corn and 45 percent chopped alfalfa hay.

All steers are maintained on a fattening ration after completing the regular feeding trial and slaughtered in the College meats laboratory for detailed carcass studies.

The feeding trial data for the 1952 calf crop are summarized in Table 17, and a partial summary of the 1953 calf crop is presented in Table 18. The feeding trials for the 1953 calves have not been completed to date and the number of days of feeding is designated for each animal.