

stone was fed to each lot. Lot 1 received finely ground milo, Lot 2 cracked milo and Lot 3 rolled milo.

An adjustment and preliminary period was followed by a collection period of 10 days. During the collection period, feces were collected for chemical analysis.

The digestibility of dry matter, protein, crude fiber, ether extract and nitrogen-free extract was higher for the rolled milo ration than for the cracked or finely ground milo rations. With the exception of crude fiber the digestibility of the nutrients of the cracked milo grain ration was the lowest of the three rations.

Effect of Rolling, Course and Fine Grinding on the Digestibility of Milo Grain

Lot No.	No. of steers	Ration	Av. apparent coefficient of digestibility percent—				
			Dry matter	Crude protein	Ether extract	Crude fiber	N.F.E.
1	4	Fine milo, sorghum silage, soybean pellets, salt, ground limestone	71.97	60.8	72.4	51.0	78.6
2	4	Cracked milo, sorghum silage, soybean pellets, salt, ground limestone	67.60	58.8	68.0	55.0	72.4
3	4	Rolled milo, sorghum silage, soybean pellets, salt, ground limestone	75.80	63.2	73.1	56.8	82.5

Project 68: Factors Influencing the Salt Requirements of Beef Cattle¹

The Effect of Withholding Salt on the Growth and Condition of Steers, 1950-51.

E. F. Smith, D. B. Parrish, and E. J. Splitter

This test was to find what effect the withholding of salt has on the performance of steers on either fattening rations or wintering rations.

Forty-two head of good quality Hereford steer calves were used in the test. There were four lots, 10 head to each lot, except that one lot contained 12 head. Two of the lots were full-fed grain and two of the lots were fed wintering rations. For the two lots receiving wintering rations, the test was terminated May 2, 1951. The two lots on a full feed of grain were fed until July 9, 1951. A feedstuff analysis of the feeds used in the test may be found on page — of this bulletin.

Observations

1. Lot 1, on a full feed of grain and given free access to salt, gained only slightly more than Lot 2, which also was full-fed but from which salt was withheld. There was practically no difference in amount of feed consumed or in efficiency of gain (see table, Lots 1 and 2). Lot 2 sold for less per hundredweight and graded lower in the carcass. On foot, Lot 2 did not appear to be as well finished as Lot 1.

1. This study was supported in part by the Salt Producers' Association of Detroit, Michigan.

2. The gain of steer calves on a roughage (wintering) ration was decreased appreciably when salt was withheld (see table, Lots 3 and 4). The calves given free access to salt consumed slightly more feed and were much more efficient in converting their feed into pounds of beef.

The Effect of Withholding Salt on the Growth of Steer Calves.

December 5, 1950, to July 9, 1951—Lots 1 and 2
December 5, 1950, to May 1, 1951—Lots 3 and 4

1. Lot number	1	2	3	4
2. No. steers in lot	10	10	12	10
3. Management	Full fed		Wintered	
4. Initial weight per steer ..	419	418	419	418
5. Final weight per steer	902	889	529	505
6. Gain per steer	483	471	110	87
7. Daily gain per steer	2.24	2.18	.75	.59
8. Daily ration per steer, lbs.:				
Ground milo grain	11.94	11.92		
Soybean oil meal pellets	1.37	1.37	1.00	1.00
Sorghum silage (Tenn. Orange)	7.55	6.87	28.35	27.52
Alfalfa hay	2.51	2.45		
Prairie hay45	.53		
Salt, free access05		.15	
9. Feed required per 100 lbs. gain, lbs.:				
Ground milo grain	533.95	546.82		
Soybean oil meal pellets	61.43	62.45	134.09	168.97
Sorghum silage (Tenn. Orange)	337.47	312.87	3788.88	4649.43
Alfalfa hay	112.22	111.81		
Prairie hay	20.19	24.05		
Salt	2.03		19.66	
10. Selling price per cwt., dollars	34.45	34.05		
11. Carcass grades:				
Prime	6	4		
Choice	4	5		
Good		1		

The Effect of Withholding Salt on the Growth and Condition of Steers, 1951-52.

E. F. Smith, D. B. Parrish, and E. J. Splitter

Preliminary Report

Introduction

This is a progress report on an experiment to be completed this summer, 1952, to find out what effect the withholding of salt has on the growth and fattening of steers.

Experimental Procedure

Twenty head of good quality Hereford steer calves were used in the test. They were a part of the heavy end of a group of 150 calves purchased in the vicinity of Marfa, Texas, for experimental tests. There are two lots, 10 head to a lot, and both lots are being self-fed a ground milo grain and chopped alfalfa hay mixture at the rate of 3 pounds of milo grain to 1 pound of alfalfa hay. Lot 1 has free access to salt, whereas salt is being withheld from Lot 2.

Observations

To date in this test the addition of salt to a fattening ration of ground milo grain and chopped alfalfa hay has failed to increase the rate or efficiency of gain.

The Effect of Withholding Salt on the Growth and Fattening of Steers. (December 22, 1951, to March 29, 1952—98 days)

Lot number	1	2
Number of steers per lot	10	10
Management	Free access to salt	Fed no salt
Initial weight per steer, lbs.	503	502
Final weight per steer, lbs.	748	744
Gain per steer, lbs.	245	242
Daily gain per steer, lbs.	2.50	2.47
Daily ration per steer, lbs.:		
Cracked milo grain	12.58	12.43
Chopped alfalfa hay	8.22	8.38
Salt	.05	
Feed required per 100 lbs. gain, lbs.:		
Cracked milo grain	503.46	503.51
Chopped alfalfa hay	329.10	339.39
Salt	2.04	

Wintering, Grazing, and Fattening Steer Calves, 1951-52

The Value of Trace Minerals in a Wintering and a Fattening Ration. Self-feeding Grain in Dry Lot vs. Self-feeding Grain on Bluestem Pasture.

E. F. Smith and R. F. Cox

Introduction

This is a report of the wintering phase of this test. Following this phase the different lots will be grazed together on bluestem pasture and then full-fed grain until they grade choice. One objective of the test is to find out the effect of trace mineralized salt containing iodine, copper, cobalt, iron, and manganese on the performance of steer calves on wintering rations and on a full feed of grain. Another phase of the test is to compare self-feeding grain in dry lot to self-feeding grain on grass for calves handled in the deferred full-feeding program. The system of deferred full-feeding using good quality steer calves consists of three phases: (1) producing 225-250 pounds of gain during the winter; (2) grazing 90 days without grain; (3) full feeding 100 days in the dry lot.

Experimental Procedure

Thirty head of good quality Hereford steer calves are being used in this test in three lots, 10 head to a lot. They were part of a shipment of 150 steer calves from Marfa, Texas. They were received November 8, 1951, and fed silage, prairie hay, and 1 pound of a protein concentrate per head daily until December 22, 1951, when they were started on test. The system of management planned for each lot follows:

Lot 1—wintered on sorghum silage, prairie hay, 5 pounds of ground grain, and 1 pound of 41 percent protein concentrate per head daily, free access to mineral (bonemeal and salt) and salt; bluestem pasture May 1 to August 1; self-fed grain on bluestem pasture after August 1 to choice grade.

Lot 2—wintered on sorghum silage, prairie hay, 5 pounds of grain, and 1 pound of protein concentrate per head daily, free access to mineral (bonemeal and salt) and salt; grazed on bluestem pasture May 1 to August 1; self-fed grain in dry lot after August 1 to choice grade.

Lot 3—wintered on sorghum silage, prairie hay, 5 pounds of grain, and 1 pound of protein concentrate per head daily; free access to mineral (bonemeal and salt) and trace mineralized salt; grazed on bluestem pasture, May 1 to August 1; self-fed grain in dry lot from August 1 until they grade choice.

Observations

No differences due to treatment were apparent between the lots. The difference in gain between Lots 1 and 2 handled identically demonstrates the variability in cattle gains.

Wintering, Grazing, and Fattening Steer Calves

Phase I—Wintering—Value of Trace Minerals in a Wintering Ration. (December 22, 1951, to April 4, 1952—104 days)

Lot number	1	2	3
Number of steers per lot	10	10	10
Ration	Sorghum silage Prairie hay Milo Cottonseed cake Mineral ¹ Salt	Sorghum silage Prairie hay Milo Cottonseed cake Mineral ¹ Salt	Sorghum silage Prairie hay Milo Cottonseed cake Mineral ¹ Trace mineral salt ²
Average initial weight, lbs.	444	443	443
Average final weight, lbs.	602	588	594
Average gain, lbs.	158	145	151
Average daily gain, lbs.	1.52	1.39	1.45
Average daily ration, lbs.:			
Ground milo grain	5.11	5.11	5.10
Cottonseed cake	1.00	1.00	1.00
Sorghum silage	20.29	20.34	20.02
Prairie hay	.16	.17	.22
Mineral ¹	.11	.12	.10
Salt	.12	.12	
Trace mineral salt ²			.08