

**TABLE 2. THE EFFECT OF WITHHOLDING SALT ON THE AP-  
PARENT DIGESTIBILITY OF FEED CONSTITUENTS**

1949 data

Lot No.	No. of Steers	Ration	Digestibility of Rations					
			Av. Apparent Dry Matter	Coefficient of Crude Protein	Ether Extract	Digestibility of Crude Fiber	Ash	N. P. E.
1	3	C. S. M. Silage Salt	61.4	62.2	66.3	58.4	40.5	64.2
2*	3	C. S. M. Silage	59.9	61.5	65.7	57.4	36.0	62.5
3	3	Dehy. Alfalfa pellets Silage Salt	60.0	61.9	60.6	49.1	48.1	67.7
4*	3	Dehy. Alfalfa pellets Silage	56.9	59.7	58.4	45.0	40.9	65.8

\* Steers had no access to salt during previous five months.

**BALANCE STUDY**

The six steers on the cottonseed meal-silage ration were also used to study nitrogen, ash, sodium, and chloride balance at the same time as the digestion trials were run.

The animals were all found to be in positive nitrogen balance. Ash output was 6 to 12 percent of intake except in the case of one steer in the non-salt group which died later. This steer also retained less sodium and chlorine than did the others receiving no salt. With the exception of one other steer, sodium retention was similar regardless of which group they were in. Chlorine retention was almost twice as high by steers receiving no salt as those having access to salt.

**SODIUM AND CHLORIDE CONCENTRATIONS IN BLOOD**

The concentrations of sodium and chlorides in the blood were determined at two stages during this study of the effect of withholding salt. The first analyses were made at the time of the digestion trial, at which time half of the steers had received no dietary salt for six months. Analyses also were made at the termination of the study, at which time salt had been withheld for 11 months. Results indicate that the rations fed during this test either with or without salt, furnished sufficient sodium and chloride to maintain normal blood concentrations of these ions.

Lot 2, fed a limited salt allowance, gained about the same. The non-salt fed lot gained considerably less than either of the other lots. Its gain was only .65 of a pound per head daily.

The steers were fed all the silage they would consume. The steers in Lot 1 which had free access to salt consumed 28.2 pounds of silage per head daily whereas the steers in Lot 3 which received no salt consumed only 26.15 pounds of silage per head daily.

The amount of feed required to produce 100 pounds of gain was almost twice as high for the steers not allowed access to salt, Lot 3, as it was for steers fed salt, Lot 1.

**TABLE 1. THE INFLUENCE OF SALT ON THE GAINS OF  
STEER CALVES**

December 14, 1949 to April 15, 1950—122 Days

1. Lot number .....	1	2	3
2. Number of steers per lot .....	5	4	5
3. Management .....	Free access to salt	Limited salt allowance	No salt
4. Average initial weight .....	448	447	448
5. Average final weight .....	602	596	527
6. Average gain .....	154	149	79
7. Average daily gain .....	1.26	1.22	.65
8. Average daily ration, lbs.:			
Soybean pellets .....	1.00	1.00	1.00
Silage .....	28.20	29.30	26.15
Salt .....	.8 oz.	.16 oz.	No salt
9. Feed required per 100 pounds of gain, lbs.:			
Soybean pellets .....	79.22	81.88	154.43
Silage .....	2233.77	2399.33	4037.97

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

The Influence of Salt on the Gains of Steer Calves  
1949-50

Ed F. Smith - D. B. Parrish

Three lots of steer calves were wintered on silage and 1 pound of soybean pellets per head daily. In addition to this ration Lot 1 received free access to salt, Lot 2 was fed a limited salt allowance (approximately one-sixth of an ounce per head daily) and Lot 3 received no salt. Lot 1 allowed free access to salt gained 1.26 pounds per head daily.

CHEMICAL ANALYSIS OF FEEDS USED IN THE 1948-1949 BEEF CATTLE FEEDING TRIALS

	Moisture %	Protein %	Fat %	Fiber %	N-free extract %	Mineral matter %	Calcium %	Phosphorus %
Soybean oil meal .....	9.51	43.69	5.38	6.09	29.31	5.79	.41	.59
Soybean pellets .....	9.14	43.81	5.60	6.14	29.31	5.88	.40	.59
Cottonseed meal .....	9.01	41.13	4.94	10.46	28.60	5.84	.32	1.13
Linseed oil meal .....	8.83	36.38	4.05	8.10	36.88	5.66	.55	.86
Dehydrated alfalfa pellets .....	8.57	15.38	2.70	28.25	37.15	7.74	1.77	.13
Dehydrated brome grass pellets..	8.76	16.38	3.40	26.67	36.35	8.07	.78	.22
Corn .....	11.92	9.50	4.52	2.27	70.44	1.54	.009	.26
Atlas sorgo silage .....	71.4	1.84	.80	8.30	15.6	1.85	.11	.049
Prairie hay .....	7.07	5.00	2.06	33.04	45.30	7.25	.46	.12
Bluestem pasture grasses, 1949 (computed to a no-moisture basis)								
May 20 .....	0	10.78						
June 1 .....	0	8.29						
June 10 .....	0	8.36						
June 21 .....	0	7.3						
July 1 .....	0	8.94						
July 11 .....	0	9.29						
July 20 .....	0	7.44						
August 1 .....	0	7.04						
August 10 .....	0	5.97						
August 20 .....	0	5.24						
September 1 .....	0	6.28						
September 10 .....	0	6.00						
September 20 .....	0	6.80						
October 1 .....	0	3.48						
October 10 .....	0	4.03						
November 1 .....	0	4.93						
December 1 .....	0	3.90						
Bluestem pasture grasses, 1950 (Air dry basis)								
January 1 .....	11.58	2.44	1.81	30.92	45.07	8.24	.39	.067
February 1 .....	15.38	2.63	1.63	29.27	43.26	7.83	.39	.067
March 1 .....	7.40	2.81	1.50	33.20	46.11	8.98	.41	.03

Project 110: Swine Feeding Investigations

The comparative value of corn and sorghum grains as swine fattening feeds.

C. E. Aubel

In many parts of Kansas, sorghum grains are used extensively for hog feeding. In previous feeding tests with hogs at this station, ground kafir grain was shown to have about 90 percent of the value of corn. In a more recent test, ground Atlas sorgo grain was shown to have 93.5 percent of the value of corn. Since in recent years a number of new varieties of sorghum have been developed and grown throughout the state, hog feeders have a desire to know about the feeding merits of these varieties, especially in times of high priced corn when it might be desirable to substitute sorghum grain for corn. They also wish to know whether the grain should be fed whole or ground.

In order to obtain this information Kansas State College conducted two experiments, one during the winter of 1949 and one during the winter of 1950, to determine the value of several sorghum grains for fattening swine.

EXPERIMENT I—Winter, 1949

The sorghum grains used in this test were some of the varieties recently developed. They were Colby, Westland, Midland and Martin milos.

The following figures show the nutrient content on a percentage basis of the grains used in this experiment.

Feed	Protein	Ether Extract	Crude Fiber	Moisture	Asb	N-free Extract	Carbo-hydrates
Martin Milo .....	9.88	3.24	1.64	11.24	1.31	72.69	74.33
Westland Milo ..	9.06	2.93	1.97	10.87	1.74	63.43	65.40
Midland Milo ....	10.63	3.18	1.45	9.95	1.59	73.20	74.65
Colby Milo .....	14.25	2.90	2.44	10.97	1.92	67.52	69.92
Corn .....	9.88	4.24	1.95	11.16	1.50	71.27	73.22

The following table gives a summary of the record of this experiment.

EXPERIMENT I—Winter, 1949

The comparative value of shelled corn, Colby, Martin, Westland, and Midland milos for fattening pigs in the dry lot.

(January 8, 1949 to April 19, 1949—101 Days)

Ration Fed .....	Alfalfa Hay (Self-fed)				
	Shelled Corn Tankage (Self-Fed)	Ground Martin Milo Tankage (Self-Fed)	Ground Westland Milo Tankage (Self-Fed)	Ground Midland Milo Tankage (Self-Fed)	Ground Colby Milo Tankage (Self-Fed)
Lot Number .....	1	2	3	4	5
No. pigs per lot .....	10	10	10	10	10
Av. Initial Weight per Pig .....	Pounds 77.55	Pounds 76.80	Pounds 77.75	Pounds 78.30	Pounds 78.05
Av. Final Weight per Pig .....	242.87	230.97	255.07	232.50	224.83