EXPERIMENTAL LAMB FEEDING TEST
(First portion of feeding period)
February 2, 1951 to March 30, 1951

Lot number	1	2	3	4	5	6
Ration fed	Corn Alfalfa Hay	Corn Alfalfa Hay	Corn Alfalfa Bicarbonate of Soda	Corn Pelleted Alfalfa	Corn Pelleted Alfalfa	Corn Pelleted Alfalfa Bicarbonate of Soda
Ratio Crude Fiber to T. D. N.	1 / 4	1 / 5.5	1 / 5.5	1 / 4	1 / 5.5	1 / 5.5
Feed per lamb daily						
Corn	1.37	1.62	1.62	1.37	1.62	1.62
Alfalfa	1.45	1.02	1.02	1.45	1.02	1.02
Soda (ounces)	0	0	.2	0	0	.2
Daily gain per lamb	.40	.38	.41	.42	.32	.35

FACTORS INFLUENCING SALT REQUIREMENTS OF SHEEP

Preliminary Report on the Effects of Withholding Salt and the Effects of High and Low Potassium-Sodium Ratios Upon the Feedlot Performance of Lambs.

E. L. Hix, T. Donald Bell, A. L. Good, D. B. Parrish

Many of the feeder lambs coming into Kansas have not had access to salt for several weeks and some of the lamb feeders do not add salt to their lamb fattening rations because of the possible losses in getting the lambs again accustomed to eating salt. The experimental studies, initiated this year, should indicate whether such a practice results in poorer feedlot performance. The studies should also lead to a clearer understanding of the physiological function of salt in the sheep's diet.

EXPERIMENTAL PROCEDURE

Fifty-four feeder lambs were divided into four lots and treated according to the following plan.

Lot 1 (17 lambs)—Basal ration (1.25 pounds corn and 1.45 pounds chopped alfalfa hay).
Lot 2 (17 lambs)—Basal ration plus salt ad libitum.
Lot 3 (10 lambs)—Basal ration plus potassium bicarbonate sufficient to provide a potassium-sodium ratio of 60:1.
Lot 4 (10 lambs)—Basal ration plus sodium bicarbonate sufficient to provide a potassium-sodium ratio of 2:1.5.

At the conclusion of the test mineral balance studies with three lambs from each lot will be conducted. Balance of sodium, potassium, and chlorine in the lambs from each of these groups will be determined. Blood samples will be taken and analyzed for sodium, potassium, magnesium, calcium, chlorine, bicarbonate, plasma protein, and hemoglobin.

OBSERVATIONS

After 67 days of experimental treatment the following results are indicated:

1. The largest average daily gains (0.33 pound) are shown by the lambs in Lot 2 receiving the basal ration plus salt. The lambs in Lot 1, receiving the basal ration without salt, have gained 0.29 pound per head daily. They have consumed the same amount of corn as the lambs in Lot 1, but have eaten a little less alfalfa hay.
2. The exact potassium-sodium ratios initially planned in Lots 3 and 4 could not be attained. Lot 3 received a potassium-sodium ratio of 57:1 and Lot 4 a potassium-sodium ratio of 2:1.5. Lot 4 gained an average of 0.30 pound per head daily, while Lot 3 gained only 0.23 pound per head daily during the first 67 days of the experimental feeding period. The salt consumption ad libitum in Lot 2 has been 0.04 pound per head daily.

Project Commercial No. 65

Performance of Steers Sired by Bulls of Different Sizes

A Comparison of Hereford Steers Sired by Small, Medium, and Large Size Bulls

A. D. Weber, D. L. Mackintosh, D. L. Good, E. F. Smith

The Kansas, Oklahoma, and Ohio Agricultural Experiment Stations co-operated in this study, which was supported by grants from the American Hereford Association. The project involved comparisons of steer

calves sired by small, medium, and large size bulls. Each size group at each station was handled under the following systems of feeding and management:

System I—immediate full feeding for 225 days.

System II—a deferred full-feeding program in which the steer calves are wintered well, grazed without grain from May 1 to August 1, and then full-fed in dry lot 100 days.

System III—the production of two-year-old grass-fat steers without the feeding of grain. Phases under this system include: wintering as calves without grain; grazing as yearlings a full season without supplemental feed; wintering as yearlings without grain; grazing as two-year-olds without supplemental feed and selling as slaughter cattle directly off pasture.

A complete report of the average results obtained at the three stations with each system of feeding and management appeared in the March 15, 1951 issue of the American Hereford Journal. Reprints of this report may be obtained from the American Hereford Association, 300 West 11th Street, Kansas City 6, Missouri.

A complete report on the results at the Kansas station with Systems I and II, and a progress report on the results with System III, were released May 6, 1950 in Kansas Agricultural Experiment Station Circular No. 265. Final data for System III at the Kansas station are presented in Table I which follows.

Table I—A Comparison of Hereford Steers Sired by Small, Medium, and Large Size Bulls

System III—Wintering and Grazing, Two Seasons

Phase I—Wintering as Calves

November 29, 1948 to May 1, 1949—153 Days

1. Lot number	7	8	9
2. Size of sires	Small	Medium	Large
3. Number of steers per lot	10	10	10
4. Initial weight per steer	427	442	454
5. Final weight per steer	574	588	620
6. Gain per steer	147	146	166
7. Daily gain per steer	.96	.95	1.08
8. Daily ration per steer, pounds:			
Soybean meal	1.00	1.00	1.00
Atlas sorgo silage	19.52	19.95	19.82
Prairie hay	5.39	4.88	5.30
9. Feed required per 100 pounds of gain, pounds:			
Soybean meal	104.08	104.79	92.17
Atlas sorgo silage	2032.31	2090.75	1826.81
Prairie hay	561.50	511.58	488.73
10. Cost of feed per 100 pounds gain	$14.62	$14.46	$12.97
11. Total feed cost per steer	$21.49	$21.11	$21.53

Phase II—Grazing as Yearlings

May 1, 1949 to October 15, 1949—167 Days

12. Initial weight per steer	574	588	620
13. Final weight per steer	762	790	834
14. Gain per steer	188	202	214
15. Daily gain per steer	1.13	1.21	1.28

16. Cost of grazing per steer (bluestem pasture)	$12.00	$12.00	$12.00
17. Cost of 100 pounds of pasture gain..	$6.38	$5.94	$5.61

Phase III—Wintering as Yearlings

October 15, 1949 to May 8, 1950—205 Days

18. Initial weight per steer	762	790	834
19. Final weight per steer	923	991	1044
20. Gain per steer	161	201	210
21. Daily gain per steer	.79	.98	1.02
22. Daily ration per steer, pounds:			
Soybean meal	1.01	1.01	1.01
Sorghum silage	38.20	43.46	41.67
Prairie hay	3.98	4.00	4.65
23. Feed required for 100 pounds gain, pounds:			
Soybean meal	128.58	102.99	98.57
Sorghum silage	4863.66	4432.69	4067.76
Prairie hay	506.89	407.76	453.57
24. Cost of feed per 100 pounds gain	$24.43	$21.33	$20.32
25. Total feed cost per steer	$39.33	$42.87	$42.66

Phase IV—Wintering as Two-Year-Olds

May 8, 1950 to August 24, 1950—108 Days

26. Initial weight per steer	923	991	1044
27. Final weight per steer	1076	1152	1203
28. Gain per steer	153	161	159
29. Daily gain per steer	1.42	1.49	1.47
30. Cost of grazing per steer (bluestem pasture)	$15.00	$15.00	$15.00
31. Cost of 100 pounds of pasture gain..	$9.80	$9.32	$9.43

Summary of Phases I, II, III and IV

November 29, 1948 to August 24, 1950—633 Days

32. Initial weight per steer	427	442	454
33. Final weight per steer	1076	1152	1203
34. Gain per steer	649	710	749
35. Daily gain per steer	1.03	1.12	1.18
36. Feed required per 100 pounds gain:			
Soybean meal	72.58	65.57	61.02
Sorghum silage	2181.05	2178.91	1961.83
Prairie hay	330.95	285.34	298.95
Pasture—two seasons			
37. Feed cost per 100 pounds gain	$13.53	$12.81	$12.17
38. Total feed cost per steer	$87.82	$90.98	$91.19
39. Shrink in transit to market:			
Pounds per steer	57	63	60
Percentage	5.3	5.5	5.0
40. Dressing per cent*	59.8	59.8	59.0

* Includes 2% cooler shrink.

41. On-foot grades:			
Low good	1	1	
High medium	5	2	2
Average medium	4	7	6
Low medium			2
42. Carcass grades:			
High commercial	6	5	5
Average commercial	1	5	4
Low commercial	3		
High utility			1
43. Selling price per cwt.	$27.65**	$28.00	$27.50

** Selling price was $28.00 with two out at $26.00, figures $27.65.

The following general summary appeared in the report published in the American Hereford Journal, and is based on the overall results obtained with the three systems of feeding and management at the three stations co-operating in the study:

"1. There was a definite tendency for the steers sired by large-size bulls to gain more than those sired by medium-size bulls, and in turn for those sired by medium-size bulls to gain more than those sired by small-size bulls. These gain advantages tended to be more pronounced during the wintering and grazing phases than during the full-feeding phase.

"2. Overall differences among the three groups in economy of gain were too small to be significant. However, when the ration consisted largely of roughage or grass the steers sired by medium- and large-size bulls produced gains at significantly lower costs than those sired by small-size bulls.

"3. When full-feeding was deferred or omitted entirely, the large steers showed less finish at the conclusion of the test, which was reflected in lower slaughter and carcass grades. But when the steers were full-fed immediately after weaning, there were no significant differences in the slaughter and carcass grades of the three size groups.

"4. The results of these tests indicate that medium-size cattle tend to combine the gaining ability of large cattle and the finishing ability of small cattle without sacrifice of efficiency of gain."

Project 286: Improvement of Beef Cattle Through Breeding Methods, 1950-51

Walter H. Smith, Ed F. Smith and Heman L. Ibsen

A National Beef Cattle Breeding Research Program has been initiated and is organized in three areas which are referred to as the Western, Southern, and North Central Regions in the United States. The Kansas Agricultural Experiment Station is co-operating with 12 other states in the North Central Region. The purebred Shorthorn herd maintained at Manhattan is being used as the primary basis for the purebred cattle breeding investigations conducted by the Kansas station.

The objectives of the project are:

1. To develop testing procedures for the evaluation of breeding animals.
2. To collect data pertaining to the inheritance of physical characteristics of Shorthorn cattle.
3. To determine the practicability of inbreeding for the establishment of two high-producing lines of Shorthorn cattle.

The project is in its preliminary stages and the systems of breeding that have been adopted have been regulated primarily by the founda-

TABLE I—PARTIAL SUMMARY OF CALVES PRODUCED IN SPRING OF 1950. REPRESENTING THE INBRED LINE OF THE WERNACRE'S PREMIER FOUNDATION

Calf No.	Sex	Birth weight pounds	Weaning weight pounds	Daily gain birth to weaning pounds	Feeding trial information*			
					Initial weight pounds	Weight April 1, 1951 pounds	Days on trial April, 1951	Daily gain during trial pounds
81	Bull	76	500	2.20	530	990	149	3.09
61	Bull	90	510	2.20	535	910	149	2.52
23	Bull	66	480	2.09	490	870	149	2.55
13	Bull	74	455	1.91	475	835	149	2.42
11	Bull	75	455	1.96	495	880	156	2.47
49	Bull	52½	440	1.98	480	820	156	2.18
760	Steer	75	420	1.77	425	730	149	2.04
87	Steer	65	355	1.48	375	725	149	2.35
90	Steer	70	445	1.89	465	790	149	2.18
56	Steer	77	410	1.69	425	765	149	2.28
55	Steer	69	425	1.79	455	755	149	2.01
53	Steer	74½	465	2.00	480	750	149	1.81
54	Steer	74	440	1.85	445	680	89	2.64
189	Heifer	78½	440	1.81	475	740	156	1.70
72	Heifer	71	475	2.05	475	785	156	1.99
92	Heifer	67½	435	1.90	440	680	149	1.61
58	Heifer	57	320	1.32	360	570	149	1.41
4	Heifer	60½	335	1.39	340	585	149	1.64
2	Heifer	80	400	1.68	420	625	149	1.38
14	Heifer	70	380	1.58	425	540	67	1.72
39	Heifer	77	420	1.76	410	545	89	1.52

* Feeding trials will be of 196 days' duration for each calf.