

about 3½ pounds of ground sorghum stover, 0.3 to 0.4 pound of protein supplement, plus about 1/5 ounce of limestone would provide satisfactory gains for wintering ewe lambs and would be a more economical ration than alfalfa hay when that roughage is comparatively high in price and poor in quality. A ration of sorghum silage, prairie hay, protein supplement, and limestone probably will give satisfactory results for wintering ewe lambs, but these tests indicate that gains will be lower and more expensive than rations containing ground stover.

Project 236: The Relationship of Physical Balance and Energy Value in Sheep Rations

1951 Trials with Wether Feeding Lambs

by

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Lamb fattening rations varying in physical nature but virtually alike chemically have been studied at the Kansas Agricultural Experiment Station for a number of years. Previous tests have been demonstrated that the rate of gains and the efficiency of feed utilization by fattening lambs are associated closely with the physical balance or the concentration and bulkiness of the ration.

Objects of the 1951 trials:

1. To test the relative efficiency of rations which vary in the amount and in the nature or condition of the crude fiber consumed by fattening lambs.
2. To investigate the value of bicarbonate of soda in controlling digestive disorders in lambs consuming rations which are highly concentrated or which have had the roughage portion of the ration reduced by grinding and pelleting.

Plan of Feeding

- Lot 1—corn and alfalfa hay—medium concentration (Crude Fiber: total digestible nutrients—CF:TDN-1:4).
 Lot 2—corn and alfalfa hay—highly concentrated (CF:TDN ratio of 1:5.1).
 Lot 3—corn and alfalfa hay, plus bicarbonate of soda (CF:TDN ratio of 1:5.1).
 Lot 4—corn and pelleted alfalfa (CF:TDN ratio 1:4).
 Lot 5—corn and pelleted alfalfa (CF:TDN ratio 1:5.1).
 Lot 6—corn and pelleted alfalfa, plus bicarbonate of soda (CF:TDN ratio 1:5.1).

Summary

Results of the test are summarized in the accompanying table and indicate:

1. Gains were just as large with a ration of medium concentration as with those highly concentrated when chopped alfalfa hay was fed with corn. When pelleted alfalfa was fed, a ration of medium concentration produced significantly larger gains than those produced by concentrated rations.
2. Digestive disturbances were frequent in the lots receiving pelleted alfalfa and higher levels of concentrates.
3. Sodium bicarbonate was ineffective in controlling digestive disturbances in those lots receiving the more highly concentrated rations.
4. The rumen content of the lambs receiving the chopped hay was slightly more alkaline than that from lambs receiving the pelleted

PHYSICAL BALANCE IN LAMB FATTENING RATIIONS.

Feeding period—February 2 to May 4, 1951

	1	2	3	4	5	6
1. Lot number	1	2	3	4	5	6
2. Ration fed	Alfalfa	Corn Alfalfa hay	Corn Alfalfa hay Bi. soda	Corn Pelleted alfalfa	Corn Pelleted alfalfa	Corn Pelleted alfalfa Bi. soda
3. Ratio:						
Crude Fiber	1	1	1	1	1	1
to						
T.D.N.	4	5.1	5.1	4	5.1	5.1
4. No. lambs per lot	10	10	9	7	8	10
5. No. days on feed	91	91	91	91	91	91
6. Initial weight per lamb	74.9	75.5	76.6	74.7	78.6	75.3
7. Final weight per lamb	99.4	99.8	101.2	103.3	101.0	93.4
8. Average weight of shorn fleece	5.25	5.35	5.39	4.71	5.30	5.20
9. Total gain per lamb	29.75	29.65	29.99	33.31	27.70	23.30
10. Daily gain per lamb .....	.326	.325	.329	.366	.304	.256
11. Feed per lamb daily:						
Corn	1.34	1.55	1.55	1.34	1.52	1.52
Alfalfa	1.47	1.11	1.11	1.47	1.10	1.10
Bicarbon. soda .....			.20			.20
12. Feed per cwt. gain:						
Corn	409	475	469	366	498	594
Alfalfa	448	341	337	399	361	427
Bicarbon. soda			19			24
13. Feed cost per cwt. gain	\$15.65	\$16.31	\$17.03	\$14.60	\$17.68	\$22.20
14. T.D.N. per lamb daily	1.89	1.87	1.87	1.87	1.87	1.84
15. Gain per 100 lbs. of T.D.N.	16.67	17.36	17.56	19.52	16.51	13.90

alfalfa. This is in agreement with previous observations.

5. The feed cost per hundredweight of gain was lowest for those lots in which a higher proportion of the ration was made up of roughage. The feeds used in the 1951 tests were purchased at the following prices:

Corn	\$ 1.50 per bushel
Alfalfa hay	20.00 per ton
Alfalfa pellets	24.00 per ton
Sodium bicarbonate	4.85 per cwt.

Chemical Analysis of Feeds Used in 1951 Tests

	Protein	Ether extract	Crude fiber	Molsture	Ash	Nitrogen-free extract	Carbo-hydrates
Corn	7.81	4.08	2.06	12.06	1.43	72.56	74.52
Alfalfa hay	15.81	1.48	30.00	8.51	8.43	35.77	65.77
Alfalfa pellets	16.13	1.36	28.19	9.45	8.25	36.62	64.81

Project 111 GC: Lamb Feeding Experiments

Feedlot and Milo Stubble Fattening Tests with Feeder Lambs.

Studies Carried on by the Department of Animal Husbandry and the Garden City Branch Experiment Station.

T. Donald Bell and A. B. Erhart

The lamb feeding tests at the Garden City Branch Agricultural Experiment Station during the fall and winter feeding season of 1951-52 included the following studies:

1. A comparison of alfalfa hay and cottonseed cake as supplements for lambs running in harvested milo fields.
2. A comparison of ground milo grain and whole milo grain for fattening lambs.
3. A comparison of a ration including ground sorghum stover as the only roughage, and a ration including both stover and sorghum silage as sources of roughages.
4. Comparative performance of lambs that have received salt, with lambs that have not received salt during the entire feeding period.
5. A test of the effectiveness of vaccination against enterotoxemia and of bicarbonate of soda in the diet, in controlling "overeating" disease.
6. A comparison of hand-feeding and self-feeding.
7. Tests of the value of drenching for worm control.

Experimental Procedure

The lambs in this year's experiments were secured directly from the mountain range in Southern Utah, and included Columbia-Rambouillet crosses as well as lambs of Suffolk-Rambouillet breeding. They averaged 76 pounds at the range shipping point and 68 pounds off the cars at Garden City; after a period of 50 days of pasture and roughage feeding they were started on the experimental tests weighing 78 pounds.

The lambs were lotted into eight groups of 60 lambs each and given standard western rations of sorghum stover, sorghum grain, protein supplement, and limestone. After two lots of lambs reached an average daily grain ration of 1 pound per head, they were turned in to milo stubble. One lot was given alfalfa hay as a supplement and the other lot was given soybean pellets.

Two other lots of lambs were hand-fed grain until they were consuming nearly 2 pounds per head daily. They were then fed all of the grain and roughage that they would consume free choice. One-half

of the lambs in all lots were vaccinated against overeating disease, and one of the lots being fed free choice was given soda.

A portion of the sorghum stover was replaced by sorghum silage in one lot, the grain was ground for another lot, and the lambs in another lot received no salt.

One-half of the lambs in all lots were drenched and their gains compared with those of the undrenched lambs.

Feed Prices:

Westland milo	\$ 2.50 per cwt.
Ground milo	2.60 per cwt.
Soybean pellets	101.45 per ton
Axtell stover	7.50 per ton
Alfalfa hay	40.00 per ton
Limestone	1.00 per cwt.
Salt	.90 per cwt.
Soda	4.85 per cwt.
Sorghum stubble	.01 per head per day
Axtell silage	8.00 per ton

TABLE 1.—Feedlot Tests with Fattening Lambs. November 19, 1951, to February 21, 1952

1. Lot number	1	2	3	4
2. Ration fed	Milo Axtell stover Protein Limestone Salt	Milo (ground) Axtell stover Protein Limestone Salt	Milo Axtell silage Axtell stover Protein Limestone Salt	Milo Protein Axtell stover Ground limestone No salt
3. Number of lambs per lot	60	59	60	60
4. Number of days on feed	94	94	94	94
5. Initial wt. per lamb	79.75	77.97	78.54	77.69
6. Final wt. per lamb	107.60	109.89	111.17	102.34
7. Total gain per lamb	27.85	31.92	32.63	24.65
8. Daily gain per lamb .....	.296	.339	.347	.262
9. Feed per lamb daily				
Milo grain	1.26	1.26	1.15	1.26
Axtell stover	2.40	2.40	.53	2.29
Axtell silage			5.56	
Alfalfa hay				
Soybean pellets .....	.20	.20	.20	.20
Ground limestone .....	.019	.019	.019	.019
Salt .....	.022	.027	.017	
10. Feed per cwt. of gain				
Milo grain	425.6	370.8	331.4	480.9
Axtell stover	810.8	707.4	152.7	874.0
Axtell silage			1602.3	
Alfalfa hay				
Soybean pellets	67.6	59.0	57.6	76.3
Ground limestone	6.4	5.8	5.5	7.2
Salt	7.4	7.9	4.9	
11. Feed cost per cwt. of gain	\$17.24	\$15.41	\$18.29	\$19.24
12. Feed cost per lamb	\$ 4.80	\$ 4.92	\$ 5.97	\$ 4.74
13. Initial cost per lamb	\$26.81	\$26.21	\$26.40	\$26.12
14. Number of lambs lost	0	0	0	0