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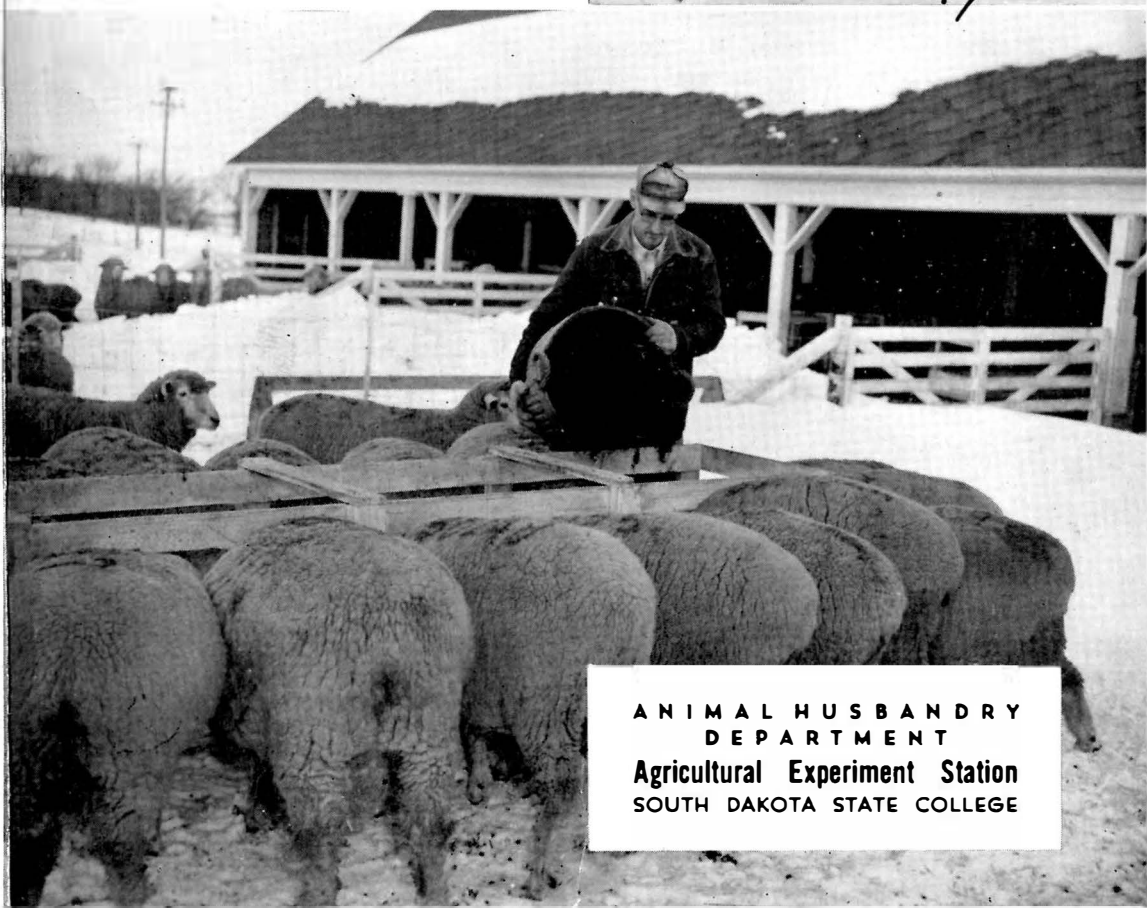

ANIMAL HUSBANDRY DEPARTMENT
Agricultural Experiment Station
SOUTH DAKOTA STATE COLLEGE

Alfalfa Hay, Alfalfa Silage and Corn Silage
FOR FATTENING LAMBS

R. M. JORDAN[1]

ROUGHAGES constitute a high percentage of a lamb fattening ration (50 percent or more). Feeding the most efficient forage will therefore play a major role in reducing the cost of fattening lambs. With the advent of modern forage cutters, stacked silage, and the more extensive use of trench and upright silos, considerable interest has been expressed as to the feeding value of alfalfa silage compared to alfalfa hay or corn silage.

In order to compare the feeding value of alfalfa silage with alfalfa hay or corn silage, three feeding trials were conducted by the South Dakota Agricultural Experiment Station.

How the Trials Were Planned

The feeding plan of the three trials (Trial I, fall 1951; Trial II, spring 1952; and Trial III, fall 1953) was such that a direct comparison of the three types of roughage was possible. In all three trials the lambs were divided into three lots. In addition to a full feed of shelled corn and a small amount of protein supplement, one lot received alfalfa hay, the second alfalfa silage and the third corn silage. In addition, approximately one-half pound of alfalfa hay was fed per lamb daily to the lots receiving either alfalfa silage or corn silage, inasmuch as most lamb feeders feel that some dry roughage should be provided the lambs in addition to silage.

The same amount of protein supplement was supplied to all lots in each trial even though it was recognized that the alfalfa hay and the alfalfa silage provided considerably more protein than the corn silage. This feeding plan offered the possibility of a direct comparison of the three types of roughages when fed with a full feed of corn. However, it did not give credit for the higher protein content in the alfalfa hay and alfalfa silage.

The lambs used in all three trials were good to choice western feeder lambs and were sheared prior to being placed on the experiment. They were housed in a shed with access to small outside lots. Fresh water, salt, and a mixture of salt and bonemeal were provided at all times.

Quality of the Feeds Fed

The alfalfa hay that was fed varied in quality betwen trials. In the first trial the hay was green and leafy; in the second and third trial it was somewhat brown in color, stemmy and contained a scattering of bromegrass and blue grass.

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The alfalfa silage fed in the first two trials was from the same stack. It was stored in a pile made by blowing the chopped green forage into a corn crib enclosure. The surface of the pile, to a depth of about one foot, spoiled and molded and was not fed. The inner portion of the stack was of excellent color and had a satisfactory odor. The alfalfa silage fed in the trial conducted in 1953 was stored in a concrete upright silo. All silage fed in the three trials was made from second cutting alfalfa.

The corn silage was of good quality, harvested from a field that would have yielded 30 bushels of corn per acre.

Table 1 shows the chemical composition of the alfalfa silage and corn silage that was fed. The more complete analysis of the silages in 1953 shows that the protein content of the alfalfa silage was almost four times greater than that of the corn silage. On the other hand, there was approximately 5 percent more nitrogen-free extract (the most digestible carbohydrates) in the corn silage than there was in the alfalfa silage.

Table 1. Chemical Composition of Silages Fed*

	Alfalfa Silage		Corn Silage	
	1951-52	1953	1951-52	1953
	%	%	%	%
Moisture	75.6	63.8	74.1	68.4
Ether extract	—	1.6	—	1.1
Crude fiber	—	8.5	—	6.5
Protein	4.2	8.0	1.5	2.1
Ash	—	3.4	—	1.9
Nitrogen-free extract	—	14.8	—	20.0

*Chemical analysis based on sample taken during feeding period.

Results of the Feeding Trials

The results of three years of experimental feeding are given in Table 2.

In the first trial the rate of gain of lambs receiving alfalfa hay was 0.41 pound as compared to 0.37 pound and 0.39 pound per lamb daily for the lambs fed alfalfa silage and corn silage, respectively. It was noticed during the trial that the lambs on alfalfa silage had a greater apparent appetite and cleaned up their feed in a shorter period of time than the lambs receiving corn silage. The lambs that consumed alfalfa hay as roughage required a little less feed per 100 pounds of gain than those in Lots II and III. This is largely due to their slightly faster gains which were not accompanied by an increase in feed consumption. Therefore, the cost of their gains was less—$14.90 for 100 pounds of gain for Lot I, $16.46 for Lot II and $15.51 for Lot III.

The feed prices used in calculating the cost of 100 pounds of gain were current for the year 1951 (Table 2). However, an accurate price for alfalfa silage or corn silage is difficult to determine as production costs and quality of silage vary from farm to farm. If alfalfa hay at $20 a ton contains about 2½ times as much dry matter as alfalfa silage, a more accurate price figure in comparison to alfalfa hay would be about $8.00 a ton. Furthermore, the price used in this report for alfalfa silage does not include the silage that was spoiled and therefore not fed. Losses in stacked silage may account for 25 to 50 percent of the

Table 2. Summary of Three Feeding Trials with Alfalfa Hay, Alfalfa Silage or Corn Silage, 1951, 1952, 1953

	Oct., Nov., Dec., 1951			Jan., Feb., Mar., 1952			Oct., Nov., Dec., 1953		
	Alfalfa Hay Lot I	Alfalfa Silage Lot II	Corn Silage Lot III	Alfalfa Hay Lot I	Alfalfa Silage Lot II	Corn Silage Lot III	Alfalfa Hay Lot I	Alfalfa Silage Lot II	Corn Silage Lot III
Number of lambs	23	24	25	22	22	21	25	24	25
Days fed	91	91	91	70	70	70	86	86	86
Average initial weight, lbs.	64.4	62.5	62.3	82.0	81.5	79.5	67.7	65.2	66.0
Average final weight, lbs.	101.2	96.3	97.3	109.0	116.9	113.8	103.4	104.2	104.0
Average gain per lamb, lbs.	36.8	33.8	35.0	27.0	35.4	34.3	35.7	39.0	38.0
Average daily gain, lbs.	0.41	0.37	0.39	0.40	0.50	0.49	0.42	0.45	0.44
Death loss	3	1	1	0	1	0	0	1	0
Average daily feed consumed, lbs.									
Grain	1.20	1.26	1.21	1.39	1.50	1.45	1.55	1.48	1.49
Hay	1.48	0.77	0.79	1.35	0.73	0.71	1.45	0.52	0.48
Silage	———	1.90	1.90	———	2.44	2.30	———	2.40	2.39
Protein Supplement	0.2	0.2	0.2	0.1	0 1	0.1	0.1	0.1	0.1
Feed per 100 lbs. gain, lbs.									
Grain	296.7	335.0	314.5	361.4	297.6	296.7	373.5	326.7	337.1
Hay	353.0	207.0	204.4	349.5	144.6	145.7	349.4	114.8	108.6
Silage	———	514.0	489.0	———	483.2	470.1	———	529.8	540.1
Protein Supplement	46.9	53.6	51.4	24.8	19.7	20.0	24.1	22.1	22.6
Selling price	$27.00	$27.00	$27.00	$26.00	$26.00	$26.00	$23.60	$23.60	$23.60
Yield, percent	50.2	49.9	50.3	49.7	50.2	50.1	51.7	50.5	49.6
Feed costs per 100 lbs. gain	$14.90	$16.46	$15.51	$15.58	$12.81	$12.86	$15.90	$13.64	$13.94
Carcass grade*									
Prime	19	22	21	17	18	17	4	8	3
Choice	4	2	4	5	4	4	7	9	16
Good	—	—	—	—	—	—	1	—	—

Feed prices used: Corn $1.68 per bushel; alfalfa hay $20 per ton; alfalfa or corn silage $6 per ton, and soybean oil meal $100 per ton.

*Not all lambs fed were slaughtered in 1953.

silage harvested, thus increasing the cost per ton of silage fed.

The results of the second trial, conducted during the spring of 1952, showed that the lambs receiving alfalfa hay did not gain as fast as those receiving either alfalfa silage or corn silage. The lambs fed alfalfa hay gained 0.40 pound per lamb daily as compared to 0.50 and 0.49 pound per lamb daily for the lambs on alfalfa silage and corn silage, respectively.

As in the previous trial, the lambs fed alfalfa silage were easier to get on feed and showed slightly greater appetite than the lambs receiving corn silage.

The results of the second trial were contrary to the first trial. This may be accounted for by the lower quality hay fed in the second trial. The feed required, and consequently the cost for 100 pounds of gain for the lambs fed alfalfa silage or corn silage, was considerably less than for the lambs consuming alfalfa hay. This was largely due to the greater rate of gain by the silage-fed lambs. There was little or no difference in the carcass grade in any of the lots nor was there any

consistent difference in the carcass yield of the lambs in the various lots.

The results of the third trial conducted during the early winter of 1953 follow quite closely the pattern which was evident during the second trial. The lambs receiving alfalfa hay gained 0.42 pound per lamb daily as campared to 0.45 and 0.44 pound for the lambs receiving alfalfa silage or corn silage, respectively. The feed costs per 100 pounds of gain were $15.90 in Lot I, $13.64 in Lot II, and $13.94 in Lot III.

While only 0.1 of a pound of protein supplement was fed per lamb daily in the second and third trials, as compared to 0.2 of a pound fed during the first trial, the amount of protein fed to the lambs receiving corn silage was sufficient to meet their requirements and the amount of protein fed to the lambs receiving alfalfa hay or alfalfa silage more than met their protein requirements.

In two out of three trials, greater and more economical gains were made when either alfalfa silage or corn silage constituted the major portion of the roughage than when alfalfa hay was the only roughage fed.

Comparison of alfalfa silage with corn silage showed that when the same amount of protein supplement was added to an alfalfa silage ration as to a corn silage ration, there was little or no difference in rate of gain between the two lots. In all three trials, lambs receiving alfalfa silage showed slightly greater appetite than was the case when corn silage was fed.

The ration fed did not affect the selling price or slaughter grade and yield of the lambs in any of the trials. If a lamb feeder has an abundance of either alfalfa or corn silage, or can put up either type of silage more economically than hay, he can use large amounts of silage as the roughage in a lamb fattening ration in place of hay. On the other hand, the differences in rate of gain, feed efficiency and cost of gain between lambs receiving silage and lambs receiving alfalfa hay are not sufficiently great to warrant changing from hay to silage for these differences alone.

Summary

Three experiments were conducted to study the relative value of alfalfa hay, alfalfa silage, and corn silage as roughages in lamb fattening rations. In two out of three trials, lambs receiving alfalfa or corn silage made slightly greater gains than lambs fed alfalfa hay. In all three trials the difference in rate of gain between lambs receiving alfalfa silage and lambs receiving corn silage was very slight, and for all practical purposes it could be considered the same. Lambs receiving alfalfa silage showed slightly greater appetite and were easier to keep on a full feed than those receiving either alfalfa hay or corn silage. Carcass grade and yield and price per 100 pounds were not affected by the ration fed.