

The Agricultural Experiment Station

OF THE

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RATION EXPERIMENT WITH LAMBS

1906-07, 1907-08.

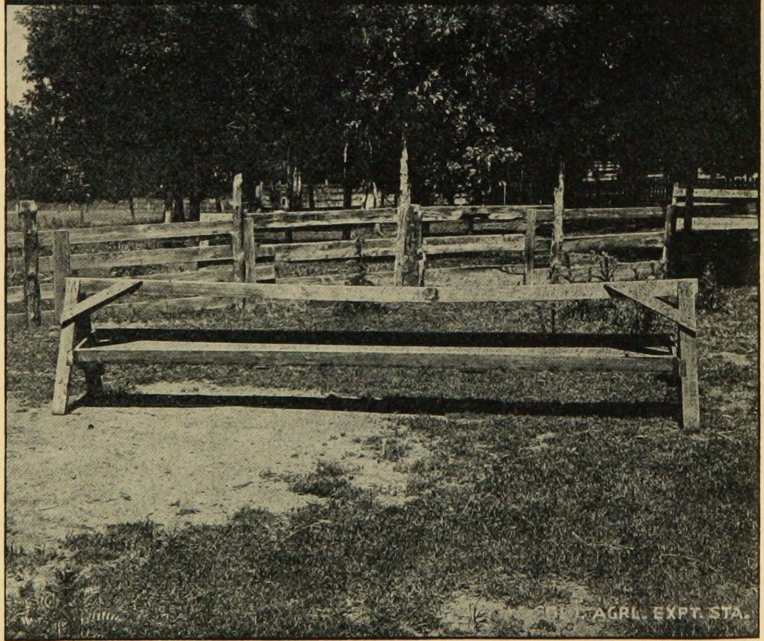
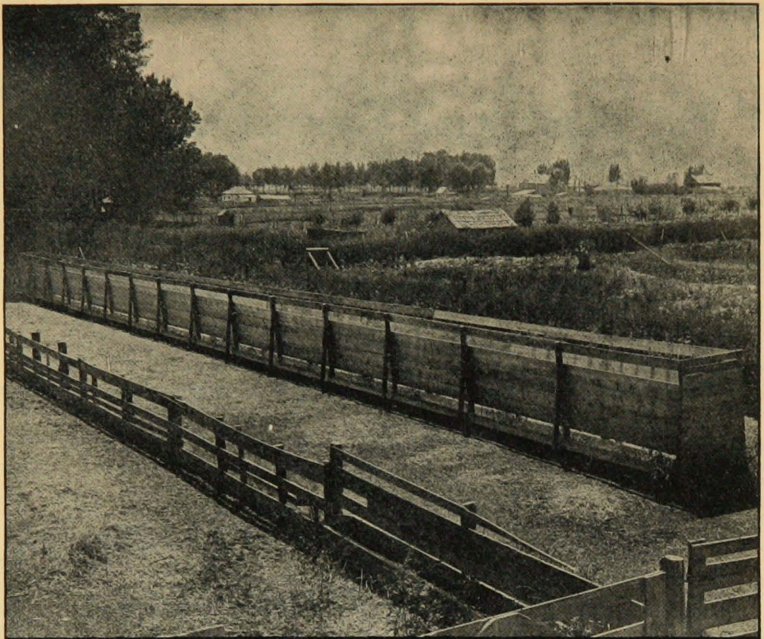
SELF FEEDERS FOR HAY

BY

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AND

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Upper—Self Feeders For Hay.
Lower—A Type of Grain Trough.

RATION EXPERIMENT WITH LAMBS.

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INTRODUCTION

This bulletin covers two winters' work with lambs done under the direction of W. L. Carlyle. The first winter's work, on Cut Hay versus Whole Hay, was carried out by H. M. Cottrell, and the second winter's work on Cut Hay versus Whole Hay, and on Self Feeders for Hay compared with Old Style Hay Racks, was carried out by the writer, G. E. Morton.

CUT HAY VERSUS WHOLE HAY—ALFALFA—FIRST TRIAL

The Fort Collins district furnishes an excellent field for the study of the lamb feeding industry. Because of the large numbers fed, and the high ranking of the finished lambs on Eastern markets, feeders are unusually alert in their search for means of reducing the cost of production. One of the questions frequently put to live stock men of the College and Station has been concerning the value of cutting alfalfa hay into short lengths. There is considerable waste in feeding whole hay to sheep as they reject quite a large percentage of the stems. There is no doubt that cutting the hay causes sheep to eat it more closely, but the question of interest is whether enough saving is effected by the cutting to reimburse the feeder for the cost of cutting.

The trial here reported was made with grade Shropshire lambs from the Idaho range. The lambs were fed whole hay and corn for a period of seven weeks, and were then put upon experiment, one lot being fed whole hay and the other fed hay run through an ordinary feed cutter, and cut to 1/8 of an inch in length.

TABLE I.
TOTAL WEIGHTS AND GAINS—SIX WEEKS
Dec. 1st, 1906, to Jan. 12th, 1907—125 Lambs in Each Lot

Lot No	Weight at Beginning (lbs.)	Weight at Close (lbs.)	Gain in Weight (lbs.)	Total Feed Consumed, (lbs.)		
				Corn	Alfalfa Hay	Oil Meal
A Whole Hay	12,635	14,256	1621	7785	24,592	140
B Cut Hay	12,533	13,948	*1505	7903	10,893	140

*Gain shown by final weight plus 90 lbs., weight of lamb which died.

The weights and gains made by the two lots, as shown in the table, are very closely alike. The amounts of corn and oil meal fed the two lots were also nearly equal. But the hay eaten by the lot fed whole hay was over double that eaten by the lot fed cut hay. Table II shows how this effects the feed required for 100 pounds of gain and the cost of gain. There was only one pound difference in the average gain per head made by the two lots of lambs in six weeks.

TABLE II.

FEED FOR GAIN AND COST OF GAIN—125 LAMBS IN EACH LOT

Lot No.	Ration	Average Gain Per Head, Six Weeks, lbs.	Pounds of Feed For 100 Pounds Gain			Cost of Feed For 100 lbs Gain*
			Corn	Hay		
A	Corn, Alfalfa Hay, Whole, on Ground	13	478	1511	8.6	\$3.73
B	Corn, Alfalfa Hay, Cut, on Ground	12	525	724	9.3	7.61

*NOTE—Corn at 1 cent per lb., Alfalfa Hay at \$5.00 per ton, Cut Hay at \$6.00 per ton, Oil Meal at 2 cents per lb.

FEED FOR GAIN

The lot fed whole hay required 47 pounds less corn for 100 pounds gain than the lot fed cut hay, but ate 1511 pounds of hay for every hundred pounds gain, while the cut hay lot ate only 724 pounds of hay for each 100 pounds gain. This is a marked difference.

COST OF GAIN

The prices, from which the costs given in the above table were computed, are not the exact prices of the feeding stuffs at the time the experiment was carried on; but they are round numbers, and changing the prices of feed stuffs in this instance could not greatly affect the ratio between the figures for the two lots. This experiment shows a considerable saving by using cut hay, although the cost of feed for 100 pounds of gain in either case is so high as to be almost prohibitive. A partial explanation of this may be found in the fact that the fleeces of the lambs were trimmed preparatory to showing at the Western Stock Show, causing a shrinkage in the weight of the lambs during the fourth week. With Lot B this shrinkage amounted to a loss of 252 pounds for the week, or about 2 pounds per head. The most of this shrinkage was regained the following week, however, as shown by the gain of 529 pounds for that week, or over five pounds per head. So we cannot look for an explanation of the high cost in this shrinkage. But considering the feed given the whole hay lot, we find that they ate on an average 4.7 pounds of hay per head each day, an enormous amount. This would indicate very poor hay or an unnecessary waste of good hay, so that in either case, one would not be justified in reaching the conclusion that the economy shown by the table would ordinarily follow the use of

cut hay. In view of the unusually heavy consumption of whole hay, a series of experiments along the same line is necessary before a conclusion is warranted. The trial reported below is the second in a series bearing upon the same problem.

CUT HAY VERSUS WHOLE HAY, ALFALFA, SECOND TRIAL

In this trial, self feeders for hay were used, and if there be economy in the use of cut hay, it should appear under these conditions; for the self feeder should protect fine cut hay and leaves from staling and from being blown away by the wind even to a greater degree than they protect whole hay, with the following exception. If there are frequent wet snows, these serve to cause greater waste of cut hay than of whole hay when self feeders are used, because the cut hay dries out less readily than the whole, and so becomes less palatable.

In the following table, Lots I and II are the Lots to be compared:

TABLE A

TOTAL WEIGHTS AND GAINS—14 WEEKS

Nov. 23d, 1907, to Feb. 29, 1908—200 Lambs in Each Lot

	Lot	Weight at Beginning (lbs.)	Weight at Close (lbs.)	Gain in Weight (lbs.)	Total Feed Consumed, (lbs.)	
					Corn	Alfalfa Hay
Hay, Cut, in Self Feeder	I	11,675	19,330	7655	20,445	46,329
Hay, Whole, in Self Feeder	II	12,240	19,170	6930	20,595	41,615
Hay, Whole, on Ground	III . . .	11,813	18,555	6742	20,595	49 425

The amount of corn eaten by the two lots was practically equal. There is again a difference in the amount of hay eaten, but in the opposite directions, showing 4700 pounds of hay saved by the whole hay lot. This may be accounted for by too wide an opening in the self feeders where the lambs remove the hay, resulting in some waste of cut hay. The self feeders are in an experimental stage even for whole hay, and little is known concerning their construction for greatest economy with cut hay.

TABLE B
FEED FOR GAIN AND COST OF GAIN—200 LAMBS IN EACH LOT

Lot No.	Ration	Average Gain Per Head, 14 Weeks (lbs.)	Pounds Feed For 100 lbs. Gain		Cost of Feed For 100 lbs. Gain *
			Corn	Alfalfa Hay	
I.	Corn, Alfalfa Hay, Cut, in Self Feeder. .	38.3	267	605	\$4.48
II. . . .	Corn, Alfalfa Hay, Whole, in Self Feeder	34.7	297	601	4.47
III. . . .	Corn, Alfalfa Hay, Whole, on Ground. .	33.7	306	733	4.89

*NOTE—Corn at 1 cent per lb., Alfalfa Hay at \$5.00 per ton, Cut Hay at \$6.00 per ton.

ECONOMY

By the table above we see that the cut hay lot gained on the average of 3.6 pounds per head more than those fed whole hay. It required for 100 pounds of gain with the cut hay lot the same amount of hay and 30 pounds less of corn. This resulted in a cost of \$4.48 and \$4.47 for each hundred pounds gained by the two lots, estimating the cost of cutting hay at \$1.00 per ton. The actual cost of cutting amounts to about 50 cents per ton, but counting interest on the capital invested in machinery and depreciation in value of machinery, the cost of cutting will approximate \$1.00 per ton. Farms cutting hay for others charge even more than this.

This trial shows no economy in cutting a good quality of alfalfa hay. The hay used was well cured, first and second cutting hay. The only point in favor of the cut hay is that changes in the construction of the hay self feeders may result in a greater saving of the hay, and further trials will be made with this point in mind. In this trial the lambs were made to eat the whole hay about as closely as they do in a commercial feed lot, no unusual amount of stems being cleaned from their racks.

For the present the author feels justified in saying that so far as the experimental work with cut hay has gone at this Station, there is not sufficient evidence in favor of cutting hay to justify sheep feeders in putting in machinery for that purpose. The indications are that it does not pay to cut good alfalfa hay.

SELF FEEDERS FOR HAY.

The trial reported above also included a test of the value of self feeders. Lot II was fed whole hay in a self feeder and Lot III was fed whole hay in racks on the ground such as are in common use in many sections of the state.

From Table B, we find that the average gain of the two lots was 34.7 pounds and 33.7 pounds respectively; and the amount of corn required for 100 pounds gain was 297 pounds for Lot II and 306 pounds for Lot III. When we look at the amount of hay required for 100 pounds gain, we find quite a difference, 601 pounds being required by the self feeder lot, and 733 or over one-fifth more

hay required by those fed on the ground. This brings the cost of 100 pounds gain in live weight of the lambs fed on the ground up to \$4.89 compared with \$4.47 for the self feeder lot. With a higher price than \$5.00 for hay the difference would be correspondingly greater.

The self feeder racks shown in the cut of the feed yards, cost \$1.00 per running foot completed. They will accommodate about four lambs to the running foot, two on a side, as not so much space is needed at a self feeder as at the ordinary rack, not nearly all the lambs eating at one time. With hay at \$5.00 per ton, these racks saved in the present instance 42 cents for each 100 pounds gain, or about 14 cents on each lamb. With four lambs to the running foot of rack this would be a saving of 56 cents against an initial cost for material of \$1.00. With hay at \$7.00 per ton, a saving of 18 cents per head was effected. This one experiment then indicates considerable advantage for the self feeder when whole hay is fed, as the racks would pay for themselves in two seasons or less. Another trial is contemplated.

SUMMARY.

Two trials of chopped hay do not settle the question of economy in cutting the hay, but the second trial with good hay, where undue waste was not allowed shows no economy. The lambs ate more hay and less corn when the hay was cut, but the cost of 100 pounds gain was practically the same whether the hay was cut or not, with \$1.00 per ton charged for cutting.

One trial of self feeders for hay shows a considerable saving. With hay at \$7.00 per ton, the self feeders costing \$1.00 per running foot for materials, repaid their initial cost in one season, accommodating 6 lambs to the running foot.

LAMB FEEDING, 1907-1908

Bi-weekly Data, Lot 1. 200 Lambs in Lot. Ration: Corn, Alfalfa Hay, Cut, in Self Feeder

	Weight (lbs.)	Gain (lbs.)	Average Gain Per Head lbs.	Feed, lbs.	
				Corn	Alfalfa Hay
Beginning.....	11675				
2nd Week.....	14270	2595	12.984	1895	
4th Week.....	15037	767	3.832	2800	
6th Week.....	15720	683	3.418	2800	
8th Week.....	16355	635	3.173	2800	
10th Week.....	17200	845	4.225	3150	
12th Week.....	18300	1100	5.500	3500	
14th Week.....	19330	1030	5.15	3500	
		7655	38.30	20445	46329

LAMB FEEDING, 1907-1908

Bi-weekly Data, Lot II. 200 Lambs in Lot. Ration: Corn, Alfalfa Hay, Whole, in Self Feeder

	Weight (lbs.)	Gain (lbs.)	Average Gain Per Head lbs.	Feed, lbs.	
				Corn	Alfalfa Hay
Beginning.....	12240				
2nd Week.....	14695	2455	12.278	2045	
4th Week.....	15340	645	3.223	2800	
6th Week.....	15835	495	2.478	2800	
8th Week.....	16195	360	1.80	2800	
10th Week.....	17010	815	4.078	3150	
12th Week.....	18030	1020	5.10	3500	
14th Week.....	19170	1140	5.70	3500	
		6930	34.67	20595	41615

LAMB FEEDING, 1907-1908

Bi-weekly Data, Lot III. 200 Lambs in Lot. Ration: Corn, Alfalfa Hay, Whole, on the Ground

	Weight (lbs.)	Gain (lbs.)	Average Gain Per Head lbs.	Feed, lbs.	
				Corn	Alfalfa Hay
Beginning.....	11813				
2nd Week.....	13935	2122	10.61	2045	
4th Week.....	14715	780	3.90	2800	
6th Week.....	15395	680	3.40	2800	
8th Week.....	15605	210	1.05	2800	
10th Week.....	16195	590	2.95	3150	
12th Week.....	17140	945	4.723	3500	
14th Week.....	18555	1415	7.078	3500	
		6742	33.73	20595	49425

Note.—It will be noticed that the lambs made a large fill the first two weeks. This was in spite of the fact that the experiment was not begun until six days after the lambs were unloaded, the lambs being given all the hay they would eat during this time.