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Experiment Station

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Fattening Lambs---
Shelter versus Open Lot

By

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and

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CORVALLIS, OREGON

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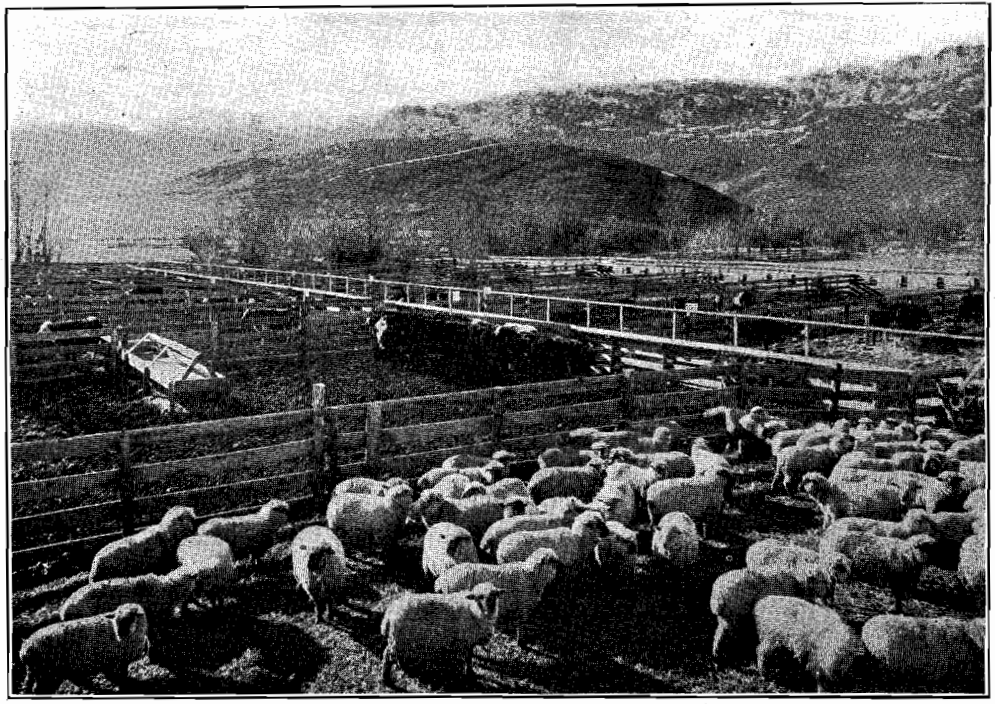

GENERAL VIEW OF SHEEP AND CATTLE YARDS, EASTERN OREGON BRANCH EXPERIMENT STATION

SUMMARY OF THREE YEARS WORK WITH 807 LAMBS

Lambs with shelter gained .30 pound per head per day.

Lambs without shelter gained .29 pound per head per day.

Lambs with shelter ate 1 percent more feed and made 5 percent more gain.

Lambs having access to a shed practically all stayed inside in stormy weather, and a majority in all weather.

The shed paid fair returns on the investment, but no profit beyond that.

Lambs fed in the open without shelter of any kind made rapid and economical gains.

OBSERVATIONS ON MANAGEMENT

The best feeder lambs weigh about 60 pounds at the beginning and 85 pounds when finished.

The best gains are made by the thrifty, blocky, black-faced lambs.

Grain is best fed unground at the rate of ¼ pound at the beginning and gradually increased to one pound.

If the grain is not very evenly distributed in the troughs, some lambs get too much and others not enough.

Lambs do not feed well when without salt, or when the water is dirty or not easily accessible.

Lambs make poor gains on poor feed.

Fattening Lambs--- Shelter vs. Open Lot

TEST NO. 1, 1914-15

In 1914 a series of tests was inaugurated at the Eastern Oregon Branch Experiment Station to obtain data on fattening lambs. The main object of these tests was to determine the value of shelter in connection with the winter feeding of lambs for market. Accordingly on December 19, 1914, a representative lot of feeder lambs, mostly black-faced, were divided into two lots, 149 in the first and 148 in the second.

Lot 1 was fed in an open feed yard, while Lot 2 was fed in a similar yard with the exception that it was provided with a low shelter-shed 16 by 50 feet in dimensions. This shed was 4 feet high at the eaves, 8 feet in the center, and was open on the west side and north end. Both lots were given their feed in the open.

The hay was fed through panels. The grain was fed in shallow troughs located in separate pens so that the grain could be evenly distributed in the troughs before the lambs were turned in. The grain was fed in two feeds, night and morning. The lambs were started on .2 pound a day of whole oats. At the end of twelve days this was increased to .3 pound. The fifteenth day one part whole barley and two parts oats were fed; on the sixteenth day one part oats and two parts barley. After that, straight whole barley was used, gradually increasing the amount until by the end of three weeks, each lamb was getting one pound a day. After this the grain was not increased, although the lambs would have eaten more had it been offered them. The hay used was all alfalfa of good quality. Fresh hay was pushed up to the panels three to four times a day.

Three times a day, morning, noon, and night, a count was made of the number of lambs under the shed. On the average about 60 percent of the lambs were under the shed early in the morning, 35 percent at noon, and 20 percent in the evening. In stormy weather practically all the lambs used the shed except while eating. The shed, while simple and inexpensive, afforded considerable protection, especially from the wind. The pen in which the shelter lot was fed, moreover, was rather better protected by buildings and board fences than was the other lot. The results of the test are shown in Table I.

TABLE I. OPEN LOT VS. SHELTER, TEST NO. 1
Dec. 19, 1914 to Feb. 24, 1915, 67 days

Lot	No. of lambs	Weight at beginning	Weight at close	Gain per head	Daily gain	Daily ration — Hay — Offered	Hay — Refused	Hay — Eaten	Grain
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Open lot	149	83.65	100.07	16.42	0.25	3.66	0.91	2.74	0.69
Shelter	148	83.44	100.20	16.76	0.26	3.76	0.97	2.78	0.70

As will be seen from the table, there was very little difference in the gains made by the two lots. The lot under shelter ate 2 percent more hay and gained 5 percent more. The lambs with shelter looked a good deal better, but the difference in gains was not great. Both lots did excellently from start to finish. The feeding period was short, but since the lambs were in good condition from the start, it was long enough to make them prime.

TEST NO. 2, 1915

The next fall, 1915, another lot of lambs was bought and the test repeated. The lambs were very good, but like those of the previous test, were rather heavy. They were fed in the same lots that were used the winter before. The feeds were also the same except that the lambs were fed whole barley from the start. They were started on a feed of one-

LOT 1, WITHOUT SHED

fourth pound a day, which was gradually increased until at the end of eighteen days they were getting one pound to the head. This amount was fed for the remainder of the test. They were of course given all the alfalfa they would eat and were in fact encouraged to eat just as much hay as possible. The results are shown in Table II.

TABLE II. OPEN LOT VS. SHELTER, TEST NO. 2

Nov. 22, 1915 to Feb. 19, 1916—90 days

Lot	No. of lambs	Weight at beginning	Weight at close	Gain per head	Daily gain	Daily ration—Hay			Grain
						Offered	Refused	Eaten	
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Open lot	130	82.6	109.9	27.3	0.30	3.47	0.44	3.02	0.90
Shelter	130	82.6	111.9	29.3	0.33	3.55	0.46	3.09	0.90

The lambs gained more than those in the previous year, but the difference between the two lots was about the same. Those fed in the open gained .30 pound a day, while those provided with a shed gained .33 pound. Those with the shelter ate about 2 percent more alfalfa than those outside. A record was kept of the number of lambs in the shed morning, noon, and night, with about the same result as in the previous year. During stormy weather practically all the lambs used the shed when they were not eating. When it was raining or snowing a majority used the shed; from a fourth to a third, however, would usually be found outside. The yard was small and so arranged that the shed was the most convenient place for them when they were not at the feed racks. The lambs in this lot were exceptionally fine, and dressed out 50.4 percent, but they were too large and the buyer was forced to sell a good many of the carcasses as yearlings at a price, of course, below that of lambs.

TEST NO. 3, 1916

In the fall of 1916 a third car of lambs was secured and a third test made. The lambs were smaller than those previously used, weighing only about 64 pounds, while those in the former tests weighed about 83 pounds. These lambs were not a choice lot and at the time of their arrival on the farm, October 24, 1915, the greater portion of them had sore mouths, a disease technically known as aptha. They looked hopeless, but by strenuous and persistent treatment they were cured in time to go into the feed yards December 22.

The test this year was almost an exact repetition of the two previous tests. The lambs were started on ⅛ pound of whole oats a day. On the fifth day this was raised to ¼ pound. On the sixth day half oats and half barley was fed, and on the seventh day whole barley. This ration was increased gradually until by the eighteenth day the lambs were getting their regular feed of one pound a day.

The results are shown in Table III.

TABLE III. OPEN LOT VS. SHELTER, TEST NO. 3

Dec. 22, 1916 to March 23, 1917—91 days

Lot	No. of lambs	Weight at beginning	Weight at close	Gain per head	Daily gain	Daily ration — Hay — Offered	Hay — Refused	Hay — Eaten	Grain
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Open lot	125	63.88	92.16	28.28	0.31	2.64	0.25	2.39	0.90
Shelter	125	63.88	92.20	28.32	0.31	2.61	0.25	2.36	0.90

The results are very similar to those of the first and second tests but show less advantage for the shelter. The entire lot under shelter gained five pounds more than those in the open. As in previous tests all lots did well from start to finish. The daily record of the number under shelter was much the same as before; that is, they made good use of the shed when it was snowing or raining, but when the weather was good a considerable proportion stayed outside. The actual amount of feed consumed was one percent less in case of the lambs with the shelter. These lambs dressed 46.1 percent, which was 4.3 percent less than those of the year before; the lambs, however, were of a more desirable size.

AVERAGE OF THREE TESTS

The three tests are summarized in Table IV.

TABLE IV. OPEN LOT VS. SHELTER, AVERAGE OF THREE TESTS

Lot	Total No. of lambs	Aver. length of feeding period	Aver. weight at beginning	Aver. weight at close	Aver. gain per head	Aver. daily gain	Daily ration—Hay—Offered	Daily ration—Hay—Eaten	Daily ration—Hay—Refused	Daily ration—Grain	Feed per 100-lb gain—Hay—Offered	Feed per 100-lb gain—Hay—Eaten	Feed per 100-lb gain—Grain
		days	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Open lot	404	83	77.22	100.79	23.57	0.29	3.24	0.52	2.72	0.84	1124.04	944.72	290.49
Shelter	403	83	77.12	101.50	24.38	0.30	3.29	0.54	2.75	0.84	1094.23	914.10	279.29

The lambs under shelter made slightly larger gains throughout, amounting to three-fourths pound a head for the entire feeding period. The amount of alfalfa actually consumed was more with the shelter lot but the difference in the amount of hay refused was probably due to some slight differences in the feeding. An unusual amount of refuse hay was taken out in order to encourage the lambs to eat the largest possible amount. The quantity of refuse hay taken out each day was largely a matter of judgment on the part of the feeder and was not always just the same.

From the standpoint of feed required per 100 pounds gain the shelter lot required 2.7 percent less hay offered, 3.2 percent less hay actually consumed, and 3.5 percent less grain.

The shed used required for its construction approximately two thousand feet of common rough lumber and the time of two men for three days. Its cost was estimated at $50 at the time it was built, but would be more than double that at the present time (1920). In three years the lambs with the shed made 382 pounds more gain, but required 1340 pounds more hay. The amount of grain was the same. With lambs at 10c a pound and hay at $10.00 a ton this would constitute a net return of $31.50 for the use of the shed for three years. It seems, therefore, that while the shed will pay fair returns, it affords no profit over interest and depreciation. Our observations indicate that the lambs used the shelter freely during wet, stormy weather, but that they were indifferent to it during cold, dry weather. The lambs fed in the open with no shelter made rapid and economical gains and were well finished at the end of the tests.

The winters during which these tests were conducted were not especially severe, but on the other hand, the feed lots were located in a cold, windy place. It would seem, therefore, that the results of these tests should be applicable to all the colder portions of the State.

MANAGEMENT OF FATTENING LAMBS

Buying Feeders. The ideal feeder lamb is a thrifty, smooth, blocky, black-faced lamb weighing about sixty pounds. In actual practice this ideal is not always obtainable, but it should be kept constantly in mind while selecting feeders. Individual lambs weighing less than fifty pounds are usually held over and marketed as yearlings. Individual lambs weighing eighty pounds or more should be ready for market without further feeding. Feeder lambs must also be thrifty and not stunted or wormy, and they should carry as much black-faced blood as possible. Late lambs and lambs from districts of rather scanty feed make good feeders, but an early lamb that has good feed all summer and is still only a feeder in the fall, very likely has something wrong with him. It should be remembered that while a standard-size double-deck car will accommodate three hundred or more feeder lambs, it will not take care of them after they are fat. Two hundred fifty in a car will be plenty after they are fat and ready for market; if exceptionally heavy and carrying a large amount of wool, two hundred may be enough.

Equipment. Feed yards should be located on dry, well-drained ground, and in most cases should be fenced dog tight. Possibly the most popular method of feeding hay is by an arrangement of panels set at right angles to each other. These panels are made of one-by-six-inch boards with a twelve-inch board on the bottom, and the second board seven inches above. This leaves sufficient space through which the lambs can feed. The hay is then pushed up to the fence from the outside. Whatever system is used the feeding should be done from the outside; teams and wagons cannot be driven into the feeder lots with safety to the lambs. The best grain trough is one about twelve inches wide, four inches deep, and placed two inches from the ground. It should also have a bar along the top to prevent the lambs from jumping into it. These troughs should be in a separate pen into which the lambs are turned after the feed has been distributed. It is important to have about the right amount of trough room. If too much, the greedy lambs get a second helping; if not enough, the weak lambs will not get their share. About twelve inches of space on one side of the trough is required for each lamb.

Plenty of good clean water and salt must be provided so that the lambs can have easy access to them at all times. In freezing weather tank heaters placed in the water troughs are of great assistance.

Feeding. If proper feed-trough space has been provided, lambs can be started on one-fourth pound of grain a day without the slightest danger. In two of our tests the lambs were started on oats, but this did not seem necessary, as the lot started on barley never gave the slightest trouble. Grinding grain is not necessary for fattening lambs, although for old ewes with broken mouths it is desirable to grind the grain, and also chop the hay. Feed troughs should in all cases be kept clean and the grain very evenly distributed in the troughs before the lambs are turned in. Fresh hay should be given three or four times a day and the refuse cleaned out once a day.

Length of the Feeding Period. A good feeder lamb will be fat in ninety days and as large as the market will stand. Very light lambs might be kept on full feed one hundred days, while extra good feeders will be ready to market in sixty days.

FINANCIAL DISCUSSION

The question of profit or loss is always a most vital one to the stockman or feeder. The feeding of lambs does not differ materially from that of other livestock and conditions are never twice the same. The three years in which these tests were conducted were favored with a steadily rising market, hence money returns were all good. The feed used in these tests returned approximately twice its market value. The data presented in this publication of most importance to the feeder are not those pertaining to the direct financial returns obtained from any particular feeding test, but rather those data pertaining to the amount of feed required to produce the desirable gains. With such information at hand the feeder is able quite accurately to forecast the cost of feeding.

The following information will be found helpful for calculating the cost of a finished lamb where a sixty-pound feeder costs $6.00, barley $60.00 a ton, and alfalfa $20.00 a ton, and the feeding period is to be

LOT 2, WITH SHED IN BACKGROUND

ninety days. The amounts of feed required and the estimated gains are based upon our experiments in feeding in the open lot, as given previously in this bulletin. The insurance is also based on these tests, in which there was a loss of 1.6 percent including losses in transit.

METHOD OF FIGURING FEEDING COSTS

Cost of 60-lb. feeder lamb @ $10 per 100 lbs.	$ 6.00
Interest on above @ 8% for 90 days	.12
Insurance @ 1.6%	.10
292 lbs. of alfalfa @ $20.00 a ton	2.92
75 lbs. of barley @ $60.00 a ton	2.25
Labor @ $6.00 a day per 1000 lambs	.05
Final cost per head	$11.44
Gain per head—26 pounds	
Final weight per head—86 pounds	
Final cost per 100 pounds—$13.30	

This means that a lamb costing $10.00 a hundredweight must, at the feed prices quoted, sell for $13.30 a hundredweight after ninety days feed, in order to pay for feed, interest, insurance, and labor. These are farm prices; if the lambs are bought or sold at more distant points, allowance for shipping costs must be made. In order that we may see at a glance the approximate cost of a finished lamb under a range of prices for feeder lambs, hay, and grain, the following cost chart has been prepared.

COST CHART

The cost per hundredweight of finished lambs

When prices of feeder lambs per cwt. are	$ 7.50	$10.00	$12.50	$15.00
When feed prices are—	Cost of Finished Lambs			
Barley $60.00 a ton Alfalfa $20.00 a ton	$11.49	$13.30	$15.10	$16.91
Barley $45.00 a ton Alfalfa $15.00 a ton	9.99	11.80	13.60	15.41
Barley $30.00 a ton Alfalfa $10.00 a ton	8.49	10.30	12.10	13.91

It is apparent that in practically all cases the finished lamb, in order to pay out, must sell for more per hundredweight than his original cost as a feeder. This he will do on a steady market on account of his higher dressing percentage and the higher quality of the mutton. Normally a fat lamb is worth from $1.50 to $2.00 more to the hundred pounds than he was as a feeder. A further study of the chart shows that with high-priced feed, lambs costing $7.50 must be sold for $11.49, a margin of $3.99, which is more than we could usually expect. A feeder costing $15.00, however, in order to pay out, needs to be sold for only $16.91, or a margin of $1.91. On the other hand, with feeder lambs at $15.00, barley at $30.00 and alfalfa at $10.00 the finished lamb may be sold for $13.91 or $1.09 less to the hundredweight than he cost. This combination of high-priced lambs and cheap feed, however, is a condition that seldom occurs.

The profit or loss in any one year of course depends very largely upon market conditions during the feeding period. Just what this will be, no one is able to forecast. As a rule, however, we expect lamb prices to be a little stronger at the end of the winter than they are in the fall, but this is uncertain and on the average does not amount to a great deal. In the long run, the fluctuations counterbalance. The feeder must depend for his profit upon the normal margin between the prices of feeder lambs and of fat lambs.