

IDAHO AGRICULTURAL EXPERIMENT STATION

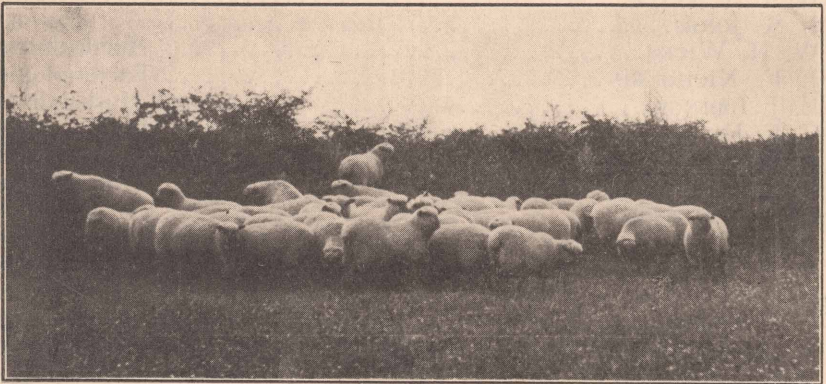
MOSCOW, IDAHO

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DEPARTMENT OF ANIMAL HUSBANDRY

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LAMB FEEDING AND SHEEP  
HUSBANDRY IN IDAHO



BY

W. L. CARLYLE

E. J. IDDINGS

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# IDAHO EXPERIMENT STATION

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The regular bulletins of this station are sent free to persons residing in Idaho who request them.

# LAMB FEEDING AND SHEEP HUSBANDRY IN IDAHO

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## INTRODUCTION

The numbers and values of various kinds of live stock on January 1, 1913, are reported by the Bureau of Statistics, United States Department of Agriculture. This estimate gives Idaho fifth place in number of sheep among the states of the Union, with 2,957,000 head. These sheep, from the same source of information, are valued at \$11,804,000.00, which exceeds the total value of any other class of animals except horses. Sheep Husbandry, though conducted largely under range conditions, is chief among the live stock industries of Idaho. Development and extension of sheep husbandry in the state, must follow two principal lines, viz: lamb feeding and the keeping of more sheep on the farm.

During the past year a great many letters of inquiry, many more than ever before, have come to the Idaho Experiment Station requesting first, detailed advice as to relative value of native feeds for, and methods to pursue, in lamb feeding; and second, information as to the breeds best adapted to the farm and the feeding and management of a small flock. It is the purpose of this bulletin to give such information as is possible concerning lamb feeding by reporting in detail data secured in two feeding experiments with a total of 813 lambs, and also to supply information as to breeds and management by briefly discussing the chief characteristics of the more popular types and breeds and outlining the essential features of successful flock management.

## A FUTURE FOR SHEEP

Sheep raising in America has passed through many important changes. In the earlier days of the industry sheep were kept largely for wool, and those types showing the heaviest and finest quality of fleeces were as a rule most popular. Mutton was then commonly regarded as inferior meat of uncertain flavor and palatability. Gradually these old prejudices against the eating of the meat of sheep have given way, and mutton has come rapidly into public favor.

The receipts of sheep at the Union Stock Yards of Chicago show

clearly the increasing demand for sheep for food purposes. A quarter of a century ago, in 1888, 2,611,543 head of cattle were received at the yards. Last year 2,652,342 were received, or an increase of but 1.6 per cent. In 1912, 7,180,967 hogs were received as compared with 4,921,721 in 1888, an increase of 46 per cent. These increases are unimportant as compared with those of sheep. The receipts of sheep in 1888 were 1,515,014 and in 1912, 6,055,546 head. This is an increase of 4,540,532 head or approximately 300 per cent.

It is also of interest to note that very few sheep have been found to be affected with any infectious disease when slaughtered. Agents of the Bureau of Animal Industry inspected more than thirteen million carcasses of sheep in 1911, and found no evidence of tuberculosis in a single carcass. Large numbers of meat consumers have turned to mutton on account of the high cost of beef and pork in recent years and in the change, made temporarily for economy, have acquired the "mutton chop" habit and have been educated to the healthfulness, high nutritive value and relative cheapness of mutton for a part of the human diet.

Industrial changes and uncertainty as to tariff policies have rendered wool values less certain and stable, and have correspondingly given prominence to sheep as meat producers. There is little danger that wool values will fall so low as to prevent the fleece from meeting the larger portion and frequently all of the cost of the ewe's keep on the average farm. The shortage in beef cattle cannot be overcome for several years, and hog cholera and other unfavorable factors in the hog business, will tend to maintain an equilibrium in pork production. It is very evident to those who are in touch with the situation that the Idaho farmer is certain to find his mutton in pretty fair demand.

#### WHY FEED LAMBS

The lamb is one of our most economical producers of edible meats. In a comparison of lambs and steers coming two years old at the Iowa Experiment Station it was found that the average steer required 8.9 pounds of dry matter for each 100 pounds of gain while the lamb required but 7.37 pounds. The cattle consumed 19.6 pounds of dry matter per 1000 pounds of live weight as compared with an average of 29.07 by the sheep. The daily gain of the sheep was 3.73 pounds per 1000 pounds of live weight and the cattle was 2.14. The sheep, therefore, ate 48 per cent more than the cattle and gained 75 per cent more. Lambs are popular with experienced feeders because of their established position as good feeders and economical producers of gain. Figures compiled by the Idaho Wool Growers' Association show a total shipment out of Idaho in 1912 of 5121 cars of sheep from Oregon Short Line Railroad points alone. Assuming that the cars were double decked and each carried 200 sheep, approximately one million head of sheep were shipped from the state over this one

railroad. Some are driven from the state and some are shipped over other lines, also many of the cars shipped in early fall contained 250 to 300 head, making a total of perhaps 1,500,000 head for the year taken from the state direct to market or to feed lots in other states. In past years the greater portion of this great band has been shipped direct from grass and a comparatively unimportant per cent has annually received grain and been sold for grain-fed prices.

Our farms produce an excellent quality and very large yields of small grains, well-adapted for feeding lambs for market, and, we have no local market for thousands of carloads of the finest quality of alfalfa hay, yet we have been shipping our lambs to market as grass-fed, or to distant feedlots to be finished on grains as high priced as our own and on hay that costs from one-half more to four times as much as it may be secured for in Idaho. Not only does the feeder of Colorado, Nebraska, and as far east as Michigan, use the Idaho lambs as a medium for marketing the grain products of his farm, while our farmers are in many cases shipping bulky fodders and grains at high freight rates and low prices, and in addition the foreign feeder has left the lamb manure which is a considerable item in securing heavy crop yields and an important factor in keeping up soil fertility.

During the last two years alfalfa hay in the large alfalfa growing sections of the state has had a farm value of from \$3 to \$5 per ton. In the Idaho experiments of 1910-11, with the lambs shipped under unfortunate conditions, the hay brought \$3 and almost the entire fertilizing value of both hay and grain fed was left in the feedlot for use on the farm. This was an unfortunate year, however, for feeders everywhere. It is estimated that the professional feeders of Northern Colorado, who annually feed six hundred thousand to one million lambs, and who as individuals have an experience of from three to twenty years in the business, lost that year an average of \$1 for each lamb fed. The same year the lambs fed by the Purdue Experiment Station of Indiana caused a loss to the Station varying from \$0.31 to \$1.56 per hundredweight in the different lots fed.

In the Idaho feeding work of 1912-13, the hay disposed of through the lambs brought \$8.73 per ton by a strict method of charging all expenses to the feeding operations; and as much as \$11.17 per ton by considering the water supply as belonging to the farm and all labor charges as offset by value of the manure. Some feeders in the southern part of the state, who kept records and who fed largely on hay with a short grain feeding period for finishing, claim \$20 to \$25 per ton for hay disposed of through the lambs.

We need to feed our own lambs in Idaho because, at present we are shipping the raw product and permitting another to secure the finishing profit. Furthermore, we need to build up a lamb feeding industry to furnish us a farm market for our small grains and cheap legume hays. Finally, we need to retain on the farm by lamb or

other animal feeding, the fertility now in some districts largely lost to the farms of Idaho by shipping bulky crops to distant markets.

Our forest reserves and other mountain pastures are rich and of high fattening value. Many of our sheepmen find that the bigger and more thrifty lambs come from these pastures in the fall quite fat. Such lambs are cut out and shipped to market as grass-fattened. Under present conditions it is probably wise practice to ship a large percentage of the fattest lambs. In a large number of cases, however, the sheepman's and the packer's ideas as to the proper finish for lambs ready to kill do not coincide, and a large portion of the lambs shipped as grass-fed are cut back to be sent to the country for a 50 to 90-day feeding period in eastern feed lots. This fact is clearly proven by Bulletin 162 of the Purdue Experiment Station, a 40-page publication re-



Shropshire ewes owned by Knollin and Finch, Soda Springs, Idaho. Large flocks of pure bred sheep are pastured on Idaho summer range.

porting results in feeding 420 lambs, all of which were Idaho bred lambs, purchased as feeders in the Chicago market. In this state we have more sunshine, drier feedlots as a rule and less shelter is required as compared with feeding conditions in the central states. Such lambs as above mentioned should be kept in Idaho until properly finished on home-grown feedstuffs.

The cutting out process on the range leaves behind a large number of thin lambs of various sizes, that can be most profitably marketed when fat. It is the last named class of lambs that have been used in the lamb feeding experiments hereafter described.

Another reason why the farmers of Idaho should feed lambs is that the sheepmen of Idaho produce as good a feeder type as can be grown anywhere in America. The sheep owners of the West have been progressive and have expended a great deal of money for improved blood to grade up their flocks. Wool has not been neglected but especial attention has been paid to mutton, by securing pure-bred rams principally of the Shropshire, Hampshire, Cotswold and Lincoln breeds. The lambs come into the world backed by mutton parentage. In most parts of the sheep raising districts, the grass starts early in the spring enabling the ewe to suckle her lamb properly. In mid and late summer the flocks seek the higher valleys and mountainsides of the forest reserves and unreclaimed lands where sweet, rich grass is found in abundance and the lambs grow strong and healthy. Blood and environment produce big-framed, vigorous, quickly grown lambs of well developed mutton type and ideal as feeders.

For years Idaho bred lambs have been especially in demand by the expert feeders of Colorado and other feeding districts. At the National Stock Show at Denver, Colorado, and at the International Stock Show at Chicago, Idaho grown lambs have won repeatedly in their finished form in competition open to all America. With the best of lambs and cheap feeds of quality, home feeding certainly needs to be encouraged and developed.

#### A PLACE FOR SHEEP ON THE FARM

In the central and far eastern states small flocks of sheep are found on a large percentage of the farms. It has been found that ewes and lambs on the farm will make use of and do well on some farm wastes and feed material unsuited to other animals; that sheep consume and keep down 90 per cent of the various farm weeds, are valuable in destroying brush and undergrowth, will make good returns from rough and unproductive land and return the farmer a fleece worth \$1 to \$2.25 and a lamb that can be sold at from \$3.50 to \$7 in late summer or fall, and the farmer does not greatly miss the feedstuffs that go to produce these readily marketed products.

There is a similar field for small flocks in Idaho and other north-western state. In the northern and central parts of the state, summer fallows foul with weeds, could be cleaned up and made to yield a profit through sheep. Lanes, rough lands, aftermath following the hay crop and wastes of the grain fields are often of little value, but could be utilized to great advantage by sheep. Roughage for keeping a small band of ewes over winter is usually abundant on every farm. Great areas in these sections do not grow enough mutton to enable the local butcher to depend upon it for even a reasonable percentage of his necessary supply.

In southern Idaho are grain and hay fields to be cleaned up, sugar beet leaves with a feeding value for sheep of \$3 to \$5 per acre,

native pastures often contiguous to the irrigated ranch, and blue grass and various mixtures of grasses that can be kept growing vigorously until late in the fall by irrigation. On the irrigated experimental farm at Gooding, Idaho, conducted in co-operation by the Division of Irrigation Investigations of the U. S. Department of Agriculture and the Idaho Experiment Station, one-half acre of irrigated mixed pasture has been set aside for sheep pasture. During the summer of 1912 this pasture easily carried six mature Lincoln rams and is now carrying eight ewes and five lambs.

George V. Leighton of the Boise Valley has received as high as \$42 per acre annual cash rental for blue grass and white clover pasture grazed by sheep.

Sheep diversify the farming system, giving the farmer an added source of income, and, as in the lamb feeding, benefits to the land must be recognized as important. There is a double source of income from the wool and the lambs, coming in at different seasons of the year. The western states are practically free from the many serious handicaps found in the Mississippi valley and by far eastern sheep owners. In those sections dogs and internal parasites in many cases almost prohibit the rearing of sheep. Dogs have been known to bother in but few parts of the west. In many sections coyotes are something of a menace but a tightly fenced yard for the sheep at night is as a rule adequate protection. Internal parasites, that have driven sheep off of many farms in the blue grass regions, are practically unknown here.

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## FEEDING EXPERIMENTS

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### PURPOSE

The experiments of 1910-11 and of 1912-13 were carried on with the idea of testing out the value of our alfalfa hay in lamb feeding and to ascertain the feeding value of Idaho grown grains.

### METHODS AND EQUIPMENT

The lambs of both feeding trials were fed in the open without protection of any kind from the weather. Sheds are to be recommended but are not necessary for feeding in most sections of the state. At Caldwell, where the above mentioned lambs were fed, a tight board fence built to shut out prevailing winds and storms in fall and early winter would have given considerable protection at times, and will be built for future feeding operations.

An outline of preparations made for the 1912-13 experiments will suffice to make clear methods to be followed and equipment



needed. These lambs were kept in lots made of panels set zigzag, so that each pair of panels met at a right angle and the total number of panels used were so arranged as to form an enclosed yard. One panel fence was 458 feet and the other 462 feet long. These two enclosures were used for 251 and 254 lambs respectively. There was more room than was necessary or advisable. When space is sufficient



View of Caldwell feed yards, December 1912, showing form of panel used and method of feeding hay in experiments of 1910-11 and 1912-13.

to encourage it the lambs gather in groups and do considerable running and playing, thereby getting too much exercise for most economical fattening and wasting too much energy. In the spaces mentioned 650 to 700 lambs could have been fed without overcrowding.

The panels or hurdles that enclose the Caldwell Station feed yards are fourteen feet long and three feet one inch in height. Ready cut material for making each panel is as follows:

- 1 piece of 1x12, 14 feet long.
- 2 pieces of 1x6, 14 feet long.
- 3 pieces of 1x6, 3 1-2 feet long.
- 25 to 30 6d nails.

This provides for three horizontal boards, and a vertical binding slat at each end and one in the middle of the panel. The 1x12 is used for the bottom horizontal board and the vertical slats should be extended five inches below it. In erecting the panels into a fence these 5-inch lengths are sunk into the ground to make the enclosure more firm. Above the 1x12 is an eight-inch space through which the lambs reach

in eating hay, and then in turn are a 1x6, a five-inch space and another 1x6, making the total heighth of hurdle before mentioned.

The two enclosures mentioned above were made contiguous. On the dividing line were placed water troughs fourteen feet long and a salt trough fourteen feet long. Both lots used the same troughs for water and salt.

Grain was fed in a small separate enclosure into which either group of lambs could be turned by opening a gate-panel arranged conveniently for the purpose. By feeding each lot in turn, one small enclosure and a minimum number of troughs were made to serve both bunches of lambs. A cut of the trough used will make clear the general features of construction. It is important that the trough swing free on a bolt or spike at each end. This permits the trough to be turned over after each time of feeding to empty out the refuse matter from the feed and to protect the trough during the interval between feeding periods from rain, dust or snow. Lambs do much better if given hay, grain and drinking water in the cleanest manner possible. A bill of material of various sizes and lengths to build a grain feeding trough of size to accommodate twenty lambs, follows:

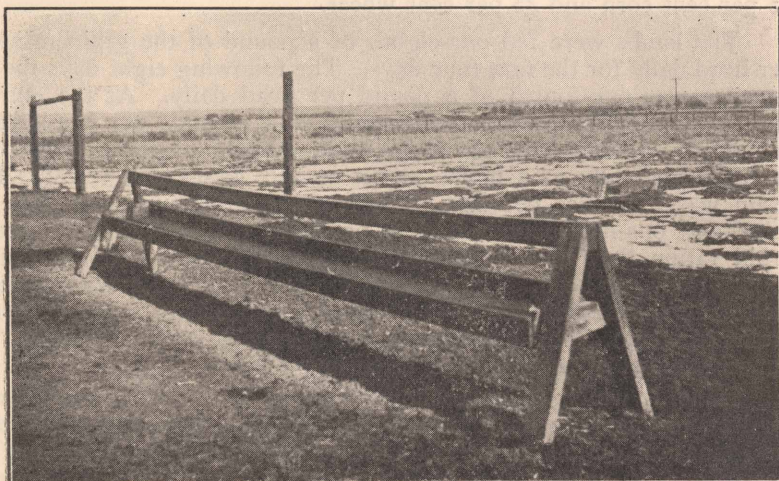
- 1 piece of 2 x 4, 14 feet long.
- 4 pieces of 2 x 4, 2½ feet long.
- 2 pieces of 2 x 4, 10 inches long.
- 1 piece of 1½x12, 14 feet long.
- 2 pieces of 1 x 4, 14 feet long.
- 2 pieces of 1 x 4, 14 inches long.
- 2 bolts ¾x6.

The hay was fed on the ground on the outside of the panels, the lambs reaching through the lower opening in the panel to obtain it. In good weather hay for two to five days feeding can be arranged in shocks at convenient intervals around the enclosure. From these piles the lambs are supplied with fresh hay morning and night. At noon no new supply is given, but that left from the morning feed is turned enabling the lambs to get desirable portions beyond their reach or covered up. Stems refused or hay spoiled in the stack or made unpalatable by exposure to rain or snow should be removed each four to ten days.

The enclosures should be bedded with straw when the lambs are put in and fresh straw supplied as often as necessary to keep the lambs clean and dry. At the end of from 90 to 120 days, this straw and the droppings will be found to make a compact covering for the entire yard space of from six to ten inches of very rich manure. The panels should be removed and piled up after each year's feeding. This makes it more convenient to remove the manure, helps preserve the hurdles and enables the space to be used for the greater portion of the year for other purposes.

## FEED PRICES

Feeds used in the following experiments are charged at prices that are considered a fair average, if bought in ton lots on the farm, during the period of 1910-13. In order to easily compare results se-



Trough used in feeding grain.

cured in the two experiments uniform prices are used in figuring cost of feeding stuffs. Feeds are, therefore, charged, as follows:

Alfalfa Hay, per ton.....	\$5.00
Corn, per hundredweight.....	1.40
*Wheat, per hundredweight.....	1.20
Barley, per hundredweight.....	1.00
Oats, per hundredweight.....	1.00

\*The wheat used in 1912-13 contained five per cent barley and was valued at \$1.10 per hundredweight.

### EXPERIMENT OF 1910-11

This experiment was conducted to determine if it were profitable and practical to dispose of alfalfa hay by feeding it to lambs and to test out a combination of corn and native grains for feeding lambs for market.

The lambs were all wethers, consisting of 139 head of Lincoln-Merinos and 161 head of Shropshire-Merinos, purchased of Montie B. Gwinn of Boise. The 300 lambs cost \$3.25 per head, and averaged 65.7 pounds, October 26th, before the division. On November 1st they

were divided into two bands, the Lincoln-Merino type in one, the Shropshire-Merino type in the other, and were placed on feed in bedded yards as already described under Methods and Equipment. The smaller band averaged 68.0 pounds and the larger band 69.4 pounds. Both lots were fed the same rations; alfalfa hay, as much as they cared to eat, and a grain ration made up of 50 per cent barley, 25 per cent corn and 25 per cent wheat.

The lambs were fed one-eighth of a pound of the grain mixture per head daily for the first four days. The following eight days the allowance was one-fourth of a pound per head daily. At the end of eight weeks full feed, or an allowance of 2 pounds per head daily, was given. Lambs from the range know nothing of grains and if not brought gradually to a heavy ration serious losses will result. The grain was fed twice per day. The lambs started by eating three to three and one-half pounds of hay per head daily. When on heavy grain ration they ate one and three-fourths to two and one-fourth pounds daily per head. The grains were fed whole. Lambs masticate their feed thoroughly and it is a needless expense to crush or grind grains for them. This experiment was in charge of L. C. Aicher, the Superintendent of the Caldwell Experiment Farm.

Table I, which follows, shows weights by week periods, gains per lot and gains per head for the same period. It will be noted that the gains are quite regular with the exception of the weighing of December 20th, when losses of 320 pounds for Lot I and 165 pounds for Lot II are recorded. This weighing came after several days of rain during which it was almost impossible to keep the yards bedded dry and to keep the hay dry and palatable enough so that the lambs would eat it well.

The season for feeding at Caldwell in 1910-11 was very unfavorable, due to a great deal of rain which kept the yards soft and muddy. Three lambs were lost by death during the experiment.

Table II summarizes data concerning feeds and gains and cost of same. The average daily gains for Lot I and Lot II of respectively 0.31 and 0.33 pounds per head are very satisfactory and all that can be expected under average conditions. Lot II, containing the Shropshire blood, gained one pound more per head, and made each 100 pounds of gain at a cost of three cents less for feed. The combination of barley, corn and wheat produced satisfactory gains and a splendid finish. The comparatively high price of corn increased materially the feed cost.

After a feeding period of 84 days the lambs were sold as per agreement to the Union Meat Company of Portland, Oregon. This company is a progressive concern interested in building up the live stock breeding and feeding industry in the northwest and had furnished the money to buy the lambs without interest charges, provided that it might have the refusal of the lambs.

The lambs were shipped on January 24th, filling but three decks of two freight cars. The transportation charges were for two full carloads at the rate of \$107.00 per car. This saddled the feeding experiment with \$53.50 not necessary, could more lambs have been fed or could one deck have been disposed of locally to advantage. The lambs arrived at Umatilla on the evening of January 26th, and for reasons as yet unsatisfactorily explained by the railroad officials, were not released until 11:00 A. M., January 28th. This long delay required the feeding of 3,060 pounds of hay, at a cost of \$38.25, two-thirds of which could have been saved, and \$3.00 extra on the expenses of the man in charge. The total charges for freight, feed and yardage, Caldwell to Portland, a distance of 477 miles, were \$300.45, unquestionably excessive.

By eliminating unusual charges shown above, the lambs showed a small profit, in spite of the fact that they were sold at a time when the market was too low to offer much hope for successful grain feeding. The experienced feeder likes to have a "spread" or increase of at least one and one-half cents net between his buying and selling price to pay for feed and for his profit. Could the lambs have been sold on this basis, they would have netted \$1.13 per head, or selling the hay through the lambs, it would have brought \$15.00 per ton.

The above facts are given in detail because this bulletin is planned to furnish the prospective feeder practical information and to present the difficulties as well as the more favorable aspects of the lamb feeding business. The tables for the 1910-11 experiments follow:

**TABLE I.**

WEIGHTS AND GAINS OF LAMB FEEDING, 1910-1911.

Weighing Periods.	Lot I, Long Woolled Lambs.				Lot II, Middle Woolled Lambs.			
	No. Lambs	Weight lbs.	Gain lbs.	Gain Per Head, lbs.	No. Lambs	Weight lbs.	Gain lbs.	Gain Per Head, lbs.
*October 26	300	19710						
November 1	139	9450			161	11165		
November 8	139	9612	162	1.16	161	11435	270	1.68
November 15	139	9920	308	2.23	161	11857	422	2.62
November 22	139	10115	195	1.40	161	12085	228	1.42
November 29	139	10990	875	6.29	161	13100	1015	6.30
December 6	139	11095	105	0.76	161	13140	40	0.25
December 13	139	11945	850	6.12	161	13810	670	4.16
December 20	139	11625	-320	-2.30	161	13645	-165	-1.02
December 27	139	11800	175	1.26	160	13770	125	0.78
January 3	139	11882	82	0.59	160	13902	132	0.83
January 10	139	12290	408	2.94	160	14515	613	3.83
January 17	139	12810	520	3.74	160	14720	205	1.28
January 24	139	13125	315	2.27	159	15390	670	4.21

\*Before dividing into two lots.

TABLE II.

SUMMARIZED RESULTS OF LAMB FEEDING, 1910-1911.

Information Column	Lot I—139 Lincoln-Merino lambs fed barley two parts, wheat one part, and corn one part.	Lot II—161 Shropshire-Merino lambs fed barley two parts, wheat one part, and corn one part.
	Weights in pounds	Weights in pounds
Total weight, beginning.....	9450	11165
Average weight, beginning....	68.0	69.4
Total final weight.....	13125	15390
Average final weight.....	94.4	96.8
Total gain.....	3675	4225
Average gain per lamb.....	26.4	27.4
Days fed.....	84	84
Average daily gain per lamb	0.31	0.33
Barley fed.....	6586	7648
Wheat fed.....	3293	3824
Corn fed.....	3293	3824
Alfalfa hay fed.....	31730	35260
Grain for 100 lbs. gain.....	358	362
Hay for 100 lbs. gain.....	863	834
Cost of grain.....	\$151.42	\$175.91
Cost of hay.....	79.32	88.15
Total cost of feeds.....	230.74	264.06
Cost of feed for 100 lbs. gain	6.28	6.25

FINANCIAL STATEMENT, 1910-11 LAMB FEEDING

Cash Received:

	Lot I.	Lot II.
117 Lambs (tops), net weight 10780 pounds @ $6\frac{1}{2}c$	\$700.70	
138 Lambs (tops), net weight 12570 pounds @ $6\frac{1}{2}c$		\$817.05
22 Lambs (cut outs), net weight 1790 pounds @ $5\frac{3}{4}c$	102.93	
20 Lambs (cut outs), net weight 1600 pounds @ $5\frac{3}{4}c$		92.00
Total .....	\$803.63	\$909.05
Expenditures:		
Cost of Lambs.....	\$451.75	\$523.25
Cost of grain fed.....	151.46	175.91
Cost of hay fed.....	79.32	88.15
Freight .....	100.15	113.85
Feed, Umatilla.....	17.90	20.35
Feed, Portland .....	16.08	18.27
Yardage, Portland.....	6.95	7.90
Expense Bill, man in charge.....	4.15	4.75
Total .....	\$827.76	\$952.43
Total loss.....	\$ 24.13	\$ 43.38
Loss per head.....	\$ 0.17	\$ 0.28

By shipping both decks full there would have resulted a saving of \$53.50. The excessive delay at Umatilla necessitated three feeds of hay, otherwise unnecessary, totaling 2015 pounds and costing \$25.20 also adding \$3.00 to the expenses of the man in charge. The total of these unusual items is \$81.70. Could they have been eliminated the net profit would have been \$14.19 on 297 head, or approximately five cents per head.

### SHRINKAGE

	Lot I.	Lot II.
Average weight per head, Caldwell.....	94.4 Lbs.	96.8 Lbs.
Average weight per head, North Portland.....	90.4 Lbs.	89.7 Lbs.
	<hr/>	<hr/>
Loss .....	4.0 Lbs.	7.1 Lbs.
Shrinkage, per cent.....	4.2	7.3

### EXPERIMENT OF 1912-13

The 1912-13 experiment was planned with three objects in view: First, to demonstrate the possibility of a desirable market for alfalfa hay by feeding it to lambs; second, to determine the possibility of finishing lambs on native grains without corn; third, to test the relative feeding value of wheat and barley in lamb feeding.

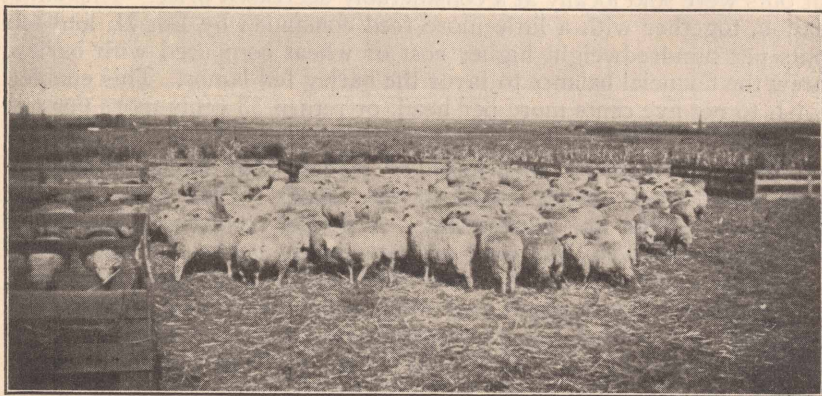
The lambs consisting of 513 head, were purchased of Scott Anderson of Boise, and were weighed up on his ranch north of Boise, October 15th, costing five cents per pound with an allowance of five per cent for shrink. They were driven overland to the Station Farm at Caldwell, arriving late October 16th. After a small feed of hay they were turned on grain and alfalfa stubble and mixed pasture of late seeding. No yards were available for enclosing the band at night until October 29th, and as a result three head were killed by coyotes. One lamb weighing 65 pounds died of pneumonia October 29th. This left 509.

The yards were bedded six inches deep with straw from the Station Farm October 29th, and the lambs sorted, divided and weighed. They were found to be a mixed lot cut back from tops sent to eastern markets. In the band were found 25 head of close fleeced, blocky lambs showing a preponderance of Merino blood; 294 big framed, long woolled lambs of both Lincoln and Cotswold crosses; and 190 Shropshire grades. Of the number showing a preponderance of Merino blood, one was found to be two years old and two were yearlings. The fleeces were still damp on the 29th from rains of the 27th and 28th, and second weights were taken October 30th, which are used as initial in the tables. Lot I. consisted of 254 lambs averaging 72.9 pounds per head; Lot II. consisted of 255 lambs averaging 72.2 pounds per



head. Losses early in the feeding period reduced Lot I. to 251 and Lot II. to 254 lambs.

Both lots were fed as much as they would eat with a reasonable waste of bright, clean alfalfa hay. The average amount eaten daily per head was 2.4 pounds. First cutting purchased of R. Judd, in addition to that grown on the Station Farm, was fed October 30th to January 9th, after which third cutting from the Station was fed either alone or in combination with first cutting. Accurate records were kept of hay given to each lot.



Lot II. at the beginning of the experiment, showing the type of lambs fed in 1912-13.

The grain rations were as follows: Lot I., three parts barley and one part oats; Lot II., three parts wheat and one part oats. The barley and oats were of good quality bought in the surrounding country. The wheat was grown on the Station Farm, and was of excellent quality, but contained five per cent barley. The lambs in each lot were started on one-eighth of a pound per head daily, and were gradually led to the full ration of one and one-half pounds.

The lambs started gaining slowly for the reason that they were not a uniform or very thrifty bunch, they had too much room and were infested with ticks. The average daily gains per lamb were for Lots I. and II. respectively 0.26 and 0.28, or 0.05 pounds in each case under the averages of 1910-11. The wheat fed lot made 2.8 pounds per head more gain during the experiment, required 17 pounds less grain and 53 pounds less hay for 100 pounds of gain and notwithstanding a charge of ten cents per hundred for wheat over barley, made each 100 pounds of gain at a lessened cost of six cents as compared with the

barley fed lot. Contrary to the prediction of some sheepmen no difficulty was found in getting the sheep to take the full feed of wheat and no more lambs were "off" feed or had digestive trouble than in the barley fed lot.

In the financial statement for this experiment, the wheat fed lambs are found to return a gross of only \$22.39 more and to net \$9.13 less than the barley lot. The explanation for this slight advantage on gross returns is found in the selections of the buyer of the Carstens Packing Company. In his elimination of 23 inferior lambs, eight were taken from the barley fed lot and fifteen from the wheat lot. These cut outs were sold locally at a considerably decreased price. This elimination, together with a little more feed consumed by Lot II. and ten cents per hundredweight higher cost of wheat compared with barley, threw the financial balance to favor the barley fed lambs. This enabled Lot I. to net five cents more per head, or return 33 cents more per ton for hay.

It is the common experience of feeders that lambs refuse the coarser and more woody stems of the alfalfa. This waste is most marked in feeding first cutting hay. A careful record was kept of all spoiled hay and stems that were not eaten by the lambs. This amounted to 5.3 tons with Lot I. and 6.6 tons with Lot II. The wheat fed lambs, though making more rapid and more economical gains, were more fastidious and wasteful in their eating of hay. The total hay consumption was 73.54 tons. Of this 11.9 tons, or 16 per cent, was waste. The hay actually eaten by the lambs was 61.64 tons. Could the lambs have been induced to eat this amount up clean and it been made to produce the same results, as were produced by offering the larger amount, by cutting or chopping, 11.9 tons valued at \$59.50 would have been saved. The cutting, however, at \$1. per ton, the price commonly charged for the same, would have cost \$61.64. Grinding would have been much more expensive. The conclusion is obvious, that with alfalfa hay having a farm value of from \$3.50 to \$6.00 per ton cutting or grinding is inadvisable and unprofitable.

Four lambs were lost before grain feeding began, as already indicated. Two that had evidently come from the range with enlarged jaws, died soon after starting the experiment. A small lamb died from Lot I. and two medium sized lambs from Lot II. One of the two latter died from pneumonia and the other with diarrhea. The last mentioned is the only loss that might be ascribed to wheat feeding. Just before shipping another lamb was lost from Lot II. These losses account for the decrease of number of lambs in each lot as the feeding period advanced.

The lambs were sold to the Carstens Packing Co. of Tacoma at 7 1-2c per pound weighed up at Tacoma after cutting back 23 head as indicated before. The lambs were large and vigorous, averaging 106

pounds when driven from the Station Farm March 3d. They were loaded in two double decked cars spotted for the purpose and freshly sanded. Soon after the sheep were loaded evidence was found that the cars had not been properly cleaned before sanding. The lambs kicked the sand to the edge of the cars uncovering a deep ridge of ice mixed with some manure. The warmth of the sheep melted the ice and those that laid down had wet heavy fleeces and after being trampled upon lost strength rapidly. Due to this and combined with unusually warm weather for the time of the year in the valleys of Eastern Oregon 10 lambs valued at \$66.20 were lost in transit. The run to Tacoma was made in good time.

In the financial statement the lambs are found to have made a reasonable profit above expenses. In this list of expenses are found \$90. for labor and \$77. for gasoline. The extra labor came from combining the labor of the Caldwell Farm with the feeding experiment. The gasoline charge came from the fact that the only engine available for pumping water was several times the necessary horse power. On the farm the manure is worth the labor involved and the farm water supply is ordinarily sufficient to supply a considerable band of lambs. By eliminating these items the alfalfa hay was sold through the lambs for \$11.17 per ton in Lot I, and \$10.84 per ton in Lot II. Under favorable conditions the losses from coyotes and in shipping might have been avoided, giving the hay an added value in each Lot of approximately \$1. per ton.

The lambs were kept too long and when sold were too large to suit market conditions. Thomas Carstens of the Carstens Packing Co. wrote as follows: "While the quality of these lambs is first class, still the butchers will kick on account of their size—everybody seems to be in love with 35 to 40 pound lambs (when dressed). In fact the smaller the better they like them, as long as they are fat." The Carstens Co. buyer pronounced the finish from small grain to be of high quality, making no distinction between the wheat fed and the barley fed results.

The question is frequently asked as to whether it will pay to buy corn. The feeding of 1912-13 was successful without the use of a pound of corn.

The lambs were fed by Chas. Hampson, superintendent of the Caldwell Station Farm. Mr. Hampson had fed cattle, but had no previous experience with sheep.

## WEIGHTS AND GAINS OF LAMB FEEDING, 1912-1913.

## WEIGHTS AND GAINS, LAMB FEEDING, 1912-1913

Weighing Periods.	Lot I.				Lot II.				
	No. Lambs	Weight lbs.	Gain lbs.	Gain Per Head, lbs.	No. Lambs	Weight lbs.	Gain lbs.	Gain Per Head, lbs.	
*October	15	513	34235						
October	30	251	18360		254	18365			
November	8	251	19515	1155	4.60	254	19440	1075	4.23
November	16	251	19365	-150	0.59	254	19470	30	0.12
November	23	251	19365	00	0.00	254	19475	5	0.02
November	30	251	19767	402	1.60	254	19800	325	1.28
December	7	251	20136	369	1.47	254	20240	440	1.73
December	14	251	20665	529	2.17	254	20740	500	1.97
December	21	251	20920	255	1.02	254	21130	390	1.54
December	27	251	21565	645	2.57	254	21895	765	3.01
January	6	251	21565	00	0.00	254	21950	55	0.22
January	14	251	22460	895	3.56	254	22840	890	3.50
January	23	251	23120	660	2.63	253	23565	725	2.85
January	30	251	23515	395	1.57	253	24200	635	2.50
February	8	251	24670	1155	4.60	253	25130	930	3.66
February	15	251	24815	145	0.58	253	25405	275	1.08
February	22	251	25885	1070	4.26	253	26380	975	3.84
March	1	251	26250	365	1.45	252	26850	470	1.85

\*Weighed up at the Scott Anderson Ranch 20 miles from Boise, Idaho, with 5 per cent allowance for shrink deducted.

**TABLE IV.**

SUMMARIZED RESULTS OF LAMB FEEDING, 1912-1913.

Information Column	Lot I—251 lambs fed barley three parts, oats one part.	Lot II—254 lambs fed wheat three parts, oats one part.
	Weights in pounds	Weights in pounds
Total weight, beginning.....	18360	18365
Average weight, beginning....	73.2	72.3
Total final weight.....	26250	26850
Average final weight.....	104.6	106.5
Total gains.....	7890	8485
Average gain per lamb.....	31.4	34.2
Days fed.....	122	122
Average daily gain per lamb	0.26	0.28
Barley fed.....	23388	
Wheat fed.....		23708
Oats fed.....	7828	7953
Alfalfa hay fed.....	73095	74090
Grain for 100 lbs. gain.....	396	379
Hay for 100 lbs. gain.....	926	873
Cost of grain.....	\$312.16	\$340.32
Cost of hay.....	182.74	185.23
Total cost of feed.....	494.90	525.55
Cost of feed for 100 lbs. gain	6.27	6.19

**FINANCIAL STATEMENT—EXPERIMENT 1912-1913**

Cash Receipts:

	Lot I.	Lot II.
238 Lambs, net weight 22645 pounds, @ 7½c.....	\$1698.37	
232 Lambs, net weight 22515 pounds, @ 7½c.....		\$1688.63
6 Lambs, net weight 559.5 pounds, @ 5½c.....	30.77	
11 Lambs, net weight 1025 pounds, @ 5½c.....		56.40
2 Lambs, net weight 130 pounds, @ 5c.....	6.50	
4 Lambs, net weight 260 pounds, @ 5c.....		13.00
Total .....	\$1735.64	\$1758.03

Expenditures :		
Cost, Lambs.....	\$ 855.06	\$ 856.69
Cost, driving overland.....	6.10	6.10
Labor .....	45.00	45.00
Gasoline for pumping.....	38.50	38.50
Cost, grain fed October 30-March 1.....	312.16	312.16
Cost, hay fed October 30-March 1.....	182.74	185.23
Cost, additional grain.....	6.50	6.45
Cost, additional hay.....	5.50	5.50
Cost, feed at LaGrande.....	2.90	2.90
Cost, feed at North Portland.....	15.85	15.84
Cost, feed at Tacoma.....	2.90	2.90
Expense Bill, man in charge.....	3.00	3.00
Freight .....	117.35	116.65
<b>Total .....</b>	<b>\$1593.56</b>	<b>\$1625.08</b>
<b>Net Profit .....</b>	<b>\$ 142.08</b>	<b>\$ 132.95</b>
Net Profit per lamb.....	0.57	0.52
Price received per ton for hay.....	8.89	8.56
Profit per lamb, excluding labor and gasoline charges.....	0.90	0.85
Price received per ton for hay, excluding labor and gasoline charges.....	11.17	10.84

#### SHRINKAGE

Shrinkage, Caldwell Station Farm to Tacoma, Washington, counting dead lambs.....	11.2 per cent
Shrinkage on live lambs, Caldwell Station Farm to Tacoma, Washington .....	9.6 per cent

#### CONCLUSIONS

The following are prominent among the conclusions that may be drawn from the two experiments :

1. Idaho lambs, even of the "cut back" type, can in favorable years be used as a means of profitably marketing alfalfa hay, giving it a farm value of from \$9. to \$15. per ton.
2. The small grains of Idaho can be profitably fed to lambs, producing a well fattened lamb.
3. Methods of handling and market conditions are a big factor in determining the measure of success in lamb feeding.
4. Cutting or grinding of hay for lambs is not warranted by prevailing prices for alfalfa in most sections of the state.
5. Wheat combined with some oats is a safe feed for lambs and produces more rapid gains and requires less pounds for a given amount of gain as compared with barley.

6. Lambs should be marketed if possible when comparatively light: Above 95 lbs. is objectionable.

7. Experiment I. indicates that a somewhat more rapid and a little cheaper gains can be obtained from a preponderance of Shropshire as compared with Lincoln blood.

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## SELECTION OF THE FARM FLOCK

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### GRADES FOR FOUNDATION

Those who expect to follow Sheep Husbandry successfully must have as much special knowledge and training as for any other business. Sheep differ decidedly in habits and temperament from all other animals, and skill acquired with horses, cattle or hogs is not of much value as applied to sheep. The first problem in successful Sheep Husbandry is the selection of the flock.

A great many farmers now have the laudable ambition to handle pure-bred animals. If a beginner or having but limited experience with sheep, it is wisest to select grade ewes for a foundation. A bunch of good grade ewes can ordinarily be bought from the range very reasonably. The use of a good ram, of one of the breeds that combines a good fleece with a well developed mutton form, rapidly improves and makes the flock uniform and entirely creditable for farm use. There is a field also for the pure-bred farm flock. As the advantages of sheep on the farm are more thoroughly understood and more widely appreciated there will be calls for both pure-bred ewes and rams, at such prices as will yield the producer a substantial profit. Success with a pure-bred flock requires considerable outlay for foundation stock, some knowledge of the principles of animal breeding and some skill in advertising and disposing of surplus animals.

Inferior ewes, such as can be obtained very cheaply and are weeded out because of spoiled bags, broken mouths or infertility, should not be chosen for any part of a breeding flock at any price. These should pass along to the butcher. Unless ewe lambs are dropped in late winter or very early spring and have made good growth they should not be bred until yearlings. Ewes are at their best as producers at from three to five years old. Many retain their breeding powers and their teeth until eight to ten years of age. Some lose or break their teeth, preventing proper mastication of food, at five or six years of age and should be discarded from the flock. Five points to be especially sought for in choosing ewes are, deep bodies, wide, level and straight backs, strong legs, fine fleeces covering the body evenly and thoroughly and feminine heads.

## PURE-BRED RAMS

The ram should always be a pure-bred. Neither the range flock-master nor the farmer can make any progress in flock improvement, or even keep the flock up to its normal, when using scrub or grade rams. In addition to being purely bred the ram should be an excellent individual. The measure of profit in selling lambs is determined by their size for age, conformation and condition. Starting with grade ewes, improvement in size, conformation and early maturity and more desirable feeders may be secured most cheaply by using a good ram on the ewes already at hand if they are vigorous and good milkers.

The desirable ram should be long, deep, thick, lowset, with a straight, strong back, and should be well developed in all the details of mutton conformation. In addition, he should have style, vigor, masculine bearing, and should conform as closely as possible to the standards set for his breed. Since ewe lambs are generally retained to supply losses, and being important to the flock, considerable emphasis must be laid on the ram's fleece. Mutton should be the more important side to sheep raising on the farm, but wool must not be neglected. The farm flock should shear seven to ten pounds per head.

## MERINO TYPES

Sheep are naturally divided into two main classes or divisions, one of them especially adapted for wool and the other best suited for mutton production. The Merino breeds and strains comprise the wool division in which mutton is a minor consideration. These sheep are rather long legged, lack in depth of body, are flat in the rib, sharp of the shoulder and narrow in the back, have comparatively long necks and coarse heads and lack in loin, leg of mutton, and in general fall materially short of the ideals of mutton conformation. These sheep, however, excel in wool, bearing fleeces two and one-half to four inches long, very dense and compact, very fine of fiber, kept moist and made much heavier by a yolk or grease exuded by the skin of the sheep. This kind of wool is the finest and for most purposes the best that comes from any type or breed. The Merino strains are hardy, flock well together on the range, make wonderfully good use of scanty feed and as a rule are good mothers. The common breeds are Spanish Merino, American Merino, Delaine Merino and Rambouillet. As pure-breds, the Rambouillets only are of much importance in Idaho.

## THE RAMBOUILLET

The Rambouillets, frequently designated as French Merino, are of Spanish Merino descent, the original flock having been taken from Spain to France in 1783. They get their name from the Royal Farm at Rambouillet near Paris. Since the establishment of the flock at Rambouillet, this sheep has been bred for size and mutton form, at the same time insisting on length and fineness of fiber and weight of fleece. In



Idaho the grade ewes, and in many cases, pure-breds not registered, are handled on the range, and are popular for this purpose because of grazing and flocking qualities of the Merino origin. Pure-bred rams are used for crossing on grade ewes that have acquired too high a percentage of the blood of mutton breeds to best meet the requirements of the flockmaster. Some farmers find pure-bred Rambouillet flocks profitable, selling the male offspring for use on the range.



Rambouillet ram sold during the Butterfield Live Stock Co. Sale, Weiser, Idaho, September, 1912 for \$1000. Courtesy Shepherd's Journal

The popular type of Rambouillet today is smooth bodied with the exception of a few folds on the neck, and better developed in mutton qualities than any of the other Merino types. The frame is large, bone heavy, body quite deep, well developed in back, loin and leg of mutton. The legs are rather long and the mutton form is hardly to be compared with the special mutton breeds. The average weight for rams is 185 to 200 pounds, with more growthy ones sometimes making 100 pounds more. Ewes average 150 to 160 pounds. The ewes are polled

and practically all rams have large horns with spiral curves. The wool is of medium length and fineness sacrificed in many cases to secure size and smoothness of body. The rams shear 16 to 20 pounds, and the ewes 10 to 14 pounds.

Rambouillet ewes are prolific and good mothers. Some authors recommend this breed for fall and early winter lambs. This statement is confirmed by experience with ewes of the breed in the University of Idaho flock. The Rambouillet ewes were with the rams for a short time in early May, 1912, and four ewes dropped six lambs in October. Lambs that are dropped in the fall, if made to grow rapidly and fattened, sell for "hot house" or "Christmas" lambs. These lambs return a big profit if one is located near a city where a satisfactory market for the same can be secured.



Southdown ewe owned by the University of Idaho, champion ewe of the breed at the Oregon and Washington State Fairs and the Spokane Interstate Fair, 1912.

#### MUTTON BREEDS

The mutton types are almost entirely of British origin and are divided into "medium wool" or "down breeds" and "long wool breeds." The low hills which are a common feature of the landscape in Sussex,

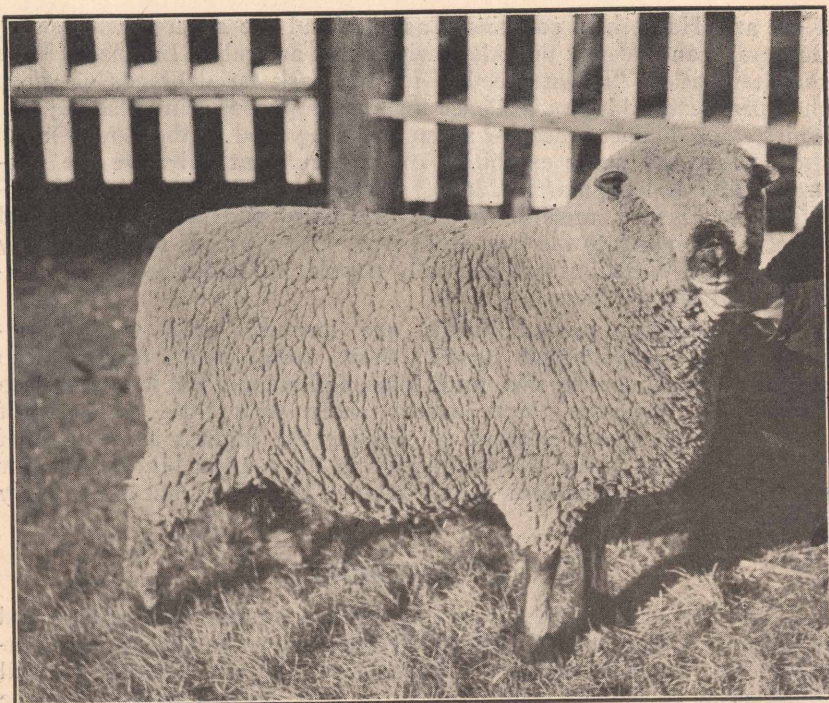
Kent and Hampshire counties, England, and are covered with short, fine grass, and largely underlaid with chalk are called Downs. Hence the designation, "Down breeds," for the dark faced breeds of sheep that have reached high excellence for mutton purposes in those regions. Thirty-nine distinct breeds of sheep are recognized by the Royal Show, the leading live stock exhibition of England, but only five are generally bred and popular in Idaho. These are the Shropshire, Hampshire and Oxford, medium woolled or Downs and the Cotswold and Lincoln belonging to the long wool type. Other breeds found in many parts of the West, but not generally popular in Idaho are the Southdown and Dorset Horn.

The medium woolled breeds are low-set, deep, thick, compact sheep, with broad heads, short faces, short necks, deep shoulders, wide sprung ribs, thick loins, full rumps, full legs and deep twists. The vigorous thick meated sheep with little evidence of roughness and waste, adapted to yielding the highest percentage of high priced cuts is the one sought for in the mutton breeds both for the market and for the show ring. Wool is important, but a secondary consideration to meat.

### THE SHROPSHIRE

The Shropshire comes from the Midland counties of England, and is descended from an old very hardy type known as the Morfe Common. The breed is widely distributed over the world and does well under such variety of conditions as to have been designated as the "cosmopolitan breed." Next to the Southdown the Shropshire nearest meets the ideals of the mutton type. Sheep of this breed are medium in size, the rams averaging 225 and the ewes 150 to 160 lbs. The body is generally and should be long and deep and squarely set on short legs. The head is wide, the ears small, and the face refined in the ewes. The neck is short, blending smoothly into the shoulders. The back and loins are wide and well covered and the leg of mutton thick and plump. Well-bred specimens are woolled to the toes and tip of the nose, and the fleece is compact and of considerable length averaging the best combination of quality and quantity of any of the strictly mutton breeds. Rams shear 12 to 15 pounds and the ewes 8 to 12 pounds. The face and legs are brown and the fleece clear white. Well covered faces and legs are preferred, because they are usually associated with heavy fleeces of fine texture.

The Shropshire has a wide reputation as a farmer's sheep. This is due to the excellent combination of mutton form, fleece and prolificacy, the ewes averaging at least one and one-half lambs, and to early maturity. Gains are not so great as with some breeds, but both frame and flesh grow together bringing the lambs to marketable size and condition at an early age. The farmer can hardly go wrong in selecting Shropshire sheep.



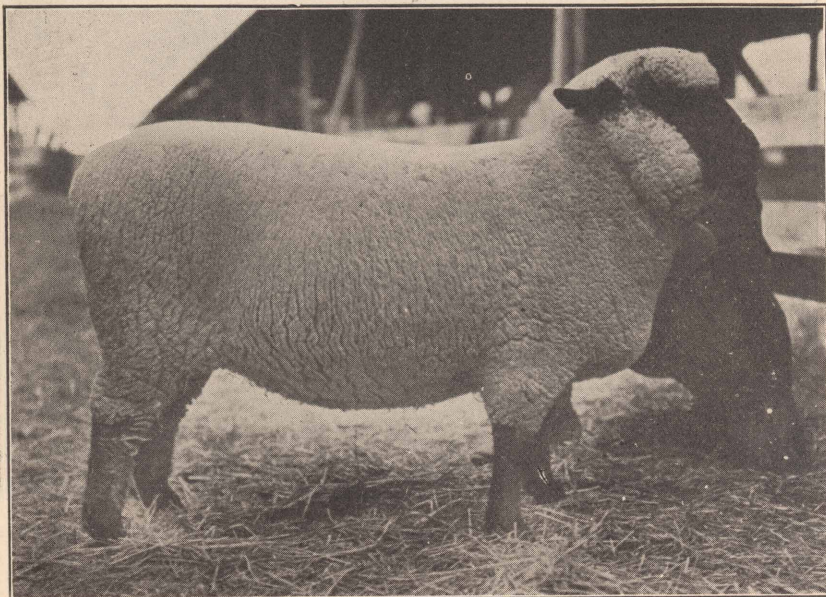
Yearling Shropshire Ram bred by Knollin and Finch, Soda Springs, Ida.  
This ram was first prize for his age and breed at the Utah State Fair,  
1912.

### THE HAMPSHIRE

The Hampshire is another breed adapted principally for mutton production. The sheep of this breed are descended from an old type of the same name that existed in Hampshire, England, and have been improved by the infusion of Southdown blood and by feeding and selection. The Hampshire is larger than the Shropshire by 25 to 50 pounds, is more rugged of frame and is a little more upstanding and less compact. The face is quite bare of wool. The ears and face are a characteristic blackish brown. The face is longer than that of the Shropshire. The nose inclines to be Roman and the ears are heavy, carried to the side and facing forward. The necks are a trifle longer than the ideal mutton standard would dictate and the shoulder blades average high and prominent. The body is deep, the back strong and broad, the rump long and the leg well developed. The bone is heavy, the entire sheep rugged and vigorous of build. The fleece is lacking

in length, density and quality as compared with the Shropshire. The average ewe shears 6 to 9 pounds and the ram 9 to 12.

The Hampshire is now one of our most desirable farms breeds. It has popular size and in prolificacy compares well with the Shropshire. The ewes are good mothers excelling the Shropshire. The lambs make



Hampshire ewe, Overbrook Honey Girl, owned by Overbrook Farms, Jerome, Ida. This ewe was champion of her breed at the Intermountain Fair, Boise, Idaho, 1911.

more rapid gains than some of the smaller breeds, and either as pure-breds or grades make the most desirable kind of feeder lambs. For the last two years in Idaho Hampshire rams have been selling more readily than those of any other breed.

### THE OXFORD

The Oxford Down sheep comes from Oxford county in central England and is the result of a Hampshire-Cotswold cross. In some characteristics the Oxford, as might be inferred from its ancestry, resembles the Hampshire. The Oxford, however, is larger, averaging for the rams 275 pounds and 200 pounds for the ewes, is more rangy and bigger framed in every way, the face a lighter brown, the nose with

less tendency to Roman and ears smaller and more erect as compared with the Hampshire. The fleece is the longest of the down breeds, covers the body well with a characteristic foretop on the poll of the head. Many of the fleeces are rather coarse and open.



Oxford type as shown by prize winning animals at the International Live Stock Show, Chicago.

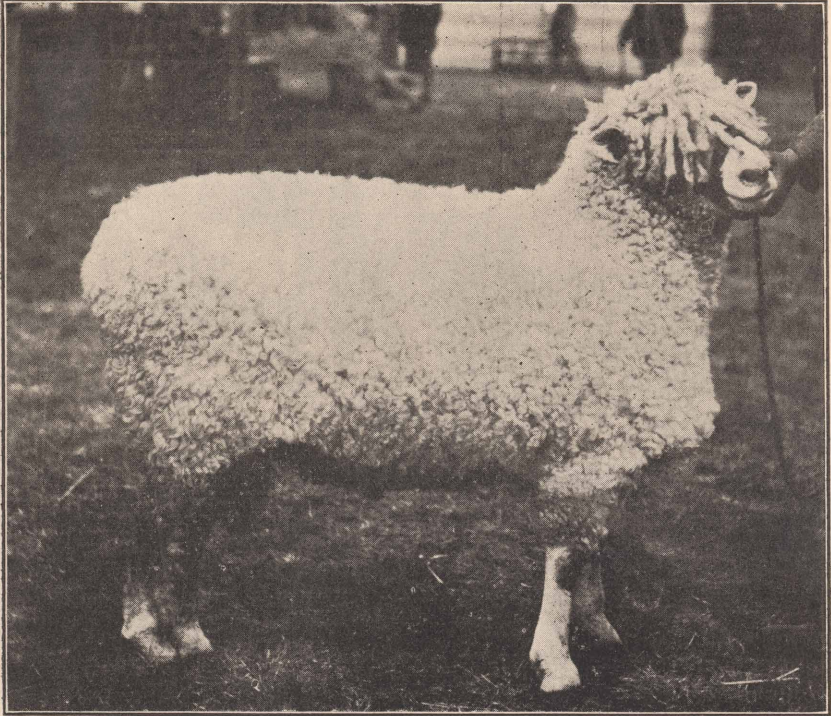
The Oxford has size over the breeds just described, ranks with them in prolificacy and stands a little above the Shropshire in average weight of fleece. The lambs are good feeders, but hardly rank with Hampshire lambs in growthiness and with the Shropshire in early maturity. The breed makes an excellent sheep for the farm but is not as popular in Idaho as the other five mentioned.

### THE LONG WOOLS

The long wool breeds bring size and length and weight of fleece to the farm flock. They are somewhat more leggy and rangy and are larger framed than the down breeds. On account of their size and conformation they are a little later in maturing. The matured animals tend to lay on external fat, and on account of this tendency, the carcass is not so highly regarded by meat specialists. The wool grades as coarse combing and is long, strong and rather coarse in fiber. In most of the longer wooled breeds the wool hangs in flakes or strands.

## THE COTSWOLD

The Cotswold is one of the most popular breeds of the above described type and one of our oldest breeds of sheep, thought to have existed in England at the time of the Roman conquest. It was so named from "cots" or small houses used to shelter the sheep and "wold" or rolling upland pasture. The improving blood was Leicester.



A noted Cotswold Ram, a first prize winner at the Royal Show of England.

The modern Cotswold is a massive sheep of impressive bearing. The body is long and deep and the back broad and level. The head is carried stylishly and notwithstanding the size of the sheep the body is smoothly turned. The face is white or gray and the legs of the same color. The wool is long, finer than that carried by most breeds of this type and covers the body well. A marked characteristic is a foretop of spirals, which in well-bred specimens hangs almost to the tip of the nose.

This breed ranks high among long wool breeds in grazing, but

individuals in it are sometimes found none too vigorous. They stand especially high as milkers and are consequently good mothers. Some of the Idaho sheepmen claim that Cotswolds are the best mothers of all the breeds. On account of these qualities Cotswold blood is especially desired in the ewes. In prolificacy the breed is average. Good flocks should shear an average of 12 to 14 pounds per head.

### THE LINCOLN

The Lincoln is considered by many authorities to be our largest



The world's most noted breeder of Lincoln sheep, the late Sir Henry Dudding of England, holding one of his first prize Lincoln rams.

breed of sheep. It came from the north of England and but little is known of its early history. Improvement was brought about by selec-



tion and the use of Leicester blood. The breed is even larger and more rugged of frame than the Cotswold. The head is somewhat coarser, the back broader and the bone heavier than that of the Cotswold. Likewise the fleece is longer, not infrequently reaching 15 to 18 inches in length, and the fiber is coarser. The rams occasionally weigh 400 pounds and the ewes 300. The extreme weights are often accompanied by coarseness. The average is 300 pounds for mature rams and 250 to 275 for mature ewes. Ram fleeces run 16 to 22 pounds and the ewes fleeces 12 to 15. This breed lacks the spirals hanging from the forehead, but has a tuft in their place.

Lincolns bring weight and substance and ruggedness to a flock, and are especially well adapted to the farm where plenty of feed is available. They were developed as a breed on some of the richest and best farming land in England. They also bring increased weight of fleece and length of staple. The annual increase from average ewes is 125 per cent to 135 per cent.

Both Cotswolds and Lincolns are later in maturing than the downs. Both, however, are very popular with Idaho sheepmen and have been of great value in giving size, substance and length and weight of fleece to range flocks. Both breeds do well on the farm, the Lincoln excelling in size and weight and length of fleece and Cotswolds standing first as mothers and in quality of fleece.

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## FLOCK MANAGEMENT

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### IN SUMMER

Mid or late summer is a good time to look out for ewes for starting a flock. Sheepmen at this time begin to plan for the fall and winter and decide what portion of the flock they can let go. Unthrifty ewes have as a rule not recovered from the effects of the previous winter and barren ewes can at this time be distinguished from those that have borne and are suckling lambs.

The keep of the flock in summer is a light charge. They need pasture, enough of it to keep them in thrifty condition, and if suckling lambs, to keep them milking well. Pasture may be provided in waste places as suggested in the early pages of this bulletin. It may be a regular pasture of the common grasses or may be special sowed crops. Rye, peas and oats, rape and kale are examples of forages that can be sowed especially for sheep and made to yield through them excellent returns. Sheep make good use of rough feed and poor pastures. In this respect sheep may be easily abused. Some men's interpretation of "forcing the flock to rustle" is akin to starvation. When grass is available no other feed is needed or advisable, even when

ewes are suckling lambs. When pastures get short and dry in late summer or fall some of the sowed pastures above mentioned or root crops should be provided. The ram in summer should be separated from the ewes and fed similarly.

In the irrigated sections alfalfa has been found a dangerous pasture at times on account of causing losses from bloat. When alfalfa and clover are not irrigated they can be pastured safely with sheep if some care is exercised. Reasonable care means that the animals must not be turned into rank growing alfalfa or clover when extremely hungry, and it is safer to keep them off for a while after rains or heavy dews.

Sheep can do without water with less inconvenience than any of our common farm animals. They need it, however, and should have it at regular and frequent intervals in summer. Twice per day is sufficient. Clean and if possible fresh water pays. The flock, if allowed a choice, prefers to graze in early morning and late afternoon and evening, spending the heated periods of the day quietly in a shady place. Shade trees or shades permitting free air circulation suffice for this purpose. Some sort of protection from the sun is necessary, if the flock is to do well.

#### AUTUMN PROBLEMS

When cool weather comes in the fall, the ewes begin coming in heat. This is the time of all our common Idaho breeds. Dorset Horn ewes take the ram in spring and drop lambs in early fall. This is also true to a certain extent of some Merino families. In England and some parts of America "flushing" of the ewes is practiced to prepare them for mating with the best results. Many ewes are in thin flesh and low in vitality after their lambs have been weaned. Flushing is a system of good feeding to get the ewe in vigorous condition before conception. Rape or other rich pasture is used quite widely as a feed for this purpose, and is sufficient without grain. If grain is used a small feed of oats will be found to give satisfactory results.

Choice of time for breeding should depend on shelter and facilities for lambing, kinds of feed available in spring and market available or preferred for lambs. Lambing in February or March in most parts of Idaho requires shelter and adequate means of taking care of the lambs and protecting both ewes and lambs from storms. If the ewes suckle their lambs properly they must have grass or other stimulus to milk production within two weeks after lambing. In case of winter lambing grains and root crops must be made to take the place of grass. It is seen, therefore, that early lambing has its undesirable features. If ram lambs are to be sold for fall service they must come early to be big enough for service, and in some communities winter or early spring lambs that can be made to weigh 50 to 60 pounds in May find ready sale at good prices. The ewe's average period of gestation is

147 days. The rams should be first used then twenty-one weeks previous to when first lambs are wanted.

The ordinary method of breeding is to permit the ram to run with the ewes during the breeding season. This results in favoritism to particular ewes and in unnecessary service. A better system is to keep the ram separate and turn him with the flock for a short time at night and in the morning. As each ewe is served she may be removed from the flock. By this system a single ram may be made to successfully breed 80 to 100 ewes. Attention must still be paid to ewes served and separated. Some ewes pass through several periods of heat before conceiving. When the ram runs at large with the flock not more than 40 to 50 ewes should be allowed to each ram. During the breeding season a ram needs some grain in addition to pasture.

### WINTER CARE AND FEED

The first problem in winter feeding is to start the ewes into the winter period in good flesh and vigorous condition. If this is done hay and various other fodders are sufficient for the greater part of the time. In some sections where corn is one of the leading crops, corn fodder with the ears removed has given quite good results, without grain in addition. Clover, alfalfa or other legume hays are very palatable for sheep and are a sufficient feed for the greater portion of the period of pregnancy. Root crops, silage free from mold, both in moderate amounts, give splendid results along with clover or alfalfa hay. Heavy feeding of root crops previous to lambing, it is claimed by some sheepmen, results in flabby lambs of low vitality.

One of the problems of the flockmaster is to have his ewes give sufficient milk for the new lambs. Ewes fed the entire winter on dry feed, particularly true of young ewes, frequently have no milk after lambing and refuse to own their lambs. Older ewes take care of their lambs but have an insufficient milk flow. The Idaho Station was recently requested to suggest a ration for 5000 Merino ewes to overcome the trouble mentioned. It can be almost entirely overcome by light grain feeding beginning four to six weeks previous to lambing. Root crops or other succulent feed in addition are very desirable. Oats or bran and oats are to be preferred among the grains, and the daily allowance per head need not exceed one-half pound.

Tightly enclosed shelters for sheep in winter are neither necessary nor advisable. The sheds or barns need first of all to be kept dry underfoot and there should be sufficient room under shelter or in outside yards for exercise. If weather permits, a good plan is to compel the ewes to walk a reasonable distance to a field or another yard for their hay. For shed room some authorities recommend 15 square feet per sheep. The fleece keeps the body warm and the overhead protection needed is such as will keep off storms and prevent drafts.

In quite cold weather, if the nights are dry, sheep are found to prefer the open air to enclosed sheds.

Where the flock varies as to size, and some are much more timid than others, good results follow dividing them into uniform bunches. The rams must be kept separate and kept in no more than good condition. Legume hay and one-half pound of bran and oats daily per ram is ordinarily sufficient.

### LAMBING

Management at lambing time generally determines the measure of success with the flock for the year. The percentage saved is all-important and runs from 40 per cent to 150 per cent depending on feeding and management of the flock previous to lambing, time of year of lambing, equipment for taking care of the ewes and lambs and faithfulness of the work of the shepherd. In winter or early spring some shelter for night and conveniences for warming chilled and weakened lambs are required.

Some ewes, especially young ones, need to be placed by themselves for from two to four days until ewe and lamb learn to know and be able to find each other. Some lambs are born very weak and need to be rubbed to start the circulation and given warm milk and stimulants to give them a start in life. Saving of such lambs often does much to help the percentage. Orphans are common and must be placed on another ewe or raised by hand. Often by placing the skin of a dead lamb on an orphan, the mother of the former can be induced to take the latter. Other simple devices are made to serve the same end.

Many fail in raising orphans by hand. The principal reason is overfeeding. The best method of feeding is with a bottle and rubber nipple. The first two or three days the cows milk should be given every two hours, at first only two or three tablespoonfuls at a feed. Milk from a high testing cow is best. The bottle and nipple must be kept clean and sanitary and the milk warmed for each feeding to about 92 degrees Fahrenheit.

After lambing the ewes should have feed ample for making a strong milk flow. Some grain or grain and root crops for a few days and then grass is the common and entirely satisfactory method.

If the lambs are expected to make rapid growth they should be taught to eat grain early. After grazing is good the ewes need no grain. Feeding the lambs grain is solved by making them a creep. In a separate enclosure are placed low troughs for the lambs and entrance to this place is gained by openings that admit the lambs but not the ewes. Crushed oats and bran or crushed oats and corn meal are grain combinations suited for offering lambs in a creep.

### OTHER SUGGESTIONS

Docked lambs keep cleaner and as fat lambs bring a higher price on the market. Docking should be done at 7 to 14 days of age. The tail should be severed with a knife or docking pincers at a point about one and one-half inches from the body. The pincers are used hot to prevent bleeding and are favored by many shepherds of the central states.

No ram lambs except pure-bred intended for breeding should be permitted to escape castration. Ram lambs gain slowly and in addition annoy other lambs in the feedlot. A good time for this work is on a bright day when the lambs are 10 to 14 days of age. The lower third of the scrotum is cut off and the testicles pulled out. The use of one of the many common disinfectants in connection makes the operation safer.

The average weaning time is at four months of age. Good pasture for the lambs at this time enables them to grow fast and miss their mother's milk but little.

Dipping for ticks is advisable once or twice a year, and at any rate once soon after shearing. Ticks become troublesome when the fleeces are long and as soon as the wool is removed go onto the lambs. Dipping of the whole flock at this time as a rule means little trouble from ticks until the next spring. Scab has troubled in Idaho, but is now under control.