5-1-1911

Breeding and Feeding Sheep

J.W. Wilson

BULLETIN NO. 127. MAY, 1911.

AGRICULTURAL EXPERIMENT STATION

SOUTH DAKOTA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS

DEPARTMENT OF ANIMAL HUSBANDRY

BREEDING AND FEEDING

SHEEP

Six Breeds Six Years

BROOKINGS, SOUTH DAKOTA

From the Press of the
Mitchell Publishing Company
Mitchell, S. D.

GOVERNING BOARD

Hon. A. E. Hitchcock, President.....Mitchell, S. D.
Hon. P. W. Dwight, Vice President....Sioux Falls, S. D.
Hon. A. M. Anderson.....Sturgis, S. D.
Hon. August Frieburg.....Beresford, S. D.
Hon. H. Reinhardt.....Eureka, S. D.

STATION STAFF

A. E. Hitchcock.....Regent Member
P. W. Dwight.....Regent Member
Robert L. Slagle.....President of College
James W. Wilson....Director and Animal Husbandman
N. E. Hansen.....Vice Director and Horticulturist
James H. Shepard.....Chemist
E. W. Olive.....Botanist
E. L. Moore.....Veterinarian
C. Larsen.....Dairy Husbandman
Clifford Willis.....Agronomist and Supt. of Substations
S. Garver.....Co-operative Assistant in Agronomy
C. M. Woodworth.....Eureka Substation
M. Champlin.....
(Co-operative) Asst. in Agronomy, Highmore Substation
J. V. Bopp.....Assistant Chief in Agronomy
W. L. Burlison,.....Chief Assistant in Agronomy
W. D. Griggs.....First Assistant in Agronomy
H. H. Biggar.....Assistant in Agronomy
O. E. White.....Assistant in Botany
J. H. Sarvis.....Assistant in Botany
William White.....Assistant in Dairying
D. E. Bailey.....Assistant in Dairying
Howard Loomis.....Assistant in Agronomy
R. A. Larson.....Secretary and Accountant
M. M. Johnson.....Bulletin Clerk and Stenographer

BREEDING AND FEEDING SHEEP

James W. Wilson.

Sheep-farming has been practiced since the earliest times, and is one of the most profitable branches of the live stock industry. The modern breeds are the result of careful selection and breeding of those best adapted to the various localities, each breed being established for distinct purposes. Soil, climate and feed in these localities determined to a large extent the characteristics of the breed.

Nearly all of the common breeds are of foreign origin, and the two controlling factors in their development were the production of mutton and the production of wool.

The sheep has been termed the plant scavenger of the farm. In fact, there are very few plants sheep will not eat during some stage of its growth, and yet the cured fodders and grasses must be of the best quality to obtain the best results in feeding operations.

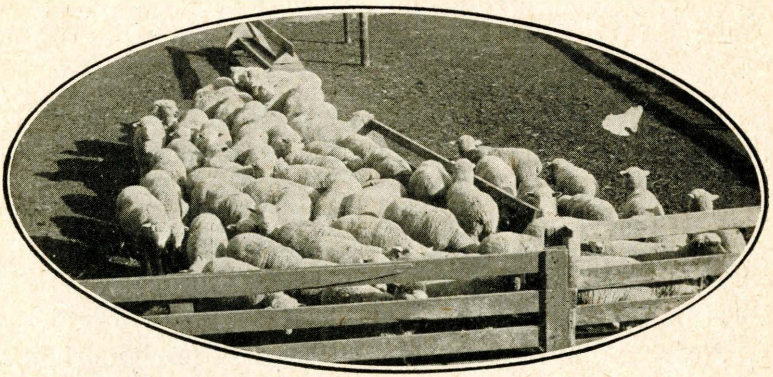
Sheep require less pasture than any other animal on the farm. After the grain is cut and stacked, sheep are turned on the stubble to eat the weeds which otherwise would go to seed.

Many farmers make a practice of turning lambs into the corn field in the early fall to gather up all the weeds.

Many farmers in the corn belt sow rape with the grain to furnish additional feed since this affords an abundance of succulent forage late in the season up to the time of severe frosts.

Bulletin 119 of this Station (edition exhausted) reports an average gain on lambs in a two year's experiment pasturing sheep on rape of .34 and .37 of a pound daily. This gain is larger for the same breed, and was made much cheaper than the gain made by any of the lots in this six years' experiment where grain and oilmeal were fed.

A brief history of each of the six breeds used in this experiment is given to show the similarity in their blood lines. In this connection it will be noted that the oldest and best established breeds were the strongest breeders.



EWES

THE EXPERIMENT.

The object of this experiment was to ascertain which of the following named breeds of sheep is the best to use on the western bred ewe, both wool and mutton being considered.

In the fall of 1904 sixty head of western Montana bred yearling ewes were purchased and divided into six different lots of ten head each. These ewes were quite uniform in size and conformation. Some had more Merino blood than others, and some had more Down blood but all were compactly built. Their fleeces were light compared to fleeces of sheep kept under home conditions. These ewes were easy keepers. After lambs were weaned in fall they would fatten quicker and be in better shape for winter than ewes of some of the pure bred flocks kept under the same conditions. Each of these lots was bred to an average pure bred ram of the following breeds: Cotswold, Hampshire, Oxford, Southdown, Shropshire and Rambouillet.

In 1905, the ewes bred to the Cotswold were bred to the Hampshire and the ewes bred to the Rambouillet were bred to the Cotswold, and so on for each lot changing breed of ram each year for each lot of ewes. This furnished lambs from each lot of ewes each year by ram of different breed. The same ram was not used for the six years in any case, but an average ram of the breed was used.

The lambs were lambed during the latter part of April and first part of May each year. The lambs were allowed to run with the ewes each year on blue grass pasture until early fall, when they were separated and put in a field of rape pasture where they grazed until freezing weather. On January 1, they were divided up as to breeds and fed until April 1st, when they were sheared and shipped to the Clay Robinson & Co., commission firm at Chicago and sold on their merits..

The wool was shippel to H. T. Thompson & Co., Chicago, graded and sold on its merits.

The grain ration was weighed out morning and evening and each lot was given all it would eat up clean of a mixture of 100 pounds of shelled corn, 100 pounds of oats and 25 pounds of oil-meal. Each lot was given all the upland prairie hay it would eat.

The experiment of 1908 was not as successful as those for the other five years on account of an accident in early fall of 1907. The number of pounds of feed for a pound of gain was larger on account of the quality of the feed, but the results are similar for each lot during that year.

The number of ewes diminished as the experiment progressed until in 1910 there were but 35 remaining.

During the spring of 1910 ten of the ewes died and three affected were turned over to the Veterinarian of the Station for post-mortem examination. The winter of 1909-10 was the worst we had during this experiment. The snow was deep and there were few pleasant days the ewes would take exercise. The following is a diagnosis by

Dr. E. L. Moore, Veterinarian of this Station, as to the cause:

"I have carefully examined several of the western ewes that have been dying and I find a condition similar to that found among many of the sheep of this locality at this time of the year. That is, in all of these cases it will be found that the liver is soft, yellow or clay-colored and soft and friable; in addition there is a catarrhal condition of the intestines, the feces being hard and coated with mucus. From an observation extending over several years I have no hesitancy in attributing this to lack of exercise and the long period of dry feeding during the winter. As soon as these sheep are able to be turned out and get to grass the death rate stops, but when kept under the conditions under which it has been necessary to keep this band of western ewes a very large death rate is to be expected and there seems to be little chance of stopping it. In explanation of this trouble at this time, and of its absence, heretofore, it is only necessary to remind you that it has been necessary to keep this band under closer confinement that usual and that the supply of roots for feeding has been more limited."

COTSWOLD RAM

The Cotswold was the largest of the six breeds used in this experiment. This breed is not commonly found in the Northwest probably on account of the loose, fluffy nature of its fleece. History shows that it is one of the oldest breeds of sheep of which there is any record. The name is from the Cotswold Hills in England. It is claimed that the Romans in the second century kept this breed of sheep principally for the production of wool. It has been used to cross on other breeds to increase the size and length of staple of wool.

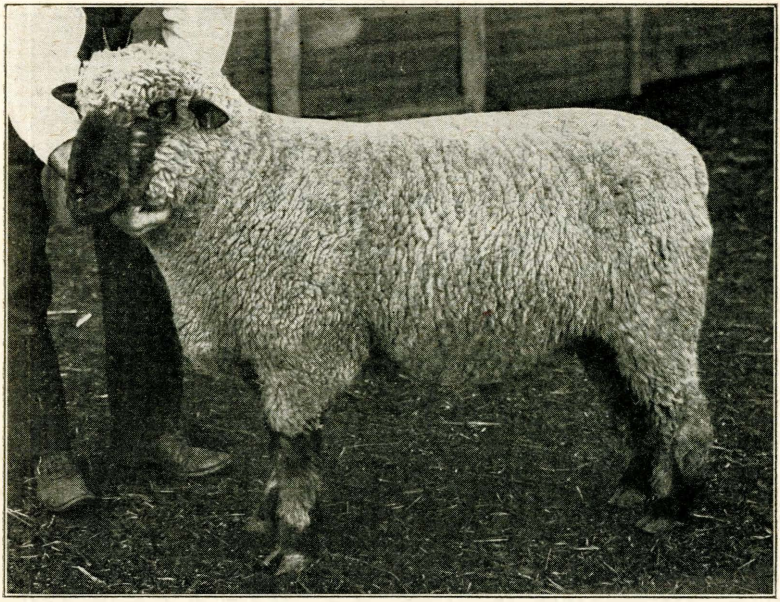
The rams used in this experiment were strong breeders, transmitting to the offspring more of the breed characteristics than any of the other breeds except the Rambouillet.

The flock of pure-bred Cotswolds on the College Farm has not been as rugged as the flocks of the Down breeds, but the lambs from this cross were hardy.

LAMBS

Western Bred Ewes by Pure Bred Cotswold Ram

Number of lambs in experiment	1906 9 from 9 ewes	1907 12 from 10 ewes	1908 5 from 5 ewes	1909 14 from 8 ewes	1910 10 from 8 ewes	1911 7 from 4 ewes
Number of lambs fed	9	12	5	14	8	7
Number of days fed	107	104	91	105	104	104
Average weight at beginning	94	88	85	66	69	59
Average weight at close, including wool	135	124	124	100	99	100
Average gain per head	41	36	39	34	30	41
Average gain per head daily	.39	.34	.43	.32	.29	.39
Total concentrates fed	2024	2395	944	2614	1355	1350
Concentrates for pound of gain	5.42	5.50	4.81	5.46	5.57	4.70
Selling price on Chicago markets.....	$5.80	$7.50	$7.15	$7.05	$9.50	$5.25



HAMPSHIRE

This is a comparatively new breed of mutton sheep in the Northwest, but one of the oldest of the Down breeds of England. In 1861, The Royal Agricultural Society of England recognized this as a distinct breed, but it existed several years previous to this time. As with the Shropshire, this breed was also repeatedly crossed with the Southdown to improve its quality. The original strain had long coarse legs and a coarse body throughout.

The present day Hampshire is noted for its large weight at an yearly age and is perferred for this reason by many breeders. However, Hampshires are not as compactly built as the Shropshires and not considered as desirable by the butcher on account of the large bones.

The wool is shorter in staple than with the Shropshire and they do not when matured yield as much per head.

Black wool and hair where there should be wool, in the pure-breds should not be tolerated.

Rams of this breed did not impress their qualities on the offspring as strongly as did rams of the Cotswold and Rambouillet breeds.

Nine years experience with the Hampshire shows it to be perfectly hardy in South Dakota.

LAMBS

Western Bred Ewes by Pure Bred Hampshire Ram

Number of lambs in experiment	1906 10 from 10 ewes	1907 11 from 10 ewes	1908 6 from 5 ewes	1909 13 from 9 ewes	1910 11 from 8 ewes	1911 9 from 6 ewes
lambs fed	10	11	6	11	9	8
Number of days fed	107	104	91	105	104	104
Average weight at beginning	88	91	82	77	73	64
Average weight at close, including wool	124	126	106	115	102	98
Average gain per head	36	35	24	38	29	34
Average gain per head daily	.35	.33	.26	.36	.28	.32
Total concentrates fed ...	2022	2214	1020	2213	1685	1516
Concentrates for pound of gain	5.33	5.57	6.98	5.34	6.37	5.63
Selling price on Chicago markets.....	$5.80	$7.50	$7.15	$7.05	$9.50	$5.25

OXFORD

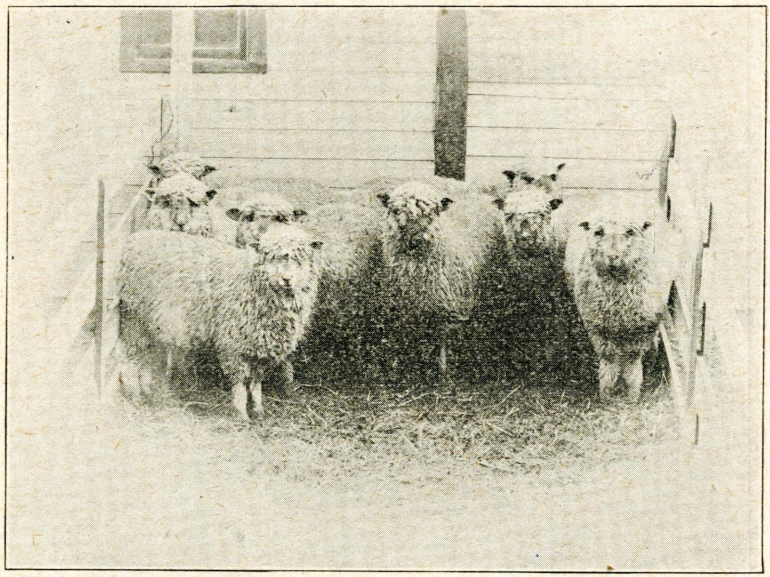
The Oxford is the largest of the Down breeds of sheep. It has in its value the blood of the Southdown, the Hampshire and the Cotswold breeds. It was originated about 1830, but the present day sheep is the result of great care and selection since that time.

The object in originating this breed was to secure a better quality of mutton than that produced by the long-wooled breeds of sheep, and a better quality and a larger quantity of wool than that produced by the short wooled breeds. In England it is considered by many the best breeds of sheep not only for the producer, but for the butcher.

There are comparatively few breeders of Oxfords in the Northwest.

Like the other Down breeds of sheep used in this experiment the breed characteristics were not as uniformly transmitted to the lambs as with some other breeds.

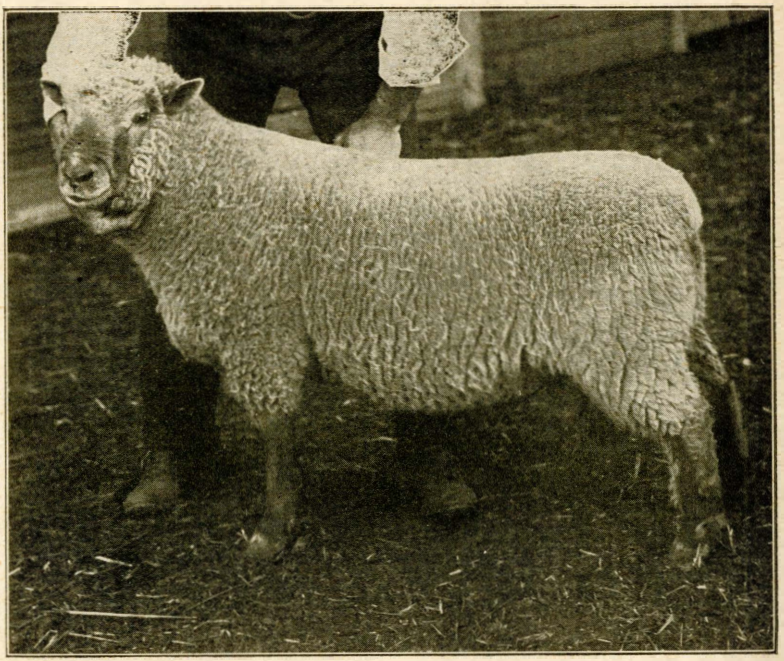
Nine years experience shows that the pure-bred flock on the College Farm is perfectly hardy under our conditions.



LAMBS

Western Bred Ewes by Pure Bred Oxford Ram

Number of lambs in experiment	1906 9 from 9 ewes	1907 12 from 10 ewes	1908 7 from 7 ewes	1909 9 from 7 ewes	1910 12 from 9 ewes	1911 9 from 7 ewes
Number of lambs fed	9	12	7	8	8	9
Number of days fed	107	104	91	105	104	104
Average weight at beginning	94	90	92	76	72	67
Average weight at close, including Wool	129	124	118	116	106	106
Average gain per head	35	34	26	40	34	39
Average gain per head daily	.37	.33	.28	.38	.32	.36
Total concentrates fed	1925	2373	1218	1619	1370	1717
Concentrates for pound of gain	5.36	5.83	6.24	5.07	5.13	4.99
Selling price on Chicago markets.....	$5.80	$7.50	$7.15	$7.05	$9.50	$5.25



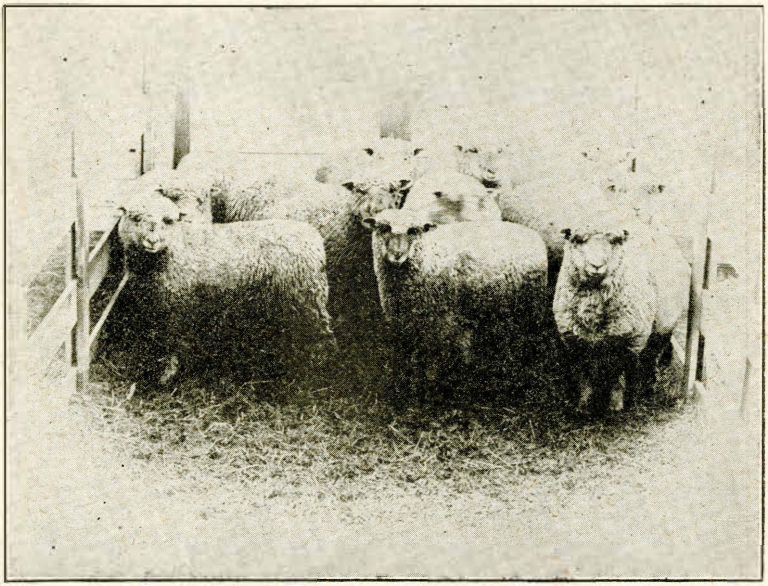
SOUTHDOWN

The Southdown was the smallest breed of sheep used in this experiment. This breed belongs to the short-wool class and is not commonly found in the Northwest. For quality it is unexcelled in the markets. Each year the butchers selected these lambs as being the best for the market. Indeed, the mutton from this breed of sheep commands the best price in the market on account of its quality.

This breed has been used to improve the quality of some of the other Down breeds of sheep to a larger extent than has any other distinct breed. Its low set, broad back, well sprung rib, full leg and stylish appearance make it attractive wherever found.

This breed has a comparatively dense fleece of good quality but short in staple. The cross on the western bred ewe was a good one, the lambs being good feeders, but were smaller than other breeds when finished.

The nine years experience with the pure-bred Southdown flock on the College Farm shows it to be hardy under our conditions.



LAMBS

Western Bred Ewes by Pure Bred Southdown Ram

Number of lambs in experiment	1906 10 from 10 ewes	1907 14 from 10 ewes	1908 4 from 4 ewes	1909 12 from 7 ewes	1910 12 from 8 ewes	1911 6 from 5 ewes
Number of lambs fed	10	14	4	12	7	6
Number of days fed	107	104	91	103	104	104
Average weight at beginning	76	76	80	66	70	66
Average weight at close, including wool	108	103	108	96	92	99
Average gain per head	32	27	28	30	22	33
Average gain per head daily	.30	.25	.32	.28	.21	.32
Total concentrates fed	1738	2373	627	1967	879	1095
Concentrates for pound of gain	5.41	6.41	5.45	5.50	5.67	5.42
Selling price on Chicago markets	$5.80	$7.50	$7.15	$7.05	$9.50	$5.25

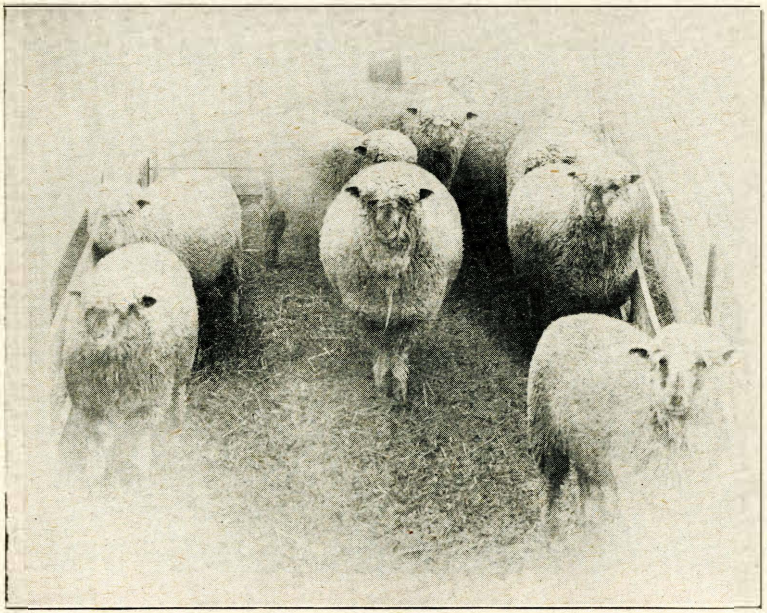
SHROPSHIRE

This is the most popular of all the Down breeds of sheep. In 1859 it was recognized in England as a distinct breed and was permitted to compete in the shows as such.

On Morfe Common near Brignorth, England, there was found a small, black-faced horned variety of sheep that did not shear over two pounds of wool per head. From this strain the present Shropshire was originated. The Southdown breed was used to give them quality of body and wool and the Leicester was used to produce size. By using these two hornless breeds of sheep and by rigid selection the horns have been eliminated.

The Shropshire is a medium sized sheep, dark colored face and legs, has a dense fleece of comparatively fine wool which is longer in staple than that of the Southdown, is hardy and very prolific under our conditions.

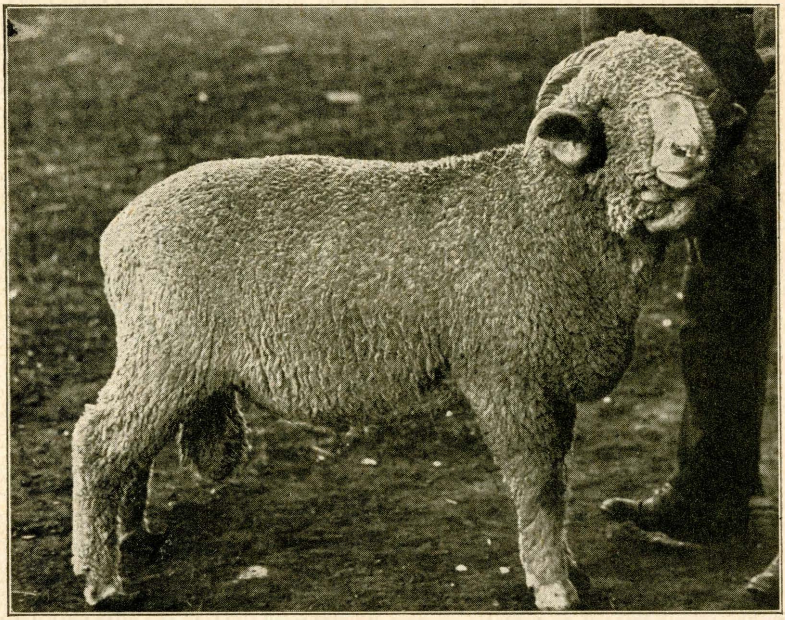
Black spots on the skin and black wool are objectionable among the pure breds. The breed characteristics of the lambs coming from crossing this breed and the common ewe were not so prominent as they were in the lambs sired by the Cotswold and Rambouillet rams.



LAMBS

Western Bred Ewes by Pure Bred Shropshire Ram

Number of lambs in experiment	1906 8 from 4 ewes	1907 12 from 10 ewes	1908 8 from 5 ewes	1909 11 from 7 ewes	1910 12 from 8 ewes	1911 7 from 6 ewes
Number of lambs fed	8	12	8	11	11	7
Number of days fed	107	104	91	105	104	104
Average weight at beginning	84	83	75	70	61	64
Average weight at close, including wool	120	113	94	103	93	106
Average gain per head	36	30	19	33	32	42
Average gain per head daily	.34	.29	.21	.32	.30	.40
Total concentrates fed	1575	2146	1045	2217	1928	1404
Concentrates for pound of gain	5.39	5.89	6.83	6.04	5.54	4.80
Selling price on Chicago markets	$5.80	$7.50	$7.15	$7.05	$9.50	$5.25



RAMBOUILLET

The Rambouillet breed was originated by the French Government at a place by this name only a few miles from Paris. It is one of the oldest breeds of sheep in existence and is used quite generally under range conditions in the Northwest. It is claimed that they will flock together better and on account of their dense fleeces are better able to withstand the sudden changes of temperature than any other breed.

The foundation stock was the Spanish Merino imported from Spain in the year 1786. The size of the sheep and the weight of the fleece were increased without losing the quality of the fibre.

The modern Rambouillet has fewer wrinkles in his skin than the Merino and is preferred by many on this account.

The lambs from this breed of sheep and the grade ewes possessed the characteristics of the breed stronger than those from any other breed used.

The pure-bred Rambouillet on the College Farm is hardy and well suited to our conditions.

LAMBS

Western Bred Ewes by Pure Bred Rambouillet Ram

Number of lambs in experiment	1906 7 from 7ewes	1907 10 from 10 ewes	1908 7 from 6 ewes	1909 12 from 7 ewes	1910 10 from 7 ewes	1911 7 from 7 ewes
Number of lambs fed	7	10	7	12	10	7
Number of days fed	107	104	91	105	104	104
Average weight at beginning	83	83	76	66	63	71
Average weight at close, including wool	127	114	100	98	90	109
Average gain per head	44	31	24	32	30	38
Average gain per head daily	.40	.29	.26	.31	.26	.36
Total concentrates fed	1658	1989	940	2383	1523	1353
Concentrates for pound of gain	5.43	6.52	5.06	6.13	5.53	5.13
Selling price on Chicago markets.....	$5.80	$7.50	$7.15	$7.05	$9.50	$5.25

WOOL

The heaviest fleece on record weighed 52 pounds. It represented 13 months growth and was taken from a Merino lamb owned by a firm in Kansas.

The quantity and quality of the fleece is governed by the breed, the feed, the age and the conditions under which the sheep is kept. We must look to breed for certain classes of wool. The demand in the market changes from time to time for these classes depending to a certain extent on the prevailing demand for different classes of dress goods. An inferior class of wool can be produced with any breed, if the feed is not of proper quality. Some showmen make a practice of shearing their sheep early so they will have a longer fleece to trim.

Dipping undoubtedly improves the quality of a fleece by washing out a large per cent of the dirt. Lambs for this experiment were dipped in the fall each year before cold weather.

Lambs in this experiment were between ten and one-half and eleven months old when sheared.

They were sheared two weeks before marketing and the clip was shipped to the H. T. Thompson & Company wool house in Chicago, graded and sold on its merits.

Deducting the cost of shipping the following table shows the average amount per head received annually for each breed.

Net Returns for Wool Per Head

	1906	1907	1908	1909	1910	1911	Average
Cotswold	$2.39	$2.03	$1.20	$1.47	$1.56	$1.04	$1.63
Hampshire	2.03	1.76	.98	1.37	1.30	.82	1.37
Oxford	2.04	1.17	.78	1.58	1.54	1.06	1.36
Southdown	1.48	1.41	.78	1.06	1.20	.77	1.11
Shropshire	1.86	1.73	.82	1.34	1.33	1.13	1.36
Rambouillet	1.88	1.51	.74	1.14	1.27	.94	1.24

The commission firm made the following comments on the quality of the wool.

1907.

"We consider this one of the best lots of wool, taken as a whole, we have ever seen from your state. You will please bear in mind the fact that these wools are better handled and of better value than most clips in the state and prices named would be way out of range for average wools from South Dakota of the same grade. In other words, we do not believe the average run of wools, even if free from burrs, seed and chaff, from South Dakota could be sold in this market today within 3 cents to 5 cents per lb., of these prices.

In making up statements in regard to sale of this wool, we think it would only be fair to the wool growers of your state and to ourselves to give the facts as above stated, for we often hear our sales quoted by many growers and they wonder why we cannot get them as much money as we do for your wool. If they could see them side by side they would readily understand it."

1909.

"We found all of this wool in good condition and as you know, handled better than the majority of wools from your state and therefore commands a better price."

1910.

"We find this to be an exceptionally choice lot of wool, being, we consider, the best we have ever seen from the state of South Dakota. All of the wools are very choice as to condition and will command the highest market price for wools of their grade and kind."

1911.

"All of these wools are far better in color than the average wools from your state, caused partially by being shorn so early and further by the excellent care the sheep have undoubtedly received. All of these lots were short staple, due probably to the sheep having been shorn less than a year ago."

The average net selling prices for the different grades of wool during the six years were as follows:

Oxford and Shropshire 20 cents, Cotswold, Hampshire and Southdown 19 cents and Rambouillet 17 cents per pound.

The following table includes the average yield of wool per head by breeds.

Average Yield of Wool Per Head

	Cotswold	Hampshire	Oxford	Southdown	Shropshire	Rambouillet
1906 ..	9.7	8.2	7.5	6.4	7.7	8.5
1907 ..	8.5	7.2	7.0	5.9	6.9	7.2
1908 ..	6.6	6.7	6.7	5.0	5.4	5.7
1909 ..	8.8	6.5	5.5	6.0	5.5	5.7
1910 ..	7.1	6.2	7.3	5.7	5.8	7.1
1911 ..	6.8	5.5	7.1	5.1	7.5	7.2
Ave. ..	7.9	6.7	6.8	5.6	6.4	7.0

DRESSED WEIGHT

The following table shows the per cent that each lot dressed for the last three years of the experiment.

Per Cent Each Lot Dressed

	Cotswold	Hampshire	Oxford	Southdown	Shropshire	Rambouillet
	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
1909	53.1	53.6	53.5	52.3	50.8	56.
1910	49.1	51.2	50.6	50.1	50.4	50.3
1911	55.2	55.6	54.6	57.0	58.5	56.5
Ave.	52.4	53.4	52.9	53.1	53.2	54.2

The table shows that the Rambouillet cross was the largest and the Cotswold the smallest dresser.

With the 1910 lots the packers quote the Hampshires and the Rambouillets lambs the "best dead" of the six lots.

The general criticism before slaughter was that the Cotswold were too leggy and too heavy, the Hampshires and Oxfords too heavy, the Rambouillet not smooth enough but the Southdowns and the Shropshires, with a few exceptions, meeting the demand of the market.

Totals for Six Years

Breed	No lambs fed	Ave. gain per head daily	Ave. Lbs. concentrates for Lbs. gain	Ave. value of wool per head
Cotswolds	55	.36	5.24	$1.63
Hampshires	55	.31	5.87	$1.37
Oxfords	53	.34	5.43	$1.36
Southdowns	53	.25	5.64	$1.11
Shropshires	57	.31	5.75	$1.36
Rambouillets	53	.31	5.63	$1.24

From the above table it will be seen that the Cotswold lambs made the largest gain per head daily, required the least quantity of grain and produced a fleece that brought twenty-six cents more per head than any other breed. Of the Down breeds the Hampshire, Shropshire and the Oxford were about equal in value of fleece per head, but the Hampshires and Shropshires required 44 hundredths and 32 hundredths more grain for a pound of gain than did the Oxfords.

Eighteen of the 344 lambs lambed died before reaching market. The cause of their death was due principally to worms, but several were lost through accident. The worms were more severe on the weakest lambs of the flocks. As a remedy for this disease the instructions by Dr. E. L. Moore from Press bulletin No. 2 of this Station were followed with good results:

TAPE WORMS IN SHEEP

The frequent number of cases in which loss of lambs from parasites is reported, the predominance of tapeworms in most of the cases which have been submitted for autopsy, and the exhaustion of Bulletin No. 78, entitled "A Preliminary Report on the Fringed Tapeworm of Sheep," indicate the necessity for publishing the essential features of this bulletin in press bulletin form. While the copper sulphate treatment has been employed by us for tapeworms alone, the indications are that the same treatment will prove efficient for stomach worms and other round worms also.

SYMPTOMS—Lambs which should be thrifty do not do well, scour badly, and gradually die. A more careful examination shows that the mucous membranes of the eyes are pale and bloodless; soft swellings, in the more advanced and chronic cases, appear under the throat and in the neighborhood of the neck; the gait becomes feeble, and the body emaciated. Such symptoms are not characteristic of any one particular parasite, but may be found in any parasitic disease of sheep that is accompanied by mortality. If effected with tapeworms, however, segments of these worms will appear with more or less regularity in the droppings, as distinct whitish masses. Post mortem examinations should be made to verify the diagnosis.

TREATMENT—Treat each individual of the flock. It may not itself be seriously suffering from the worms, but it may aid in the further infestation of the flock and occasion additional loss.

Keeping the sheep shut up and away from food for twenty-four hours before treating.

Dissolve one ounce of copper sulphate (bluestone) to two quarts of water and give to each individual a dose as indicated in the following table:—

For a lamb 3 months old give 2-3 of a fluid ounce (20 cc.)

For a lamb 6 months old give 1 1-2 fluid ounces (40 cc.)

For a sheep 1 year old give 2 1-2 fluid ounces (60 cc.)

For a sheep 2 years old give 3 1-2 fluid ounces (90 cc.)

PRECAUTIONS—Use copper sulphate of a uniform blue color, without any whitish crusts, or in conglomerate lumps.

Do not guess at weights or measures. Have your druggist weigh the bluestone; and have him graduate your drenching bottle by marking the appropriate doses with a file.

Do not allow the sheep to have access to water for several hours after dosing.

Should any of them receive an overdose, indicated by lying apart from the rest of the flock, purging, and showing symptoms of pain, place in a shady place and give a teaspoonful of laudanum in a tumbler full of milk.

Provide your sheep with a rotation of pasture. This does not mean that the sheep should be changed from one pasture to another every few weeks or months, but every year or so put them on a pasture on which no sheep have ranged for at least one year. While no one has as yet discovered the intermediate host or hosts of any of the tapeworms of the herbivora, yet they probably pass part of their life in some of the lower animals or insects. This is why a rotation of pasture is so strongly emphasized in trying to rid a flock of sheep from parasites.

E. L. MOORE,
Veterinarian.