Two Years' Results on Production Early Spring Lambs

Thesis on Degree M. Agriculture

Charles Albert Willson

1922

THESIS

TWO YEARS' RESULTS ON PRODUCTION OF EARLY SPRING LAMBS.

1. Influence of Top Crosses of Different Breeds on Common Ewes.
2. Comparison of Dark-Faced and White-Faced Ewes.
3. Effect of Condition of Ewes at Breeding Season.
4. Effect of Driving Ewes Before Turning in of Rams.

Presented by

C. A. WILLSON '06

for Degree

MASTER OF AGRICULTURE

October 1, 1922.

THESIS

THE INFLUENCE OF TOP CROSSES OF DIFFERENT BREEDS ON COMMON EWES IN THE PRODUCTION OF MARKET LAMBS

by

C. A. Willson

Tennessee has been one of the foremost states in early spring lamb production, and offers an excellent opportunity for the expansion of this industry. The method that has been effectively employed by spring lamb producers in this State is to purchase common ewes from the states lying to the south and use one of the black-faced Down breeds for the top cross. Many problems have arisen in this industry which will be studied in an experimental way at the Middle Tennessee Experiment Station. There has been much debate among the producers, as to which of the black-faced Down breeds is most suitable for use as a top cross on common ewes in early spring lamb production. The present bulletin is a preliminary report on the use of Southdown, Shropshire, Hampshire and Oxford Down rams on common ewes. Data are also given on the effect of driving ewes before turning rams in at the breeding season, number of lambs of each sex produced, average birth weight of lambs of each sex, and conditions affecting the production of twin or single lambs.

PART I. 1920-21.

On July 26, 1920, 110 common ewes with unbroken months were purchased for the experiment. Most of the ewes had white faces, the remainder had black faces, but did not show striking breed

NOTE: The experiments were conducted under the immediate supervision of Mr. C. M. Hume, Acting Superintendent of the Middle Tennessee Experiment Station at Columbia.

characteristics except in a few cases. After the purchase of the flock by the Experiment Station, they were on August 13, 1920 divided into four equal flocks, weighed on large platform scales by groups, and labeled, then individual weights were obtained. The group weights were as follows:

Group I. 28 ewes, 2940 lbs.
" II. 28 ewes, 2940 Lbs.
" III. 27 ewes, 2845 lbs.
" IV. 27 ewes, 2845 lbs.

Dat a were collected in each case with regard to the condition of flesh, weight, color, health, whether the ewe had a long tail, whether bare on belly, and the approximate amount of breeding, if any.

In addition to the above, on August 14 the four flocks were brought in and each flock divided into halves. One-half was turned into one common flock and given a drive of 17 miles on the highway. Upon returning from the drive in the late afternoon, they were sorted out and turned back to their respective flocks. The rams were then turned in with the respective flocks.

Below is a list, by group and number, of the sheep that were taken on the 17 mile drive.

Sheep taken on 17 mile drive August 14, 1920.

Group I No.	Group II No.	Group III No.	Group IV No.
22	31	69	97
6	33	78	85
10	29	74	100
27	36	61	92
19	46	57	107
24	39	82	93
2	40	70	84
23	52	68	109
5	51	72	102
20	41	63	105
15	35	76	110
16	49	77	91
8	53	75	90
1	55		
	50		

The reason for taking one-half of each flock on a long drive before turning the rams with them was to test the theory existing for many years among Tennessee sheepmen, that if ewes are given a long drive before the ram is turned withthem they will breed much earlier. The theory is that a long drive has the same effect on the ewes as flushing.

Fig. 1. Ewes used in experiment work. Picture taken August 6, 1921.

Fig. 2. Ewes used in experiment work. Picture taken August 6, 1921.

Breeds Used in Top Crossing

The groups were headed by rams of four breeds, Group I, headed by a Southdown ram; Group II, headed by a Shropshire ram; Group III, headed by a Hampshire ram; and Group IV, headed by an Oxford Down ram. These breeds were selected for three reasons: (1) They represent those commonly used in spring lamb production in Tennessee; (2) there is a gradation in size from the Southdown to the Oxford Down; (3) and they were all of the black-faced breeds. Each ram used was strong, vigorous, and thoroughly typical of the breed. On August 13, the Southdown ram was described as 140 pounds in weight, three years of age, and in good condition; the Shropshire ram 149 pounds in weight, one year old, and in good condition; the Hampshire ram 168 pounds in weight, one year old and in thin condition. On October 28, the Shropshire ram died from an unknown cause, and immediately a two-year-old prize winning ram was purchased from a reputable breeder to take his place.

Handling of the Flock During the Fall and Winter

Each flock was kept in a separate enclosure, the fences of which had been carefully examined to see that there were no openings where sheep of one flock could get through and become mixed with another flock. Each flock was changed to a different pasture every two weeks during the breeding season, usually to a fresh pasture. Where this could not be done, the flocks were rotated on their respective pastures. This was done in order that the conditions for the various flocks should be as nearly alike as possible. On October 15 all rams were taken away from their flocks for five days, and on October 21 the Hampshire ram was put with the flock that had been headed by the Southdown ram. On October 28

the Shropshire ram referred to above was purchased and put with the flock which had been headed by the Oxford ram. The Oxford ram was in the barn from October 14 to November 7 on account of foot-rot, and was than put with the flock that had been headed by the Shropshire ram. The Southdown ram had also experienced the same difficulty, and was not put with the flock that had been headed by the Hampshire ram until November 10. All rams continued with the flocks as above outlined until December 15. The reason for the change of rams was that there is always a possibility of a ram being sterile, and the change of rams to the various flocks doubled the chances of each flock of ewes being safely bred.

The weights of the fleeces of wool of the above rams on May 19, 1921, were as follows:

Southdown ram, 8 pounds

Shropshire ram, 12 pounds

Hampshire ram, 11 pounds

The Oxford ram died during the winter, having been injured in fighting with the Hampshire ram.

After the rams were removed from the flocks on December 15, all flocks were turned into one common flock and grazed throughout the winter months on crimson clover rye. They were in the barn only two days during the winter, and were fed hay and grain for only four feedings. During the spring months, the ewes lambed on crimson clover and rye fields and on crimson and red clover fields, and were continued on pasture of this character until the lambs were sold. The lambs or ewes were not given grain except for the four feeds mentioned. The flocks

during the breeding season were salted and counted twice each week, as was the common flock throughout the winter months. They had access to water at all times.

Descriptions of Ewes.

Tables 1, 2, 3 and 4 give weights and descriptions of individual ewes of each group as taken on August 13, 1920; and a column is added which gives weights of each fleece on May 19, 1921. The ages as given for the older ewes were estimated according to the appearance of the teeth. They are not exact for the older ages, but it was noted that when ewes were culled because of broken months on May 27 and July 1, 1921, in each instance they had been rated inthe fall as being of seven or eight years of age.

Table I.

Weights and descriptions of Ewes of Group I.
Weighed A. M. August 13, 1920

No.	Age	Condition	Weight	Description				Wt. fleece May 19, 1921
				Color	Nose	Tail	Remarks	
1	6	Thin	89	Black		----	-------	6
2	4	Thin	117	White		----	-------	6
3	4	Thin	101	White		Long	Label lf. ear Bare belly.	Dead
4	7	Very thin	87	Black Mottled jaw		----	Bare belly	3
5	6	Good	99	Brown Mottled		6 in.	----------	4
6	8	Fair	105	Brown		----	Bare belly	6
7	5	Fair	99	White		Long	Bare belly	6
8	4	Thin	97	Mottled		----	----------	Dead
9	7	Thin	101	Grey Mottled		----	---------	5
10	5	Good	96	Light Yellow		----	Label on top Bare belly may be bred.	2
11	4	Thin	86	White		----	----------	6
12	6	Thin	97	Black-Grey		----	One side udder spoiled. Bare	3
13	5	Fair	107	Light Yellow		----	Bare belly	5
14	6	Thin	91	White		Long	Bare belly & legs	Dead
15	6	Fair	89	Black head		----	---------	Dead
16	2	Fair	94	White		----	No bell	8
17	1	Good	125	Black		Long	½Hampshire	8
18	5	Good	107	Black		----	---------	5½
19	4	Good	91	White		----	½Bare belly	Dead
20	4	Very good	107	Black Mottled		----	Bare belly	6
21	3	Good	104	Black Mottled jaw		---	½Bare belly	6
22	5	Good	124	Very black		5 in.	½Bare belly	6
23	4	Extra good	127	Mottled		----	¾Bare belly	6
24	6	Fair	103	Light Yellow		Long	Bare belly	3
25	5	Thin	108	All black		5.in.	Long legged	5
26	4	Good	118	Brown		-Long	½Bare belly	6
27	7	Fair	110	Yellow		Long	May be bred	4
28	4	Good	107	Dark brown		----	Left ear cropped	5

Table 2

Weights and descriptions of Ewes of Group II.
Weighed A. M. August 13, 1920

No.	Age	Condition	Weight	Color	Tail	Remarks	Wt. of fleece May 19 1921
29	4	Fair	116	Black	----	Bare belly	5
30	4	Fair	112	White	----	May be bred	4
31	6	Good	87	White	----	Bare belly	5
32	7	Thin	93	Mottled	---	---------	5½
33	5	Fair	108	White	Long	---------	6
34	4	Good	90	Gray	Long	Bare belly	5
35	3	Good	116	Brown-Gray	---	---------	Dead
36	6	Fair	87	Gray brown	---	Bare belly	Dead
37	1	Good	92	Mottled	Long	---------	5
38	8	Thin	77	White	----	Lame lf. hind foot	3
39	2	Fair	108	Brown	Long	½ Oxford	Dead
40	4	Good	133	Black	----	½ Oxford; new bell	7
41	2	Extra good	123	Black	----	½ Bare belly	5
42	4	Good	98	Black	Long	Bare belly	5
43	2	Good	101	White	----	¾ Bare belly, Bell	4
44	2	Fair	93	Mottled gray	Long	½ Bare belly	4
45	2	Good	98	Brown	----	¼ Southdown	3
46	3	Good	113	Black	----	½ Oxford	6
47	6	Fair	88	Brown	----	Cropped lf. & label lf.	5
48	7	Very thin	92	White	Long	Bare belly, label on top; V notch both ears	6
49	3	Good	123	Black	----	½ Oxford	6
50	4	Good	105	White	Long	Bare belly	6
51	4	Good	101	Brown	Long	May be bred	7
52	4	Good	111	White	----	----------	3
53	1	Good	95	White	5 in.	Bare belly	5
54	6	Fair	90	Black	-----	Short crop lf. ear	4
55	4	Good	90	White, little yellow	6 in.	½ Bare belly	5
56	3	Good	100	White	----	Bare belly	3
			2840 #				

Av. 101#

Table 3

Weights and Descriptions of Ewes of Group III.
Weighed P. M. August 13, 1920

No.	Age	Condition	Weight	Color	Tail	Remarks	Wt. of fleece May 19, 1921
57	1	Good	102	Black	Long	¼ Hampshire	6
58	2	Fair	103	All black	----	----------	8
59	5	Good	109	Darkbrown	Long	Bare belly	4
60	3	Good	107	Brown	----	Bare belly	4
61	5	Thin	70	White	----	Bare belly	3
62	4	Fair	105	Black	6 in.	----------	7
63	5	Fair	93	White	----	Bare belly	2
64	8	Fair	93	White, little yellow	----	Bare belly	4
65	4	Good	135	Darkbrown	----	New bell	Dead
66	5	Good	98	White	---	Very bare belly	2
67	2	Good	93	Black	----	Bare belly	4
68	6	Good	121	Black	---	¼ Hampshire	5
69	2	Thin	99	White	----	Long wool	5
70	5	Good	136	Mottled	----	---------	4½
71	5	Very Good	101	White	---	Bare belly; difficult breathing	4
72	6	Thin	113	Dark-mottled	6.in.	----------	Dead
73	8	Fair	108	Mottled-gray	7 in.	Broken mouth, scurs	5
74	5	Good	110	White	4 in.	Bare belly, label lf.	6
75	5	Fair	98	White	----	---------	8
76	4	Fair	96	Dark-brown	---	½ Bare belly	Lost
77	6	Fair	108	Brown	----	----------	6
78	4	Fair	81	Yellow-brown	----	½ Bare belly	4
79	5	Fair	88	White	----	Label on top	3½
80	6	Fair	54	White	----	Bare belly	4
81	4	Good	106	Black face gray cheeks	---	Bare-belly	4
82	6	Good	104	White	----	----------	4
83	4	Fair	90	White	----	----------	Dead
			2721#	average 101#			

Table 4

12

Weights and Descriptions of Ewes of Group IV.
Weighed P. M. August 13, 1920

No.	Age	Condition	Weight	Color	Tail	Remarks.	Wt. of fleece May 19, 1921
84	8	Good	102	Black		-------	3
85	7	Thin	126	Black		½Oxford; ½ bare belly;newbell	5
86	5	Fair	77	White		Bare belly	3
87	4	Fair	112	White	Long	Label on top; bare	6
88	5	Good	95	Black		Label on top; triple split rt. ear;both cropped	8
89	3	Very good	132	Brown		½ Southdown; bare	5
90	2	Fair	78	White face yellow spots		----------	3
91	4	Good	106	Black		----------	6
92	3	Fair	83	Brown		----------	5½
93	5	Thin	90	Black	Long	----------	7½
94	3	Fair	98	White		Very bare shoul- ders,neck & belly	Dead
95	1	Fair	90	White	Long	Label on lf.ear	7
96	2	Very good	100	White		Cropped rt.ear; bare belly;label lf. ear	4
97	5	Very good	61	Gray-black		Bare belly	6
98	3	Good	126	Brown		½ Southdown	4
99	6	Fair	108	Mottled		½ bare belly	4
100	2	Good	102	Mottled	6 in.	½ Bare belly	8
101	8	Fair	98	Gray		Lbel on top; bare;both cropped; double slit rt.ear	4
102	2	Good	110	Black		----------	8
103	5	Thin	77	White		Label on top	6
104	1	Fair	85	White		Bare belly	5
105	5	Good	121	Black, gray cheeks		---------	5
106	3	Good	102	Yellow	Long	Mother of lamb one wk.	7
107	4	Thin	82	light, mouse color	Long	Bell	Dead
108	5	Good	87	White		½ Bare; label top;ears badly slit.	3
109	2	Good	83	Brown		--------	6
110	3	Good	112	Mottled		Bare belly	Dead

2643# average 98#

In order to test the fairness of the division of the flock into the four smaller flocks, Table 5 has been prepared, being a summary of Tables 1, 2, 3 and 4.

Of the 110 ewes purchased and used in the experiment, there were, according to age, 6 yearlings, 14 two-year-olds, 12 three-year-olds, 27 four-year-olds, 23 five-year-olds, 16 six-year-olds, 6 seven-year-olds, and 6 eight-year-olds.

Table 5--Summary of Description of Ewes

Av. age Yrs.	Av. Wt. Lbs.	Black Faces	Brown Faces	Mottled Faces	White Faces	Yellow Faces	Long Tails	Bare Bellies	Condition Thin	Fair	Good
Group I											
4.89	103.07	9	3	5	7	4	7	13	10	7	11
Group II											
3.96	101.42	7	6	3	12	0	10	13	3	8	17
Group III											
4.62	100.77	6	6	3	12	0	2	13	3	12	12
Group IV											
3.92	97.88	8	5	3	10	1	5	9	4	9	14

It will be noted that there was little variation in the average age of each group; also but little variation in each one of the other respective descriptions of the ewes of the different groups. The average age of Group I was 4.89 years; of Group II 3.96 years; of Group III, 4.62 years; of Group V, 3.92 years, and the average weights were as follows: Group I, 100.07 lbs; Group II, 101.42 lbs; Group III, 100.77 lbs, and Group V, 97.88 lbs. Other characteristics of each group were equally well balanced.

Considering the fact that 20 of the 110 ewes were classed as "thin" on August 13 and also that 7 died of Hemorrhagic Septicaemia during January, February, and March, the losses were not unusual. The number lost out of each group was as follows: Group I, 5 ewes; Group II, 3 ewes; Group III, 4 ewes; and Group V, 3 ewes. Of the ewes lost, one was classed in the fall as a yearling, 2 were classed as three-year-olds, 7 as four-year-olds, and 4 as six-year-olds; or 16.65 per cent of the yearlings, none of the two- year-olds, 16.65 per cent of the three-year-olds, 25.9 per cent of the four-year-olds, 43.6 percent of the six-year-olds, and none of the five-seven- and eight-year-olds. Twenty-five percent of those classed as thin in the fall died; 19.5 per cent of those classes as fair, and but 5.6 per cent of those classed as in good condition.

Management of Ewes and Lambs During Lambing Season

The ewes began to lamb January 21 on open fields of crimson clover and rye, and red clover and crimson clover. The flocks were under observation three or four times each day so that ewes could be assisted in case of difficult lambing. No such assistance was required with any of the ewes. In most cases, first weights of the lambs were taken at 12 hours of age or less. The lambs of one ewe were weighed at 48 hours. Each lamb was given a metal ear tag at time of weighing. All lambs were docked and male lambs were castrated at one to two weeks of age.

Tables 7, 8, 9, 10, and 11 give data as to the ewes that lambed, with a description of each and the sex and birth weight of each lamb.

Table 7--Data on birth of lambs--Group I Ewes

No. of ewes sent on drive	Condition of ewes in August	Age of ewe	Tail or no tail	White or colored face	Date of lambing	No. of lambs	Sex of lambs	Birth weights Lbs.
1	Thin	6	--	C	Apr. 13	1	E	10.0
2	Thin	4	--	W	Feb. 7	1	R	12.0
5	Good	6	--	C	Feb. 1	1	R	7.5
6	Fair	8	—	C	Apr. 8		(E	9.0
						2	(E	9.0
8	Thin	4	--	C	-- --Ewe died			
							(E	11.0
10	Good	5	--	W	Apr. 7	2	(E	10.0
15	Fair	6	—	C	Feb. 2	1	W	9.0
16	Fair	2	--	W	Apr. 13	1	E	10.0
19	Good	4	---	W	-- --Ewe died			
							(E	11.0
20	Good	4	—	C	Apr. 23	2	(E	12.0
22	Good	5	Tail	C	Apr. 13	1	E	13.0
							(E	9.5
23	Good	4	--	C	Feb. 7	2	(R	8.5
24	Fair	6	Tail	W	Apr. 20	1	R	12.0
27	Fair	7	Tail	W	Apr. 8	1	E	11.0
Ewes not driven								
3	Thin	4	Tail	W	-- --	-	--Ewe died	
4	Thin	7	--	C	-- --	-	--No lamb	
7	Fair	5	Tail	W	Apr. 13	1	R	12.0
9	Thin	7	--	C	Apr. 12	1	R	12.0
							(R	7.5
11	Thin	4	—	W	Feb. 13	2	(R	7.0
12	Thin	6	—	C	Apr. 12	1	E	12.5
							(E	9.0
13	Fair	5	--	W	Apr. 13	2	(R	8.0
14	Thin	6	Tail	W	-- —	-	--Ewe died	
							(E	11.0
17	Good	1	Tail	C	Feb. 13	2	(E	11.0
							(E	7.0
18	Good	5	—	C	Feb. 1	2	(E	6.0
							(E	12.0
21	Good	3	—	C	Apr. 20	2	(E	11.0
							(R	8.5
25	Thin	5	Tail	C	Jan. 31	2	(E	7.0
26	Good	4	Tail	C	Apr. 8	1	R	10.0
28	Good	4	—	C	Apr. 12	1	E	12.0

Table 8--Data on birth of lambs--Group II Ewes

No. of ewes sent on drive	Condition of ewes in August	Age of ewe	Tail or no tail	White or colored face	Date of lambing	No. of lambs	Sex of lambs	Birth weights Lbs.
29	Fair	4	--	C	Feb. 3	1	R	12
31	Good	6	—	W	Mar. 7	1	R	10
33	Fair	5	Tail	-	Feb. 27	1	R	11
35	Good	3	--	C	— —	-	Ewe died	
36	Fair	6	--	C	— —	-	Ewe died	
39	Fair	2	Tail	C	-- --	-	Ewe died	
							(E	9
40	Good	4	—	C	May 19	2	(R	8
							(R	9
41	Good	2	--	C	Mar. 12	2	(E	9
46	Good	3	--	C	— —	-	No lamb	
							(E	11
49	Good	3	—	C	Apr. 8	3	(R	8
							(R	8
50	Good	4	Tail	-	Feb. 22	1	E	10
							(R	7.5
51	Good	4	Tail	C	Apr. 27	2	(E	7
							(E	8
52	Good	4	—	-	Feb. 23	2	(R	8
53	Good	1	Tail	-	Feb. 16	1	E	11
							(E	11
55	Good	4	Tail	-	Mar. 7	2	(E	9
Ewes not driven								
30	Fair	4	—	-	Mar. 7	1	R	10
							(R	7.5
32	Thin	7	Tail	C	Feb. 21	2	(E	7.5
34	Good	4	Tail	-	Feb. 16	1	E	10
37	Good	1	Tail	C	Mar. 15	1	E	9
38	Thin	8	—	-	Mar. 12	1	R	7
42	Good	4	Tail	C	— —	-	No lamb	
43	Good	2	--	-	Mar. 12	1	R	11
44	Fair	2	Tail	C	Mar. 8	1	R	12
45	Good	2	—	C	Feb. 25	1	R	11
47	Fair	6	—	C	Feb. 12	1	E	8
48	Thin	7	Tail	-	Mar. 7	1	E	8
54	Fair	6	—	C	— —	-	No lamb	
56	Good	3	—	-	Mar. 7	1	E	10

Table 9--Data on birth of lambs--Group III Ewes

No of ewes sent on drive	Condition of ewes in August	Age of ewe	Tail or no tail	White or colored face	Date of lambing	No. of lambs	Sex of lambs	Birth weights Lbs.
							(R	7.5
57	Good	1	Tail	C	May 15	2	(E	7.5
61	Thin	5	—	W	Feb. 7	1	R	11
63	Fair	5	--	-	Feb. 17	1	E	11.5
68	Good	6	—	C	Feb. 7	1	R	12
69	Thin	2	--	-	May 12	1	E	11
							(E	10
70	Good	5	--	C	Feb. 24	2	(R	10
72	Thin	6	Tail	C	-- --	-	Ewe died	
74	Good	5	Tail	-	Feb. 17	1	E	10.5
75	Fair	5	—	-	Jan. 30	1	R	12
							(E	9
76	Fair	4	—	C	Mar. 5	2	(E	9
							(R	7.5
77	Fair	6	--	C	Feb. 16	2	(R	7.5
78	Fair	4	--	C	Apr. 27	1	R	10.5
							(E	3.5
82	Good	6	--	-	Feb. 1	2	(R	6.0
Ewes not driven							(E	8.0
58	Fair	2	--	C	Feb. 20	2	(R	7.5
							(E	7.0
59	Good	5	Tail	C	Feb. 11	2	(E	8.0
60	Good	3	—	C	Feb. 18	1	E	7.5
62	Fair	4	Tail	C	Feb. 16	1	E	11.0
64	Fair	8	--	-	Mar. 16	1	R	9.0
65	Good	4	--	C	-- --	-	Ewe died	
66	Good	5	--	-	Feb. 28	1	R	10.0
67	Good	2	—	C	Feb. 5	1	E	12.0
71	Good	5	--	-	Feb. 9	1	E	10.0
							(E	11.0
73	Fair	8	Tail	C	Feb. 11	2	(R	10.0
							(R	7.5
79	Fair	5	--	-	Jan. 30	2	(R	7.5
80	Fair	6	—	-	Feb. 1	1	R	9.5
							(E	7.5
81	Good	4	--	C	Feb. 3	2	(R	7.5
							(E	8.5
83	Fair	4	—	-	Feb. 5	2	(R	8.0

Table 10—Data on birth of lambs--Group IV Ewes

No. of ewes sent on drive	Condition of ewes in August	Age of ewe	Tail or no tail	White or colored face	Date of lambing	No. of lambs	Sex of lambs	Birth weights Lbs.
84	Good	8	--	C	----	--	--	No lamb
85	Thin	7	--	C	----	--	--	No lamb
80	Fair	2	--	W	Feb. 18	1	R	12.0
							(R	8.0
91	Good	4	--	C	Mar. 9	2	(R	9.0
							(R	8.0
92	Fair	3	--	C	Feb. 21	2	(R	7.5
							(R	11.0
93	Thin	5	Tail	C	Mar. 12	2	(R	11.0
97	Good	5	--	C	Jan. 21	1	R	12.5
100	Good	2	Tail	C	Feb. 8	1	E	12.0
102	Good	2	--	C	Feb. 6	1	R	12.0
							(E	8.0
105	Good	5	--	C	Feb. 19	2	(R	10.0
107	Thin	4	Tail	-	-- --	--	--	Ewe died
109	Good	2	--	C	May 6	1	R	9.0
110	Good	2	--	C	-- ---	-	--	Ewe died
Ewes not driven								
86	Fair	5	--	-	Feb. 19	1	R	10.0
							(E	7.0
87	Fair	4	Tail	-	Apr. 13	2	(R	7.0
88	Good	5	--	C	Mar. 9	1	R	12.0
							(R	10.0
89	Good	3	--	C	Mar. 9	2	(R	10.0
94	Fair	3	--	-	-- --	-	--	Ewe died
							(R	9.2
95	Fair	1	Tail	-	Feb. 14	2	(E	9.0
96	Good	2	--	-	------	-	--	No lamb
98	Good	3	--	C	Feb. 18	1	E	10.0
99	Fair	6	--	C	Feb. 19	1	R	11.0
101	Fair	8	--	-	Apr. 13	1	R	12.0
103	Thin	5	--	-	Mar. 1	1	E	10.0
104	Fair	1	--	-	Feb. 17	1	R	10.0
106	Good	3	Tail	-	Apr. 20	1	R	7.0
108	Good	5	--	-	Feb. 22	1	E	12.0

Twelve of the ewes died before lambing time. Seven of the ewes that lived through failed to lamb. The whole flock of ewes dropped 127 lambs, or an average for the flock of 1.16 lambs. The average for the ewes that lambed was 1.4 lambs.

Effect of Age upon Production

At the time of taking descriptions of the ewes, in August, 1920, an estimate was made of the age of each ewe. Fairly accurate estimates could be made for the younger ages, but the older ages are merely by the condition of the teeth. The following table gives the result by ages of the production of the ewes:

Table 11--Summary of Birth Data by Ages of Ewes.

Ages yrs.	No. of ewes lambing	No. of lambs dropped	Av. weight of lambs at birth	Per cent of ewes having twins	Av. No. of lambs per ewe of each age
1	6	9	9.49	--	--
2	12	14	11.11	14.3	1.16
3	8	13	9.22	55.3	1.62
4	21	33	9.13	57.1	1.57
5	23	32	9.84	42.5	1.39
6	12	14	9.00	16.6	1.16
7	4	5	9.20	----	----
8	5	7	9.57	----	----
Total	91	127	Average:	39.5	1.39

It is evident from the data shown in Table 11 that a ewe reaches her maximum production at the age of four years, after which there seems to be a steady decline. The per cent of ewes having twins at three years of age was 55.3, and of those at four years 57.1. The average number of lambs per ewe at three years of age was 1.62, at four years 1.57, and at five years 1.39. The number of ewes of three years of age having lambs is a little too small to justify definite conclusions. There seems, however, to be a decline in the per cent of ewes having twins after the fourth year. Of all the ewes lambing, 39.5 per cent had twins, and the average number of lambs per ewe for the 91 ewes that lambed was 1.39.

Effect of Type of Ewe upon Lamb Production

For a number of years there has been a prevalent opinion among lamb raisers of Middle Tennessee that the common white-faced ewes that show but little breeding are better for lamb production than ewes showing some blood of the dark-faced breeds. Since in this experiment there was nearly an equal distribution of white-faced ewes in each flock, there has been an excellent opportunity for studying the difference between these two types of ewes on lamb production. Table 12 shows the apparent effect of type of ewe upon lamb production in this experiment. White faced ewes in this experiment were mostly common Alabama ewes. Dark faced ewes were those of improved breeding.

Table 12--Effect of type of ewe on lamb production.

Description of ewes	No. of ewes lambing	Av. No. of lambs dropped	Av. date of lambing	No. ewes raising lambs to market	Av. wt. of lambs marketed per ewe raising lambs. Lbs.	Av. wt. of lambs marketed per ewe lambing.	Av. daily gain of lambs Lbs.
White faces	41	1.24	March 5	31	82.9	62.7	.82
Dark faces	50	1.52	March 8	48	99.1	95.2	.79

The white-faced ewes dropped an average of 1.24 lambs e ch, and the dark-faced ewes an average of 1.52 lambs each. The average d te of lambing of the white-faced ewes was March 5, and of the dark-faced ewes March 8. The white-faced ewes did not prove as good mothers as the dark-faced ewes. They raised fewer of their lambs to market age, and brought them to market time at a less average weight. The average weight of lambs marketed per ewe raising lambs of the white faces 82.9 pounds, and of the dark faces 99.1 pounds. If we consider all the white-faced ewes that lambed as against all the dark-faced ewes that lambed, the average weight of lambs marketed per ewe of the white faces that lambed was 62.7 pounds, and of the dark faces 95.2 pounds. The average daily gain of lambs of the white face ewes was .82 pounds, and of lambs of the dark faced ewes .79 pound. This apparent discrepancy was due to the fact that the white faced ewes raised more single lambs than the dark-faced ewes. The white-faced ewes produced nine pairs of twins but raised only three unbroken pairs. The dark-faced ewes produced 24 pairs of twins and raised 19 unbroken pairs. Only 75.8 per cent of the white-faced ewes lambing raised one or more of their lambs to market age, against 95.9 per cent of the dark-faced ewes.

Effect of Condition of Ewe on Lamb Production

At the time of the beginning of the experiment, in August, 1920, each ewe was described, with reference to the condition of flesh at that time, as thin, fair, or good. In this respect the four groups were about equally divided, as reference to Table 12 will show. It has been asserted by many lamb breeders that ewes thin in condition would lamb earlier and produce more lambs than those in good condition. Table 13 will show the effect of the condition of the ewes in this experiment on lamb production.

Table 13--Effect of condition of ewe on lamb production.

Condition of ewe	Total No. of ewes lambing	Av. No. of lambs per ewe dropped	Av. date of lambing	No. of ewes raising lamb to market	Av. wt. of lamb* marketed per ewe raising lambs	Av. wt. of lamb* marketed per ewe lambing	Av. daily gain of each lamb
Thin	13	1.31	March 10	12	91.8	84.6	.76
Fair	32	1.34	March 4	24	97.9	73.5	.81
Good	46	1.45	March 7	43	92.7	86.7	.80

*"Lamb" refers to total weight of lambs per ewe in each case.

There were 13 ewes classed as thin, 32 as fair, and 46 as good. The ewes in thin condition dropped an average of 1.31 lambs, those that were fair in condition, 1.34, and those that were good, 1.45. The average date of lambing was practically the same for each group, with the odds in favor of the ewes that were fair to good in condition. The average weight of lamb marketed per ewe for those producing and raising lambs was, for the thin ewes, 91.8 pounds, for the fair ewes 97.9 pounds, and for the good ewes 92.7 pounds. The average daily gains were greater for the lambs produced from ewes in fair to good condition in the fall. The most significant fact brought out by the table is that the ewes that were in fair to good condition dropped a larger percentage of twins than those that were thin.

Effect of Lamb Production of Driving Ewes

In the earlier history of early spring lamb production by farmers in Middle Tennessee, it was the custon to purchase common ewes in the state lying south, or from the Cumberland Plateau in Tennessee, during the month of July or the forepart of August, and then drive them through the country to the farm destination where they were ot be kept during the winter months. After these long drives, the ewes were turned onto the fresh pasture that had been preserved for them by the new owner and the ram turned with the ewes. It was observed that these ewes lambed earlier than the ewes that had been kept throughout the year in the same locality. Hence, the theory arose that if ewes were driven for some distance on the road or about the pasture field before the rams were turned in at the breeding season most of the ewes would immediately come into season, and the birth date of the lambs would be bunched at the

earliest possible date after the ram was turned with the flock. In order to test the accuracy of this theory, each group of ewes was divided into two equal flocks on August 14, 1920, and one each of the flocks was turned into a general flock and driven on the public highway for a distance of seventeen miles. The drive consumed most of the day. On page 3 is given a list of the ewes of each group that were sent onthe drive. Table 14 will show the apparent lack of effedt of driving upon the date of lambing.

Table 14--Results on lamb production of driving ewes.

	No.	No. of ewes lambing	Av. date of lambing	Av. No. of lambs per ewe lambing
Ewes driven	56	44	Mar. 13	1.45
Ewes not driven	54	47	Mar. 3	1.34

For the 56 ewes that were driven the average date of lambing was March 13, for the 54 ewes not driven the average date of lambing was March 3. The ewes not driven lambed, on the average, ten days earlier than the ewes that were driven. The average number of lambs dropped per ewe was in favor of the ewes that were driven, being 1.45 lambs. For the ewes not driven the average was 1.34 lambs. In this one year's trial there is not much to prove the accuracy of the theory that long drives will cause ewes to breed at an earlier date. Such difference as does exist is in favor of the ewes not driven.

Production of Ewes of Each Group that Produced Lambs that were Marketed.

Complete data were kept on each living lamb. Data were also kept on all ewes throughout the year. The following table will show the production of ewes of each group:

Table 15--Production of ewes of each group that produced lambs that were marketed.

roup	No. of ewes living at market time that had marketed lambs	No. ewes dead at market time that marketed lambs	Av. wt. of living ewes June, 1921	Av. gain of living ewes	No. lambs born	Av. birth wt. of lambs	No. of lambs marketed	No. of lambs per ewe	Total wt. of lambs marketed per ewe
			LBS.			Lbs.			Lbs.
I	19	1	125.5	22.2	32	9.58	26	1.30	88.5
II	21	0	120.8	20.8	28	9.36	25	1.19	80.2
III	21	2	123.3	22.1	37	9.32	32	1.39	112.0
IV	14	1	122.0	24.6	30	9.72	19	1.36	94.0
	75	4					102	1.39	

Most of the ewes made from 20 to 25 pounds gain during the year from August 14, 1920, to May 27, 1921. The average gain made by each group of ewes was practically the same. The average birth weight of Southdown lambs was 9.58 pounds, of Shropshire lambs, 9.72. The average number of lambs dropped per ewe was practically the same for each group.

When most of the lambs were ready for market, the Nashville Stock Yards Company, of Nashville, Tennessee, were requested to send some one to the Experiment Station to grade the lambs. They kindly sent Mr. G. L. Watkins, who has had many years' experience in buying lambs on Louisville, Chicago and Nashville markets. The lambs were graded in three market classes, fancy select, medium, and good. Most of the lambs were marketed May 27. A few of the smaller ones marketed on July 1. Table 16 gives data of all lambs marketed.

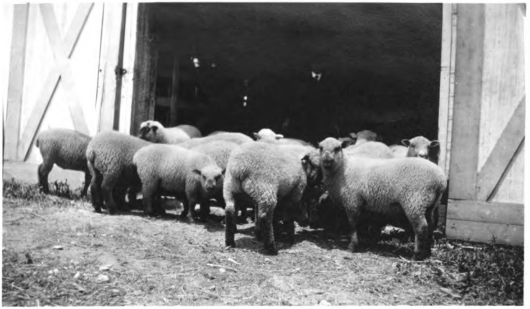


Fig. 3. Southdown Lambs. 1920-21.

Fig. 4. Shropshire Lambs. 1920-21.

36

Table 16--Data on lambs sold May 27, 1921

Lamb No.	Ewe No.	Twin or single	Birth Wt. Lbs.	Date of birth	Days old	Wt. of lamb Lbs.	Wt. of ewe May 26 Lbs.	Gain of ewe Aug. 14 to May 26	Av. daily gain of lamb	Ewe or wether lamb
Group I (Southdown)										
37	11	Twin	7½	Feb. 13	102	75	112	26	.73	Wether
19	2	Single	12	" 7	108	87	151	34	.80	Wether
6	17	Twin	11	" 13	102	81	163	38	.79	Ewe
36	11	Twin	7	" 13	102	78	112	26	.76	Wether
63	18	Twin	7	" 1	114	78	137	30	.68	Ewe
5	17	Twin	11	" 13	102	80	163	38	.79	Ewe
64	5	Single	7½	" 1	114	76	128	29	.66	Wether
71	15	Single	9	" 2	113	70	dead	—	.61	Wether
62	18	Twin	6	" 1	114	80	137	30	.70	Ewe
11	23	Twin	9½	" 7	108	76	155	28	.70	Ewe
12	23	Twin	8½	" 7	108	77	155	28	.71	Wether
66	25	Twin	8½	Jan. 31	115	73	117	9	.63	Wether
67	25	Twin	7	Jan. 31	115	67	117	9	.58	Ewe
Group II (Shropshire)										
34	48	Single	8	Mar. 7	80	77	127	35	.93	Ewe
25	52	Twin	8	" 23	92	67	112	1	.72	Wether
80	43	Single	11	" 12	75	45	115	14	.60	Wether
17	53	Single	11	" 16	99	80	134	39	.80	Ewe
74	37	Single	9	" 15	72	55	110	18	.76	Ewe
42	47	Single	8	" 12	101	84	117	29	.83	Ewe
45	50	Single	10	" 22	95	79	134	29	.85	Ewe
24	52	Twin	8	" 23	92	69	112	1	.75	Ewe
81	41	Twin	9	" 12	75	62	155	32	.82	Ewe
33	56	Single	10	" 7	80	78	125	25	.97	Ewe
38	34	Single	10	" 16	99	80	110	20	.80	Ewe
7	32	Twin	7½	" 21	94	56	113	20	.55	Wether
8	32	Twin	7½	" 21	94	53	113	20	.53	Ewe
75	44	Single	12	" 8	71	77	122	29	1.08	Wether
48	33	Single	11	" 27	90	83	142	34	.92	Wether
39	29	Single	8	" 3	112	85	127	11	.76	Wether
83	31	Single	10	" 7	80	63	92	5	.78	Wether
72	30	Single	10	" 7	80	73	118	6	.91	Wether
53	45	Single	11	" 25	90	82	114	16	.91	Wether
30	55	Twin	9	" 7	80	66	97	7	.82	Wether
31	55	Twin	11	" 7	80	67	97	7	.83	Ewe
Group III (Hampshire)										
14	58	Twin	8	Feb. 20	93	76	121	18	.81	Ewe
49	61	Single	11	" 7	108	90	81	11	.83	Wether
40	74	Single	10½	" 17	98	87	137	27	.80	Ewe
70	67	Single	12	" 5	110	100	120	27	.90	Ewe
3	60	Single	7½	" 18	97	77	145	38	.79	Ewe
43	71	Single	10	" 9	106	102	123	15	.96	Ewe
60	81	Twin	7½	" 3	112	85	126	20	.75	Ewe
28	76	Twin	9	" 5	82	50			.54	Ewe
29	76	Twin	9	" 5	82	57			.62	Ewe
26	77	Twin	7½	" 16	99	80	145	37	.80	Wether
47	63	Single	11½	" 17	98	95	108	15	.95	Ewe

(continued on next page)

Data on lambs sold May 27, 1921 (continued)

Lamb No.	Ewe No.	Twin or single	Birth wt. Lbs.	Date of birth	Days old	Wt. of lamb Lbs.	Wt. of ewe May 26 Lbs.	Gain of ewe Aug.14 to May 26	Av. daily gain of lamb	Ewe or wether lamb
41	62	Single	11	Feb. 16	99	96	138	33	.96	Ewe
59	81	twin	7½	" 3	112	101	126	20	.90	Wether
13	58	Twin	7½	" 20	95	82	121	18	.86	Wether
2	59	Twin	7	" 11	104	55	137	28	.52	Ewe
23	70	Twin	10	" 24	91	73	168	32	.80	Ewe
55	75	Single	12	Jan. 30	116	94	97	1	.81	Wether
27	77	Twin	7½	Feb. 16	99	80	145	37	.80	Wether
68	59%	Twin	7½	Jan. 30	116	85	112	24	.73	Wether
73	64	Single	9	Mar. 16	71	58	94	1	.82	Wether
22	70	Twin	10	Feb. 24	91	78	168	32	.85	Wether
65	80	Single	9½	" 1	114	94	77	23	.82	Wether
52	66	Single	10	" 28	88	84	116	18	.95	Wether
56	83	Twin	8½	" 5	110	73	dead	—	.66	Ewe
57	83	Twin	8	" 5	110	68	dead	—	.61	Wether
1	59	Twin	8	" 11	100	83	137	28	.83	Ewe
46	68	Single	12	" 7	108	99	157	36	.91	Wether
51	73	Twin	11	" 11	100	77	134	26	.77	Ewe
50	73	Twin	10	" 11	100	87	134	26	.87	Wether

*This ewe, No. 76, is a wild ewe, and was not found with the flock at the time of the collection of the above data on the lambs. She was on hand at the time that the sheep were shorn May 19.

% One of the twins of this ewe was killed by a mule Feb. 4.

Group IV (Oxford Down)

58	97	Single	12½	Jan. 21	125	94	94	33	.75	Wether
21	90	Single	12	Feb. 18	97	90	106	28	.92	Wether
44	108	Single	12	" 22	93	85	92	5	.89	Ewe
15	92	Twin	8	" 21	94	80	112	29	.85	Wether
35	98	Single	10	" 18	97	78	105	21	.70	Ewe
78	93	Twin	11	Mar. 12	75	72	122	32	.96	Wether
4	102	Single	12	Feb. 6	109	86	132	22	.78	Wether
20	100	Single	12	Feb. 8	107	102	143	41	.95	Ewe
18	88	Single	12	Mar. 9	78	73	139	44	.93	Wether
76	89	Twin	10	" 9	78	74	154	22	.93	Wether
54	103	Single	10	" 1	86	82	82	5	.95	Ewe
9	91	Twin	8	" 9	78	69	129	43	.88	Wether
61	99	Single	11	Feb. 19	94	75	135		.79	Wether
77	89	Twin	10	Mar. 9	78	68	154	22	.87	Wether
79	93	Twin	11	" 12	75	68	122	32	.90	Wether
10	91	Twin	9	" 9	78	74	149	43	.94	Wether

Table 17--Data on lambs sold July, 1921

(Since the rams were changed with reference to groups, the ewes put in these groups at this time will be according to the breed of the sire of the lambs).

Lamb No.	Ewe No.	Twin or Single	Birth wt. Lbs.	Date of birth	Days old	Wt. of lamb	Wt. of ewe July 1 Lbs.	Gain of ewe Aug.14 to July 1	Av. daily gain of lamb Lbs.	Ewe or wether lamb
				Group I (sired by Southdown ram)						
111	57	Twin	9	May 15	47	53	147	45	1.13	Wether
109	69	Single	11	May 12	50	45	112	13	.90	Ewe
112	78	Single	10½	Apr.27	65	50	75	4	.77	Wether
				Group II (sired by Shropshire ram)						
114	109	Single	9	May 6	56	46	115	32	.82	Wether
101	106	Single	7	Apr.20	72	51	112	10	.70	Wether
88	49	Triplet	11	" 8	84	51	147	24	.60	Ewe
86	49	Triplet	8	" 8	84	56	147	24	.60	Wether
				Group III (sired by Hampshire ram)						
89	6	Twin	9	Apr. 8	84	66	129	24	.78	Ewe
90	6	Twin	9	" 8	84	53	129	24	.63	Ewe
92	28	Single	12	" 12	80	74	112	5	.92	Ewe
96	22	Single	12	" 13	79	72	143	19	.91	Ewe
93	12	Single	12½	" 12	80	68	117	20	.85	Ewe
95	27	Single	11	" 8	84	66	95	15	.78	Ewe
104	1	Single	10	" 13	79	53	120	31	.67	Ewe
94	9	Single	12	" 12	80	56	115	14	.70	Wether
115	20	Twin	11	" 23	69	52	108	1	.75	Ewe
110	20	Twin	10	" 23	69	49	108	1	.71	Ewe
91	26	Single	10	" 8	84	60	151	33	.71	Wether
85	10	Twin	11	" 7	85	57	93	3	.67	Ewe
105	21	Twin	11	" 20	72	60	140	36	.83	Ewe
				Group IV (sired by Oxford ram)						
117	40	Twin	8	May 19	43	34	163	30	.79	Ewe
116	40	Twin	9	May 19	43	33	163	30	.77	Ewe
102	101	Single	12	Apr.13	79	73	117	19	.99	Wether

Market grades of Lambs of Each Breed

In grading the lambs into three groups, fancy select, medium, and good, Mr. Watkins made the statement that the lines of demarcation between the groups as he has made them were very slight. It was his opinion that the lambs in the lower grades were younger lambs and would have graded fancy select had they been given a few more days in which to mature. The grading of the lambs for each breed were according to Table 18.

Fig. 5. Hampshire Lambs. 1920-21.

Fig. 6. Oxford Lambs. 1920-21.

Table 18--Market grade of lambs of each breed.

Group	Total lambs sold	No. grading fancy selects	Av. age in days fancy select	No. grading medium	Av. age in days medium	No. grading good	Av. age in days good	Per cent of each group grading fancy select
Southdown	26	18	100	4	83	4	67	69
Shropshire	25	16	89	5	86	4	67	64
Hampshire	31	20	103	6	87	5	94	64
Oxford	19	9	96	3	77	7	74	47
TOTAL:	101	63		18		20		
	Average:		97		84		81	

Of the 101 lambs marketed 63 graded as fancy select, 18 as medium, and 20 as good. It was noticed from the table that the data compiled after the lambs were marketed verifies Mr. Watkins' statement regarding the age of the two lower grades. The average age of the lambs grading as fancy select was 97 days, of those grading as medium, 84 days and of those grading as good or below, 81 days. The per cent of each group grading as fancy select was as follows: Southdown 69, Shropshire 64, Hampshire 64, and Oxford 47.

Gains made by Lambs Marketed of Each Breed.

The influence of the breed of the sire on gains of lambs produced from common ewes seemed to be directly proportionate to the size of the breed of the ram used in each case. Table 19 is given to show gains made by lambs sired by rams of each of the following breeds: Southdown, Shropshire, Hampshire, and Oxford.

Table 19--Gains made by lambs marketed of each breed.

Group	Total lambs	Av. age of each lamb days	No. twin lambs	No. single lambs	Av. Daily gain each lamb Lbs.	Av. daily gain of lamb per ewe Lbs.	Av. wt. of lambs each breed	Av. total wt. of lambs per ewe Lbs.
I Southdown	26	92.2	14	12	.74	.967	68.1	89.16
II Shropshire	25	85.1	9	16	.79	.982	67.4	83.57
III Hampshire	32	97.4	20	12	.82	1.148	78.9	111.81
IV Oxford	19	84.6	9	10	.87	1.181	74.2	99.91

The average daily gains made by the lambs sired by the rams of the respective breeds were as follows: Southdown 74 pound; Shropshire .79 pound; Hampshire .82 pound; and Oxford .87 pound. The average weights of lambs of the various breeds at the time of marketing were as follows: Southdown 68.1 pounds, Shropshire lambs 67.4 pounds, Hampshire lambs 78.9 pounds, and Oxford 74.2 pounds. The Southdown and Hampshire lambs averaged a few days older than the Shropshire and Oxford lambs. The Southdown lambs were slightly larger than the Shropshire lambs, and the Hampshire lambs slightly larger than the Oxford lambs. The differences could be accounted for partly by differences in age. The Southdown and Hampshire lambs were practically of the same age as were also the Shropshire and Oxford lambs, and may therefore be compared on that basis. The Hampshire lambs were 10.8 pounds larger than the Southdown lambs, and the Oxford lambs were 6.8 pounds larger than the Shropshire lambs. The percentage of lambs of each of the first three groups, namely, Southdown, Shropshire, and Hampshire, that graded as fancy select were practically the same, and sold at a price of 12¼ cents per pound for lambs marketed. The Southdown lambs averaged $8.34 each, the Shropshire lambs $8.45, the Hampshire lambs $9.56.

Table 20--Gains by sex of lambs marketed.

	Total No. lambs	Total No. wether lambs	Total No. ewe lambs	Av. daily gain wether lambs Lbs.	Av. daily gain ewe lambs Lbs.
Group I Southdown	26	11	15	.73	.75
" II Shropshire	25	13	12	.79	.79
" III Hampshire	32	14	18	.82	.79
" IV Oxford	19	13	6	.87	.88
Totals	102	51	51		
			Averages	.80	.79

The average gain made by lambs in each group were practically the same for the two sexes. The average gain of all wether lambs was .80 pound, and of all ewe lambs .79 pound. The average daily gain of all lambs was .795 pound.

PART II. 1921-22.

The plan for the experiment during this year was the same as for the previous year except that one more group was added to the experiment, which group was headed by scrub rams. The total number of ewes was increased to 159 head. There were 60 ewes with unbroken mouths and that had good lambing records which were held over from the previous year. These were added to by purchases of common ewes. On July 11 there were purchased 23 common white-faced ewes averaging 97.5 pounds at $4.00 each and on July 16 there were purchased 76 head averaging 96.5 at $4.75 each. On August 6, 1921 the ewe flock was divided into 5 flocks as nearly equal as possible with regard to black, mottled, gray, buff and white faces, with regard to ages, and also so divided that the ewes used the previous year were divided among the five flocks. All ewes not bearing labels were given aluminum ear tags and descriptions and weights taken as of the previous year. The ewes carried over from the previous year are described in these notes as "old ewes", meaning that they were used the previous year.

On August 8, 1921 the descriptions, weighings, and division into flocks had been completed. Each flock was then divided and one-half of each turned into a common flock and were sent on a 17 mile drive. They were started at 7:30 A. M. and returned to the barn at 4 P. M. They were then sent to their respective flocks. Each flock was kept in a small

enclosure in the barn for the night and the rams turned for the first time with their respective flocks. The following are the ewes that were sent on the drive.

Group I		Group II		Group III		Group IV		Group V	
New ewes	Old ewes	New ewes	Old ewes	New ewes	Old ewes	New ewes	Old ewes	New ewes	Old ewes
151	21	171	1	193	6	211	2	231	40
152	57	172	11	194	7	212	8	232	44
154	71	173	13	195	50	213	10	236	79
156	74	174	52	200	97	214	18	237	86
157	118	175	80	201	104	215	34	239	253
158		177		202	251	219	53	241	
159		184		204		222	70	242	
162		185		207		225		246	
163		188		208		227		346	
165		189		209		229			

Throughout the fall, winter and spring the flocks were handled as they were the previous year. During the breeding season the flocks were changed or rotated on pasture every two weeks. On December 1 all rams were taken out and all the flocks turned into one common flock and pastured throughout the winter on crimson clover and rye. Each ewe was in the open throughout the whole winter and spring without hay or grain except for about a week for each ewe at lambing time when, in order to give proper attention, they were kept under an open shed. They were salted and counted twice each week.

Lambs were weighed at birth and given an aluminum ear tag. Also sex and time of day was noted.

Breeds of Rams Used 1921-22

The same breeds were used as for the previous year except that a scrub ram group was added. Group I was headed with two yearling Southdown rams purchased of a reputable breeder.

Fig. 7. Ewes and Lambs on Crimson Clover in March, 1922.

Fig. 8. Ewes and Lambs on Crimson Clover in March, 1922

Only one ram was with the flock at a time. These two rams were rotated with the flock every two weeks. Group II was headed with the Shropshire ram purchased and used after October 28, 1920 in the previous year's work. Group III was headed by the Hampshire ram that was used the previous year. Group IV was headed by a three-year-old Oxford ram purchased of a reputable Ohio breeder. Group V was headed by three-year-old scrub rams purchased locally. They were strong, vigorous scrub rams, but showed no particular breed characteristics. They were rotated with their flock as described for Group I.

Description of Ewes

Tables 1, 2, 3, 4 and 5 give weights and descriptions of individual ewes as taken August 6, 1921. A column was added which gives weights of fleeces on May 3, 1922.

Group I.

Description of Ewes August 6, 1931.

Aluminum ear tag	Age	Condition	Weight	Color	Remarks	Weight of Fleece May 5, 1932
151	2	Fair	115	White	Horns	5
152	8	Good	135	White		3
154	8	Fair	129	Buff	Bare belly	4½
156	1	Thin	75	Mottled		3
157	2	Thin	90	White	1/2 Bare belly	5
158	8	Very thin	85	White	Very bare belly	2
159	6	Good	146	Black	Bare belly	4½
162	5	Good	117	Dark Brow	3/4 Bare belly	4½
163	3	Thin	75	White	Bare belly	2½
165	5	Fair	95	White	1/2 Bare belly	4
153	2	Fair	100	Buff	Bare belly	4½
155	8	Fair	131	White	1/2 Bare belly	6
160	7	Thin	92	Gray	1/2 Bare belly	4
161	5	Thin	81	White	1/2 Bare belly	3
164	7	Good	105	Yellow	Very bare belly	4
166	8	Fair	111	White	Very bare belly	5
167	2	Good	100	Mottled	Bare belly	4½
168	7	Good	109	White	--	4
169	1	Thin	77	Black	--	6½
170	2	Thin	82	Black	--	4

Description of old ewes, same group

Old No.	New No.	Age	Condition	Weight	Color	Remarks	
21	--	4	Good	138	Black	1/2 Bare belly	dead
37	--	3	Very Good	148	Black	--	9
71	--	6	Good	136	White	Bare belly	dead
74	--	6	Very Good	146	White	Bare belly	5½
91	118	7	Very Good	155	Black	Bare belly	6
33	--	5	Very Good	150	White	--	6
41	--	3	Very Good	151	Black	Bare belly	3
56	--	3	Good	133	White	Bare belly	2½
60	--	6	Good	145	Black	Very bare belly	dead
68	--	7	Very Good	163	Black	Bare belly	5
75	--	7	Fair	94	White	1/4 Bare belly	7
81	--	3	Very Good	128	Black	Bare belly	4½

Group 3.

Description of Ewes August 6, 1921.

Aluminum ear tag	Age	Condition	Weight	Color	Remarks	Weight of Fleece May 3, 1922
171	5	Good	108	White	--	4
172	6	Very thin	86	White	Bare belly	3½
173	1	Thin	75	Mottled	--	5½
174	7	Very thin	71	White	Bare belly	4
175	4	Thin	89	White	---	6
177	8	Thin	91	White	--	5
184	2	Fair	88	White	3/4 Bare belly	3½
185	5	Fair	98	White	3/4 Bare belly	4
188	7	Thin	96	Mottled	--	8
189	1	Fair	74	Dark Brown	--	5
176	4	Fair	94	White	Horns	4
178	5	Fair	99	Mottled	3/4 Bare belly	dead
179	3	Fair	95	Black	--	4
180	4	Fair	99	Yellow	Bare belly	4
181	8	Fair	97	White	Very bare belly	5
182	1	Fair	72	Brown	--	4½
183	8	Thin	104	Light Y-	1/2 Bare belly	4
186	6	Fair	105	Light M-	--	4½
187	6	Good	120	Black	1/2 Bare belly	6½
190	7	Thin	93	Yellow	Bare belly	2½

Description of old ewes, same group.

Old No.	New No.	Age	Condition	Weight	Color	Remarks	
1	--	7	Fair	110	Black	--	4
11	--	5	Very Good	124	White	--	7
13	--	7	Good	125	White	Bare belly	dead
49	--	4	Good	148	Black	1/2 Bare belly	6
52	--	5	Good	115	White	3/4 Bare belly	2½
80	--	6	Fair	76	White	1/2 Bare belly	4
16	--	3	Good	133	White	--	dead
20	--	6	Fair	110	Black	Bare belly	4
23	--	5	Very Good	153	Black	1/2 Bare belly	5
45	--	4	Very Good	123	Mottled	3/4 Bare belly	4
67	--	5	Very Good	121	Black	Bare belly	3
100	--	4	Very Good	147	Mottled	Bare belly	6

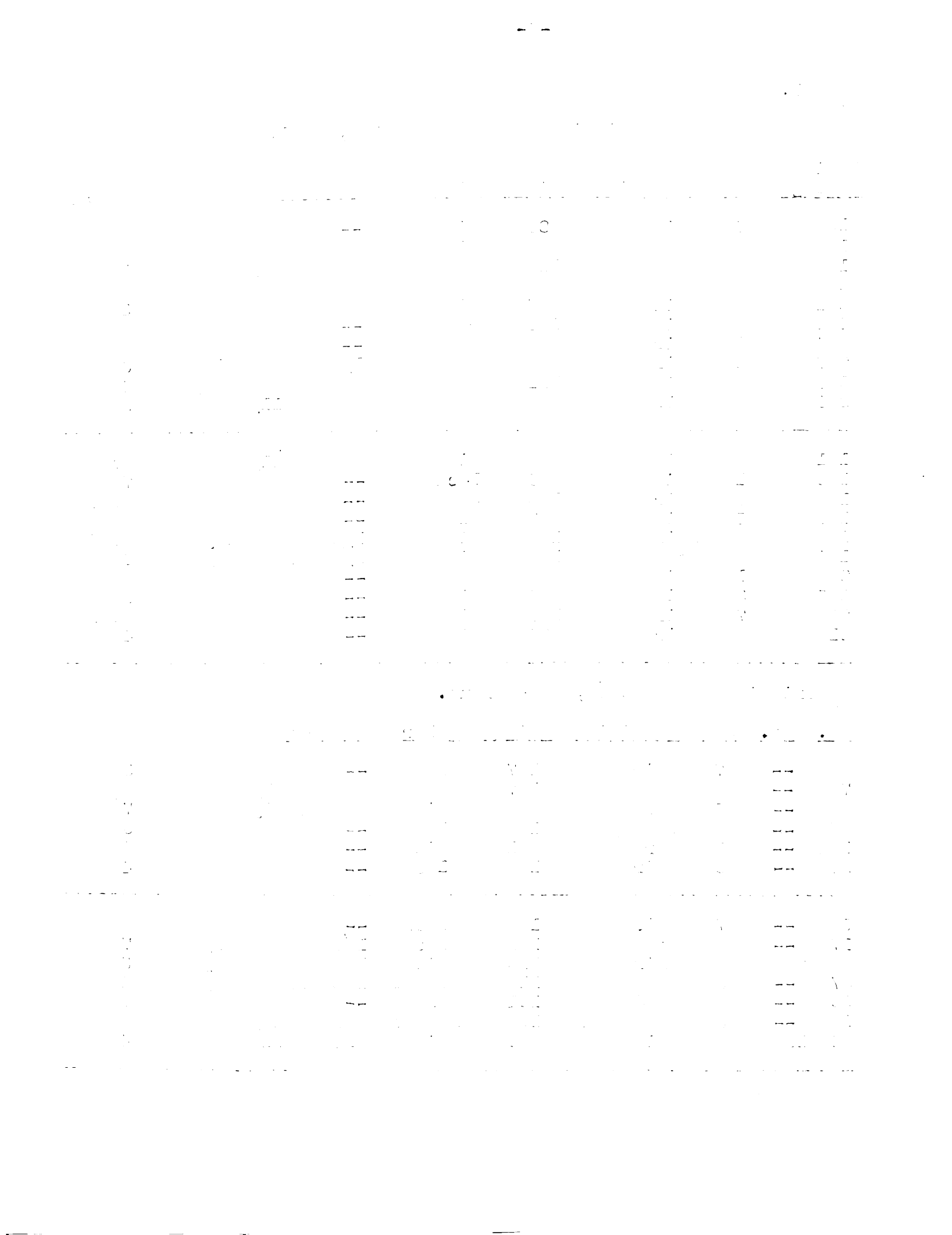
Group 3.

Description of Ewes August 6, 1921.

Aluminum ear tag	Age	Condition	Weight	Color	Remarks	Weight of Fleece May 3, 1922
193	4	Thin	89	White	--	6
194	8	Good	139	White	Bare belly	5
195	6	Fair	110	White	Bare belly	3
200	8	Good	110	White	Bare belly	5
201	8	Thin	87	White	Bare belly	3
202	6	Thin	116	Brown	--	6
204	1	Fair	89	Mottled	--	5
207	2	Fair	83	Black	1/2 Bare belly	6
208	8	Thin	111	White	Very bare belly	4
209	5	Fair	90	White	Bare belly	3
191	5	Fair	89	White	Bare belly	dead
192	1	Fair	95	Black	--	7
196	4	Fair	102	Mottled	--	dead
197	5	Thin	83	Yellow	--	2½
198	6	Fair	108	White	1/2 Bare belly	dead
199	8	Good	114	White	1/2 Bare belly	6
203	1	Fair	76	Mottled	--	6
205	3	Thin	95	White	--	8
206	7	Fair	103	White	--	dead
210	8	Fair	94	White	--	4

Description of old ewes, same group.

Old No.	New No.	Age	Condition	Weight	Color	Remarks	
6	--	7	Fair	127	Black	--	3
7	--	6	Good	127	White	Bare belly	5
50	--	5	Very Good	124	White	Bare belly	7½
97	**	6	Very Good	146	Black	--	6
104	--	3	Very Good	141	White	--	4½
28	--	8	Fair	130	Black	--	4
9	--	7	Fair	120	Black	--	
17	--	3	Good	165	Black	1/4 Bare belly	7
30	250	5	Fair	112	White	1/2 Bare belly	3
37	--	3	Good	115	Mottled	1/2 Bare belly	4
92	--	5	Good	121	Black	--	6
109	--	3	Very Good	123	Mottled	Bare belly	4½
55	116	5	Thin	92	White	Bare belly	4



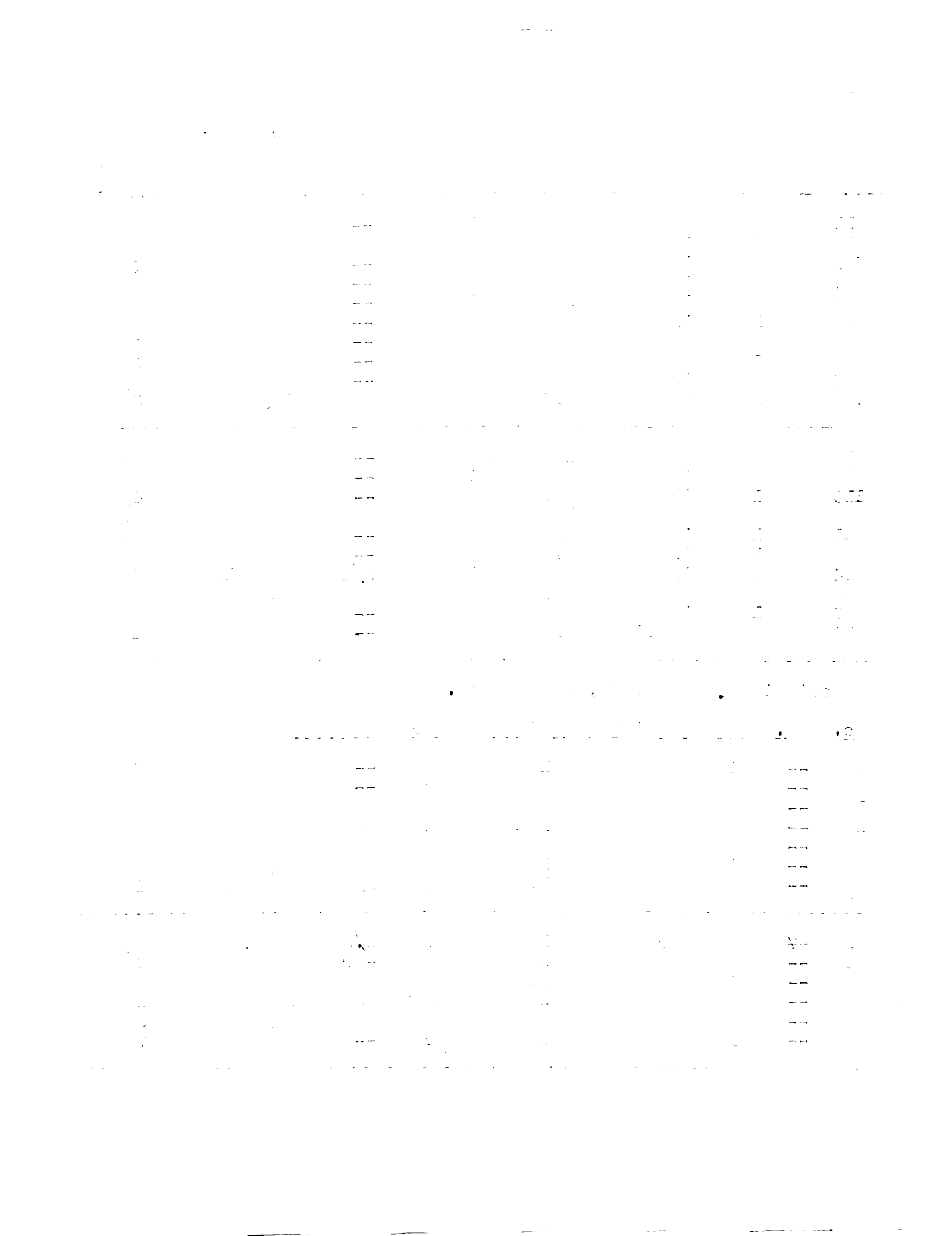
Group 4

Description of Ewes August 6, 1921.

Aluminum ear tag	Age	Condition	Weight	Color	Remarks	Weight of Fleece May 3, 1922
211	8	Very good	162	White	--	4½
212	1	Thin	75	Black	Bare belly	6
213	4	Fair	71	White	--	3
214	8	Fair	105	White	--	5
215	8	Thin	103	White	--	6
219	1	Fair	94	White	--	6½
222	4	Good	129	Mottled	--	7
225	5	Good	115	White	--	3½
227	4	Fair	124	Black	--	6½
229	8	Thin	85	White	Bare belly	3
216	4	Good	102	Brown	--	dead
217	8	Thin	105	White	--	6
218	1	Fair	77	Mottled	--	4½
220	8	Good	100	White	Bare belly	dead
221	1	Thin	82	White	--	6½
223	1	Fair	73	White	--	dead
224	2	Fair	85	White	1/4 Bare belly	4
226	6	Good	123	Black	Bare belly	5
228	1	Thin	68	Black	--	5
230	8	Very thin	96	Mottled	--	4

Description of old ewes, same group.

Old No.	New No.	Age	Condition	Weight	Color	Remarks	
2	--	4	Good	143	White	--	6
29	--	5	Very good	144	Black	--	dead
10	--	6	Good	96	White	Fair	3
18	--	6	Very good	143	Black	1/2 Bare belly	5
34	--	5	Very good	117	White	Bare belly	4
53	--	4	Very good	133	White	Bare belly	3
70	--	6	Very good	170	Dark	1/4 Bare belly	4
91	--	6	Very good	146	Black	1/2 Bare belly	5½
66	--	5	Good	118	White	Very bare belly	2
69	--	4	Fair	115	Yellow	Bare belly	5
89	--	5	Very good	156	Dark	Bare belly	1
90	--	3	Good	115	White	Bare belly	3
93	--	6	Very good	133	Black	--	7



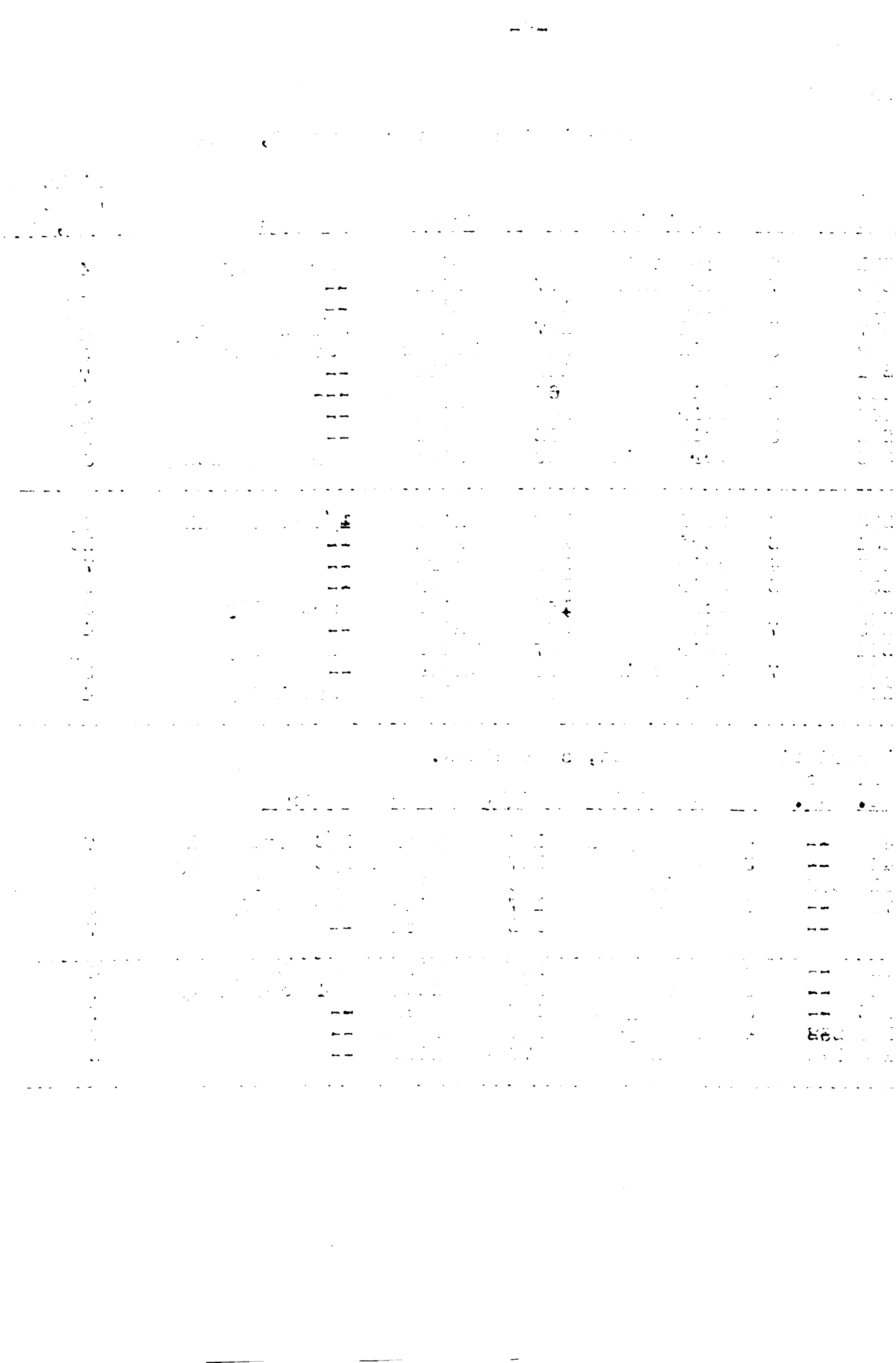
Group 5

Description of Ewes August 6, 1921

Aluminum ear tag	Age	Condition	Weight	Color	Remarks	Weight of Fleece May 3, 1922
231	2	Very thin	76	White	Bare belly	4
232	7	Very thin	77	White	--	5½
236	5	Good	110	White	--	dead
237	3	Good	137	White	3/4 Bare belly	4
239	8	Thin	109	Yellow	Bare belly	3
241	6	Good	111	White	--	7
242	1	Thin	80	Mottled	---	5½
246	8	Fair	108	White	--	4½
248	3	Thin	92	White	--	5
346	8	Very thin	89	White	Very bare belly	3
233	6	Good	110	White	1/2 Bare belly	5½
234	2	Good	120	Black	--	12
235	4	Fair	101	Buff	--	7
238	2	Fair	100	Black	--	6
240	6	Good	136	White	Bare belly	5
243	7	Good	92	White	--	4
244	6	Fair	97	White	Bare belly	5½
245	7	Very thin	75	White	--	3
249	8	Thin	88	White	Bare belly	4

Description of old ewes, same class.

Old No.	New No.	Age	Condition	Weight	Color	Remarks	
40	--	6	Very good	164	Black	1/2 Bare belly	7
44	--	3	Good	127	Mottled	1/2 Bare belly	4
61	253	6	Thin	85	White	Bare belly	4
79	--	6	Good	107	White	Bare belly	3
88	--	6	Very good	132	Black	--	7
48	--	6	Good	123	White	Bare belly	4
62	--	6	Very good	143	Black	1/4 Bare belly	7
102	--	3	Very good	147	Black	--	7½
106	252	4	Very good	119	Yellow	--	7
103	112	6	Thin	77	White	--	2



57

In order to test the fairness of the division, table 6 has been prepared as a summary of tables 1, 2, 3, 4 and 5.

Table 6

Summary of Description of Ewes, August 6, 1921.

	Group I	Group II	Group III	Group IV	Group V
Av. wt. new sheep lbs.	102	93	99	99	99
Av. wt. old sheep lbs.	139	123	125	133	122
Av. wt. each group lbs.	116	104	109	112	107
Av. age yrs.	4.89	4.96	5.15	4.74	5.20
Black, brown or mottled faces	13	14	14	14	8
Light colored faces	19	18	19	19	21
Long tails	19	13	16	15	15
Bare bellies	23	19	18	13	13
Condition thin	8	8	7	7	9
" fair	7	12	15	8	4
" good	17	12	11	18	18
Av. wt. fleece ewes living May 3, 1922	4.6	4.6	4.9	4.6	5.2

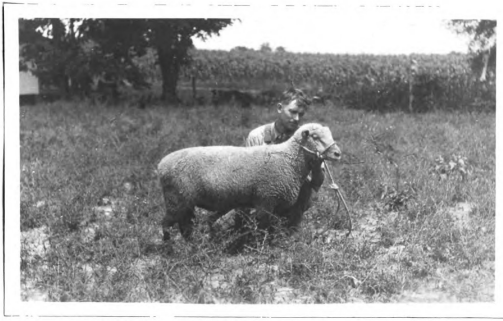


Fig. 9. Southdown Ram Used, 1921-22.

Fig. 10. Shropshire Ram Used, 1921-22.

Management of Ewes During Lambing Season

The ewes and lambs were managed as they were the previous year except eachewe was put in shed for a week at lambing time. Lambs were weighed at birth, sex noted, and each lamb labelled. Table 7 gives the data collected.

60

Table 7. Data on Birth of Lambs

Group I. Ewes, Southdown Ram.

New ewes sent on drive	Condition of ewes in Aug.	Age of ewe	White or colored face	Date of lambing	No. of lambs	Sex of lambs	Birth Weight
151	Fair	2	W	Jan. 22	2	E E	9.5 8.75
152	Good	8	W	Jan. 25	2	R R	8.25 8.75
154	Fair	8	W	Jan. 23	2	E E	6.75 8.0
156	Thin	1	C	Feb. 25	1	R	9.25
157	Thin	2	W	Jan. 17	1	R	10.25
158	Thin	8	W	Feb. 26	2	E E	7.0 6.0
159	Good	6	C	Feb. 23	2	E E	6.75 7.0
162	Good	5	C	Feb. 26	1	R	11.0
163	Thin	3	W	Mar. 6	1	E	9.25
165	Fair	5	W	--	No lamb		
New ewes not driven							
153	Fair	2	W	--	No lamb		
155	Fair	8	W	Jan. 17	2	R E	9.0 9.0
160	Thin	7	W	Jan. 24	2	R E	7.25 8.0
161	Thin	5	W	--	No lamb		
164	Good	7	W	Jan. 23	1	E	8.75
166	Fair	8	W	Jan. 23	1	E	10.25
167	Good	2	C	Feb. 29	1	E	8.25
168	Good	7	W	Jan. 26	2	E R	9.25 7.25
169	Thin	1	C	--	No lamb		
170	Thin	2	C	Feb. 20	1	E	10.0

e

Table 7 Continued.

Group I. Continued.

Old ewes sent on drive					
21	Good	4	C	Jan. 28	1------- E--------21.0
57	Good	3	C	--	No lamb
71	Good	6	W	--	ewe died
74	Good	6	W	Mar. 1	1------- E--------10.75
54	Good	7	C	Feb. 10	2-------{E-------- 9.75 {E-------- 9.75
Old ewes not driven					
33	Good	5	W	--	No lamb
41	Good	3	C	Jan. 20	1------- E--------11.0
56	Good	3	W	Jan. 18	1------- R--------11.25
60	Good	6	C	Jan. 6	1------- R--------12.0
68	Good	7	C	Feb. 17	2-------{R-------- 8.25 {E-------- 8.75
75	Fair	7	W	Feb. 20	1------- R--------11.25
81	Good	3	C	Jan. 24	2-------{E-------- 9.0 {R--------10.5

62

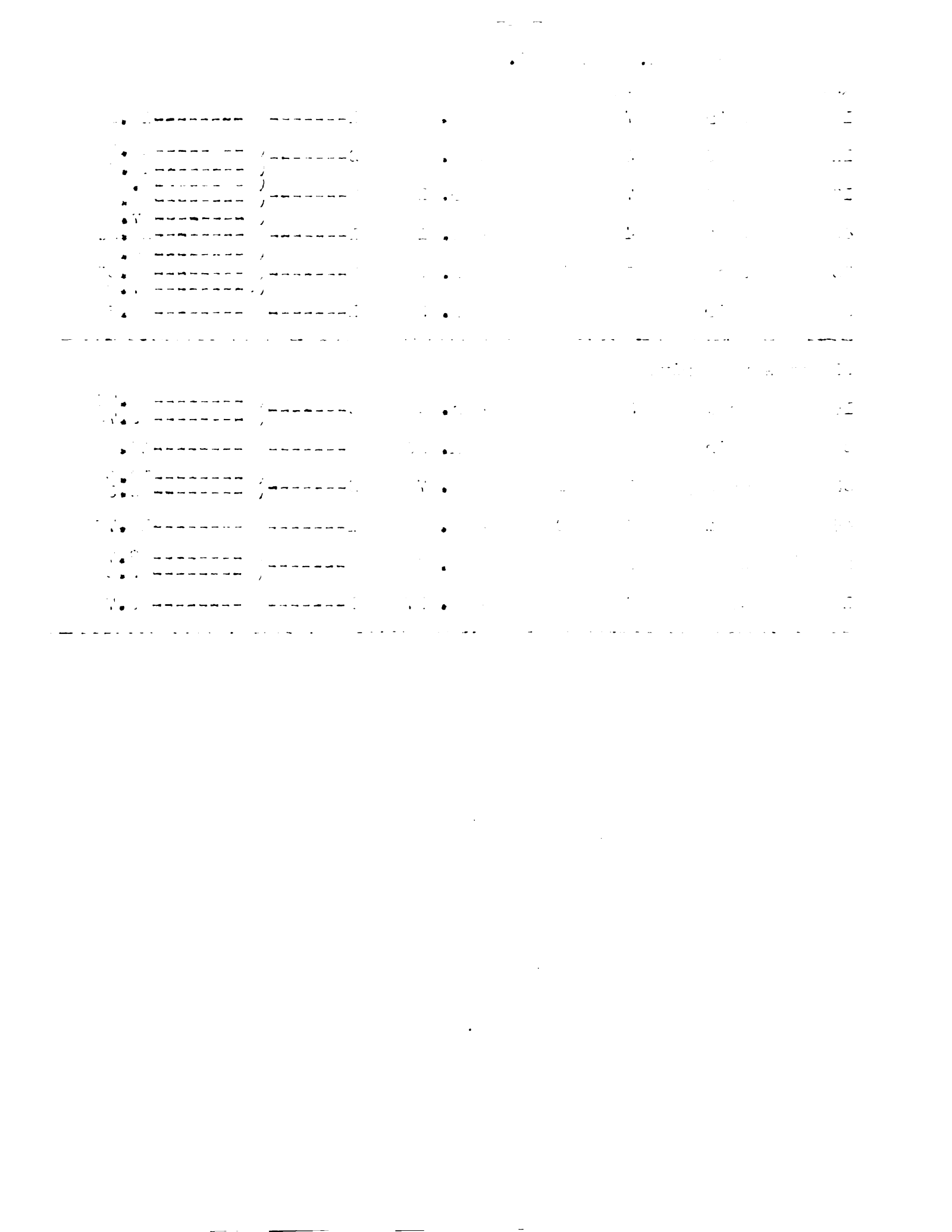
Group II. Ewes, Shropshire Ram.

New ewes sent on drive	Condition of ewes in Aug.	Age of ewe	White or colored face	Date of lambing	No. of lambs	Sex of lambs	Birth Weight
171	Good	5	W	Jan. 5	2	(E (E	9.0 10.5
172	Thin	6	W	Jan. 23	2	(E (R	9.75 10.25
173	Thin	1	C	Mar. 5	1	E	8.0
174	Thin	7	W	Feb. 15	1	R	10.75
175	Thin	4	W	Feb. 10	1	R	7.5
177	Thin	8	W	Mar. 2	2	(R (E	8.5 7.5
184	Fair	2	W	Jan. 23	2	(E (E	7.0 7.5
185	Fair	5	W	Jan. 24	2	(E (E	8.0 8.0
188	Thin	7	C	Feb. 7	1	E	6.0
189	Fair	1	C	Feb. 24	2	(R (E	7.5 7.25
New ewes not driven							
176	Fair	4	W	Jan. 22	1	E	8.75
178	Fair	5	C	Jan. 21	2	(R (E	10.75 9.25
179	Fair	3	C	Mar. 15	2	(R (R	8.0 8.0
180	Fair	4	W	Mar. 1	2	(E (E	7.0 6.75
181	Fair	8	W	Feb. 7	1	E	10.25
182	Fair	1	C	Mar. 24	1	E	9.0
183	Thin	8	W	Jan. 24	3	(R (R (R	7.5 7.0 7.5
186	Fair	6	W	Jan. 19	1	E	8.0
187	Good	6	C	Jan. 24	1	E	9.25
190	Thin	7	W	Jan. 25	2	(R (R	8.0 6.0

63

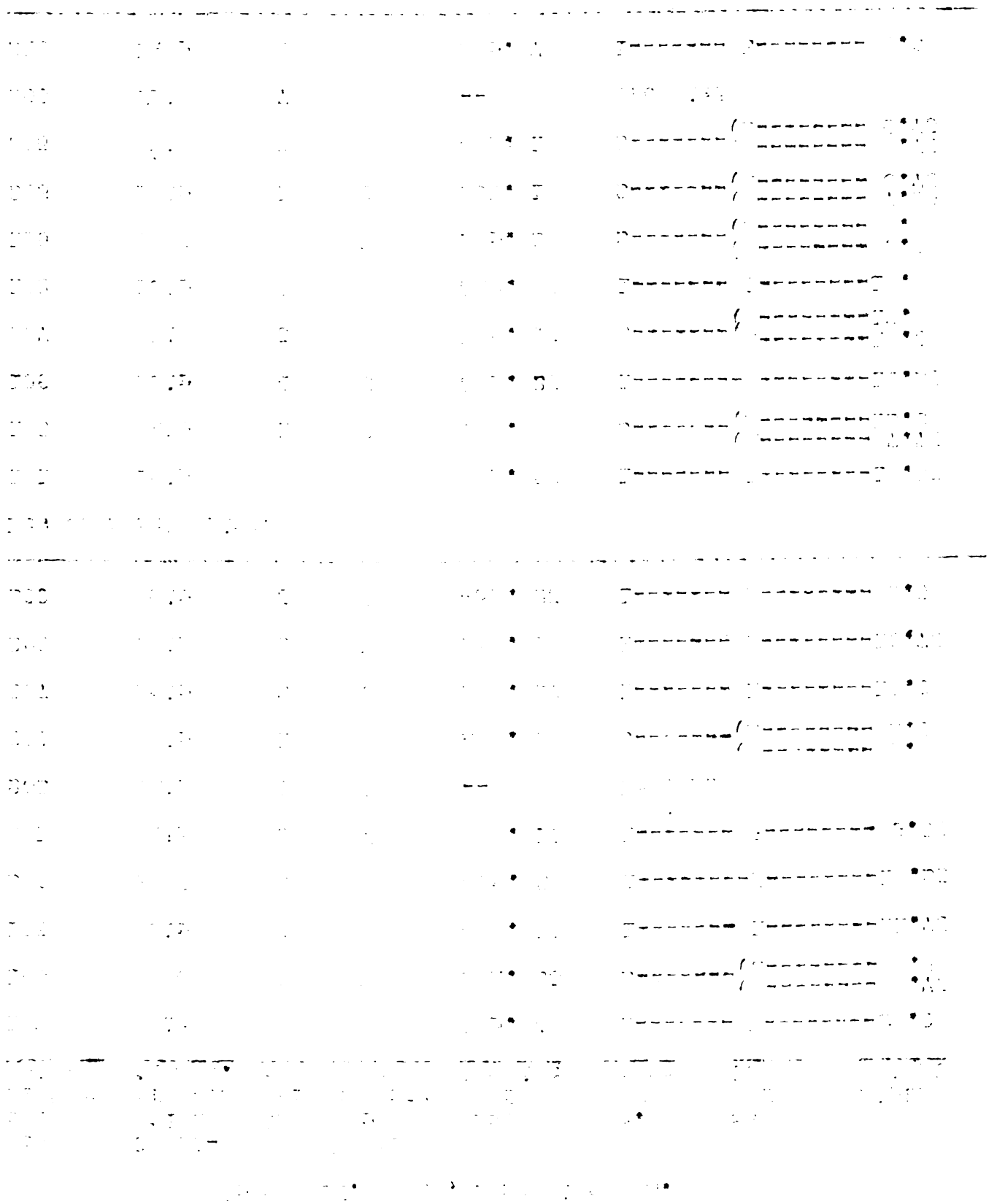
Group II. Continued.

Old ewes sent on drive					
1	Fair	7	C	Feb. 12	1------- E--------10.25
11	Good	5	W	Jan. 13	2-------(E--------10.5 (E--------10.0
13	Good	7	W	Mar. 16	3-------(R--------8.0 (E--------8.0 (E--------7.0
49	Good	4	C	Jan. 19	1------- R--------10.25
52	Good	5	W	Jan. 20	3-------(E--------6.0 (E--------5.25 (E--------7.0
80	Fair	6	W	Jan. 9	1------- R--------9.5
Old ewes not driven					
16	Good	3	W	Jan. 23	2-------(E--------9.75 (R--------9.75
20	Fair	6	C	Jan. 29	1------- E--------10.5
23	Good	5	C	Jan. 7	2-------(R--------10.0 (E--------8.5
45	Good	4	C	Jan. 26	1------- R--------10.75
67	Good	5	C	Jan. 4	2-------(E--------8.75 (R--------9.25
100	Good	4	C	Jan. 17	1------- E--------9.75



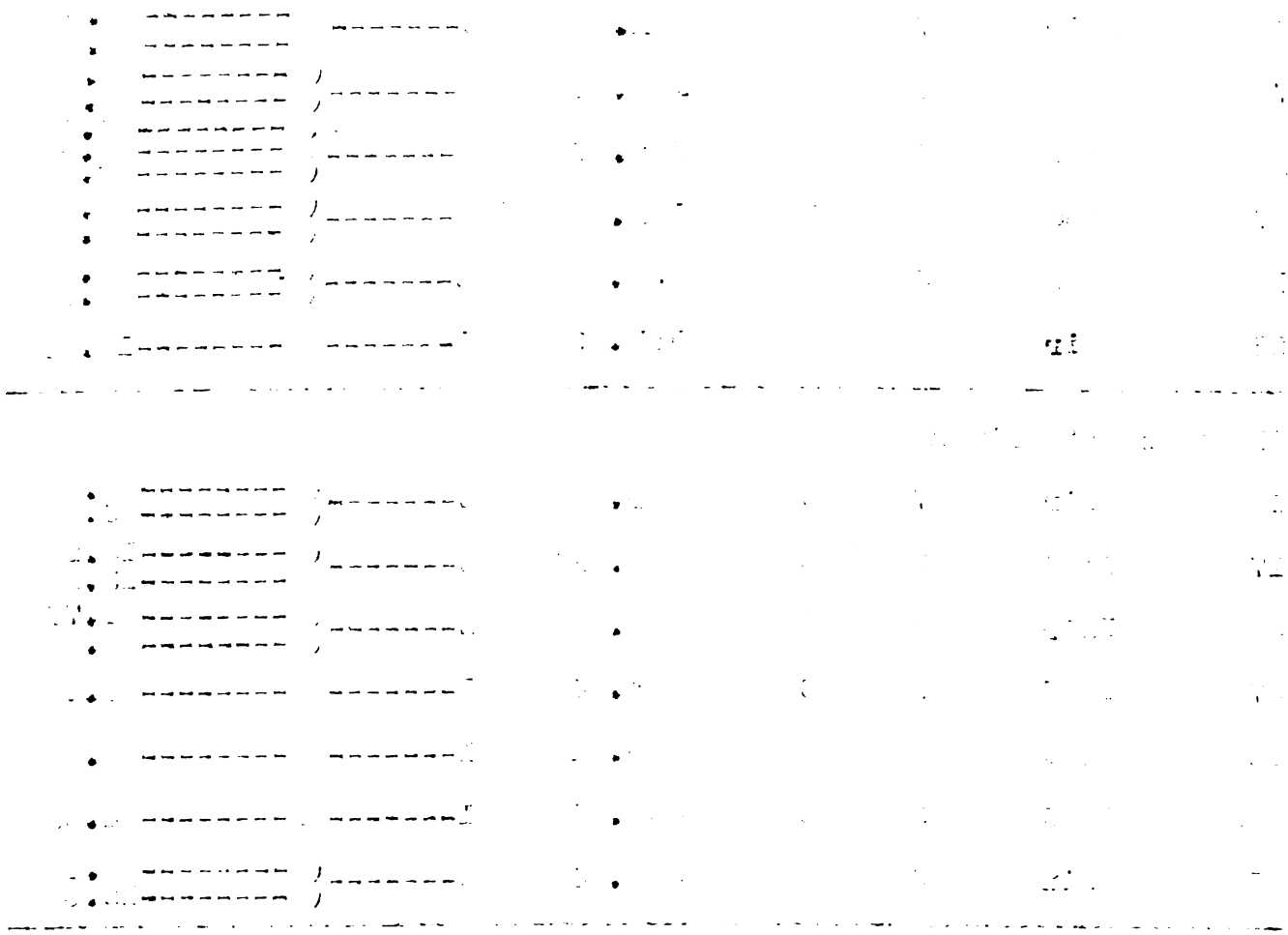
Group III. Ewes, Hampshire Ram.

New ewes sent on drive	Condition of ewes in Aug.	Age of ewe	White or colored face	Date of lambing	No. of lambs	Sex of lambs	Birth Weight
193	Thin	4	W	Apr. 4	1	E	10.0
194	Good	8	W-	Jan. 28	2	E E	8.75 9.5
195	Fair	6	W	Jan. 17	1	R	11.75
200	Good	8	W	Jan. 24	1	R	10.25
201	Thin	8	W	Jan. 19	1	R	9.25
202	Thin	6	C	--	No lamb		
204	Fair	1	C	Apr. 1	2	E E	8.0 8.0
207	Fair	2	C	Mar. 17	1	R	10.0
208	Thin	8	W	Feb. 8	1	E	10.75
209	Fair	5	W	Jan. 23	1	R	8.5
New ewes not driven							
191	Fair	5	W	Jan. 25	1	R	12.25
192	Fair	1	C	Jan. 27	2	R E	7.75 12.0
196	Fair	4	C	Jan. 25	1	E	10.25
197	Thin	5	W	Mar. 15	2	R R	10.0 13.0
198	Fair	6	W	Jan. 28	1	E	10.0
199	Good	8	W	Mar. 23	2	E E	9.0 8.0
203	Fair	1	C	Feb. 16	2	E R	7.25 6.75
205	Thin	3	W	Jan. 15	2	R E	6.75 6.75
206	Fair	7	W	--	ewe died		
210	Fair	8	W	Mar. 7	1	E	8.0



Group III. Continued.

Old ewes sent on drive					
6	Fair	7	C	Jan. 28	2------- R--------10.0 R-------- 9.0
7	Good	6	W	Jan. 23	3------- R-------- 9.0 R-------- 8.0
50	Good	5	W	Jan. 7	2------- R-------- 9.0 R--------10.0 R-------- 9.5
97	Good	6	C	Jan. 29	2------- R-------- 9.25 R-------- 8.5
104	Good	3	W	Feb. 5	2------- R--------10.0 R-------- 9.5
28	Fair	8	C	Feb. 9	1------- R--------15.25
Old ewes not driven					
9	Fair	7	C	Mar. 16	2------- R-------- 8.0 R-------- 6.0
17	Good	3	C	Jan. 24	2------- R--------13.25 R--------13.25
30	Fair	5	W	Jan. 9	2------- R-------- 8.75 R-------- 9.0
37	Good	3	C	Feb. 4	1------- R-------- 9.25
92	Good	5	C	Apr. 1	1------- R-------- 8.0
109	Good	3	C	Jan. 22	1------- R-------- 4.25
55	Thin	5	W	Jan. 4	2------- R-------- 8.25 R--------12.0



56

Group IV. Ewes, Oxford Ram.

New ewes sent on drive	Condition of ewes in Aug.	Age of ewe	White or colored face	Date of lambing	No. of lambs	Sex of lambs	Birth Weight
211	Good	8	W	Feb. 24	1	E	11.25
212	Thin	1	C	Apr. 10	2	R	7.0
						E	7.0
213	Fair	4	W	Feb. 3	1	R	11.5
214	Fair	8	W	Jan. 18	1	E	9.0
215	Thin	8	W	Feb. 2	1	E	12.75
219	Fair	1	W	Apr. 10	2	E	6.0
						E	4.0
222	Good	4	C	Jan. 22	1	E	8.75
225	Good	5	W	Apr. 3	2	E	7.0
						R	8.0
227	Fair	4	C	Jan. 29	1	E	10.5
229	Thin	8	W	Feb. 13	1	E	9.5
New ewes not driven							
216	Good	4	C	Jan. 31	2	R	10.0
						E	9.75
217	Thin	8	W	Jan. 23	1	E	10.5
218	Fair	1	C	Feb. 22	1	R	10.5
220	Good	8	W	--	ewe died		
221	Thin	1	W	Mar. 7	1	E	7.75
223	Fair	1	W	Jan. 31	1	R	13.0
224	Fair	2	W	Mar. 1	1	E	8.25
226	Good	6	C	Feb. 6	2	E	10.0
						E	9.5
228	Thin	1	C	Mar. 4	1	R	12.75
230	Thin	8	C	Jan. 31	3	R	6.0
						E	3.75
						R	7.0

Group IV. Continued.

Old ewes sent on drive						
2	Good	4	W	Jan. 31	2	R 9.5 E 8.75
29	Good	5	C	Jan. 12	2	E 9.25 E 11.25
10	Good	6	W	Jan. 11	2	R 10.0 E 10.0
18	Good	6	C	Jan. 15	1	E 11.75
34	Good	5	W	Jan. 28	2	E 8.0 R 8.25
53	Good	4	W	Jan. 7	2	E 8.0 R 11.0
70	Good	6	C	Feb. 2	2	E 8.0 R 9.0
Old ewes not driven						
91	Good	6	C	Jan. 23	3	R 9.0 R 9.0 E 8.0
66	Good	5	W	Feb. 11	2	E 9.0 R 10.0
69	Fair	4	W	Jan. 23	1	E 13.0
89	Good	5	C	Jan. 18	2	R 11.25 E 11.75
90	Good	3	W	Jan. 19	1	E 12.0
93	Good	6	C	Jan. 25	2	R 12.25 E 11.0

Group V. Ewes, Scrub Ram.

New ewes sent on drive	Condition of ewes in August	Age of ewes	White or colored face	Date of lambing	No. of lambs	Sex of lambs	Birth weight
231	Thin	2	W	Jan. 24	2	(E	7.00
						(R	7.00
232	Thin	7	W	Apr. 10	2	(E	11.00
						(R	9.00
236	Good	5	W	Mar. 17	2	(E	8.00
						(E	8.00
237	Good	3	W	Jan. 27	2	(E	11.75
						(R	10.50
239	Thin	8	W	Feb. 9	1	(E	9.75
241	Good	6	W	Jan. 19	1	E	11.00
242	Thin	1	C	Mar. 13	1	R	7.50
						(R	7.00
246	Fair	8	W	Jan. 22	2	(E	8.75
248	Thin	3	W	Jan. 26	1	R	14.75
						(E	8.00
346	Thin	8	W	Jan. 29	2	(E	8.00
New ewes not driven							
233	Good	6	W	Jan. 23	1	R	9.50
234	Good	2	C	Jan. 20	1	E	11.00
235	Fair	4	W	Jan. 22	1	E	11.50
238	Fair	2	C	Apr. 5	1	R	11.00
						(E	9.00
240	Good	6	W	Jan. 25	2	(E	7.75
						(R	7.75
243	Good	7	W	Jan. 24	2	(R	7.25
244	Fair	6	W	Mar. 11	1	R	9.75
245	Thin	7	W	Jan. 12	1	E	10.00
249	Thin	8	W	Feb. 21	1	R	10.00

67

Group V. Continued.

Old ewes sent on drive						
40	Good	6	C	Jan. 27	2------(E-------	9.50
					(E-------	6.75
					(R-------	10.00
44	Good	3	C	Apr. 2	2------(R-------	9.00
					(E-------	9.75
61	Thin	6	W	Jan. 22	2------(R-------	10.25
					(E-------	8.50
79	Good	6	W	Jan. 22	2------(E-------	7.75
					(E-------	11.00
88	Good	6	C	Jan. 18	2------(E-------	8.00
Old ewes not driven						
					(E-------	10.00
48	Good	6	W	Jan. 28	2------(E-------	8.75
					(R-------	8.00
62	Good	6	C	Mar. 25	3------(R-------	8.00
					(E-------	6.00
102	Good	3	C	Jan. 4	1-------E-------	14.00
106	Good	4	W	Jan. 22	1-------R-------	10.00
103	Thin	6	W	Feb. 4	1-------E-------	9.50

27 E

18 R

Fig. 11. Hampshire Ram Used Both Years.

Fig. 12. Oxford Ram Used 1921-22.

Three of the ewes died before lambing and seven were reported as not lambing. The whole flock of ewes dropped 231 lambs or an average for the flock of 1.45. The average for the ewes that lambed was 1.55.

Effect of Age of Ewe upon Production.

Estimates were made of the age of each ewe in August 1921, as was done the previous year. The following table gives a summary of birth data by ages of ewes:

Table 8. Summary of Birth Data by Ages of Ewes.

Ages Yrs.	No. of ewes lambing	No. of lambs dropped	Av. wt. of lambs at birth	Per cent of ewes having twins or triplets	Av. No. of lambs per ewe of each age
1	14	20	8.31	42.7	1.43
2	10	14	8.75	40.0	1.40
3	16	24	10.37	50.0	1.50
4	18	22	10.13	22.2	1.11
5	21	38	9.30	77.3	1.81
6	29	49	9.25	58.5	1.68
7	16	27	8.54	62.4	1.68
8	25	38	8.76	52.1	1.52
Totals	149	231			
		Averages	9.22	55.7	1.55

There seems to be an increase in fecundity from 3 to 7 years. The average number of lambs was highest at 5 years of age. At 8 years of age the ewe begins to lose vitality and fecundity.

Effect of Type ofEwe upon Lamb Production

The ewes during the year 1921-22, described according to color of face and legs. Those with dark or colored faces showed traces of breeding of the down breeds, while those with white faces showed but little improved breeding.

74

Table 9. Effect of Type of Ewe on Lamb Production

Description of ewe	No. of ewes lambing	Av. No. lambs dropped	Av. date of lambing	No. ewes raising lambs to market	Av. wt. of lambs marketed per ewes raising lambs	Av. daily gain of lambs.
White faces	89	1.56	Feb. 3	85	100.3	.67
Dark faces	60	1.53	Feb. 10	54	101.1	.70

There was practically no difference between dark-faced and white-faced ewes in their production of lambs. The average date of lambing for the white-faced ewes was one week earlier than the dark-faced ewes, but on the other hand the dark-faced ewes produced an average of one pound more of lamb for the market.

Effect of Condition of Ewe at Breeding Time on Lamb Production.

Data was again collected in 1921-22 experiments on the condition of ewes at the beginning of the breeding season. They were described as "thin", "fair", or "good", according to the amount of flesh they carried. They were well distributed between the groups, (see Table 6).

Table 10. Effect of Condition of Ewe on Lamb Production

Condition of ewe	Total No. ewes lambing	Av. No. of lambs dropped per ewe	Av. date of lambing	Av. wt. of lamb marketed per ewe lambing	Av. daily gain of each lamb
Thin	37	1.46	Feb. 12	93.0	.68
Fair	44	1.41	Feb. 8	88.7	.68
Good	68	1.68	Jan. 31	101.1	.71

There were 37 ewes classed as "thin", 44 as "fair", and 68 as "good". The ewes in thin condition bred an average of 13 days later than those in good condition at time of turning in the ram, dropped .22 less lambs per ewe, and marketed 8.1 lbs. less per ewe. It seems to be important that the ewes be in good condition at the beginning of the breeding season. If ewes in good condition will breed from one to two weeks earlier and produce more lambs per ewe than ewes in thin condition, it means that the profits may be much more per ewe owing to more favorable markets and more lamb. Such difference in gain of lambs was in favor of the lambs from ewes in good condition.

Effect on Lamb Production of Driving Ewes

The flocks were divided as in the previous year and one half of each flock given a drive of 17 miles. Upon returning each ewe was returned to its respective group and rams turned with their respective groups. The plan was modified this year at the suggestion of sheep men by putting each flock in a small enclosure in the barn for the first night. The following table gives the results:

Table 11. Results on Lamb Production of Driving Ewes

	No.	No. of ewes lambing	Av. date of lambing	Av. No. of lambs per ewe lambing
Ewes driven	78	75	Feb. 8	1.60
Ewes not driven	81	74	Feb. 4	1.50

Effect of Castration on Male Lambs.

While in this data no check of our uncastrated male lambs were kept yet the data from the ewe lambs may be offered as a partial check. It was, for example, that the average daily gain of the wether lambs was .71 pound while that of the ewe lambs was .67 pound. Apparently the castration of the male lambs did not check their growth.

The average date of lambing for the ewes that were driven before turning the rams with them was Feb. 8, and for the ewes not driven, it was Feb. 4. These results check with the previous. Evidently there is no benefit to be derived from giving ewes a long drive before turning in the rams.

Influende of Rams of Various Breeds upon Production of Early Spring Lambs.

Complete data was kept on all ewes (see page), as was also for each lamb, including the grade of the carcass after slaughter in Chicago. The following table will show the production of the ewes of each group:

Table 12. Production of Ewes of Each Group, 1922, that Produced Lambs that were Marketed.

Group	No. of ewes living at market time that marketed lambs	No. of ewes dead at market time that marketed lambs	Av. wt. living ewes June 1922	Av. gain living ewes	No. lambs born	Av. birth wt. lambs born	No. of lambs marketed	No. of lambs marketed per ewe	Av. total wt. of lambs marketed per ewe
I	21	0	120.5	8.0	31	9.25	28	1.33	92.5
II	30	3	115.6	11.5	55	8.33	54	1.64	110.0
III	28	4	122.5	14.1	48	9.50	41	1.28	93.7
IV	23	4	125.4	15.8	39	10.20	38	1.41	102.5
V	26	2	125.9	17.6	44	9.25	44	1.57	103.0
	128	13			217		205		

The average gain of ewes of the various groups was from 8 to 17 pounds. The average birth weight was largest for lambs served by the Oxford ram. Hampshire and Southdown lambs were nearly the same and Shropshire the smallest at birth.

When the lambs were ready for market they were separated from their dams and put in a pen and graded into market classes by Mr. G. L. Watkins, Nashville,Tenn. assisted by Mr. C. C. Flanery, Nashville, Tenn. There were two shipments, one on May 3d, and the other on June 9th. The lambs for the first shipment were graded into the classes, Prime, Good, and Seconds. The second shipment was graded into Prime, Good, Second, and Culls. After the grading was completed, complete records were made of each lamb. The lambs were shipped and sold by grade on the Nashville Market and then consigned to Armour & Company, Chicago, Ill., where slaughter data of each carcass werecollected,including dressing percentages and market carcass grading. As the head was severed from the carcass the ear label was slit from the ear and then fastened to the carcass. There was, therefore, the least possible chance of knowing at the time of grading the breed of the carcass. Tables 13 and 14 give the data collected on lamb and its dam.

83

DATA ON LAMBS SOLD MAY 3, 1922

Prime lambs above 1st line
Good above 2nd line
Seconds above 3rd line

S—Strictly choice carcass; R--Good quality carcass; M--Medium quality carcass; X--Poor quality carcass; XX--Very poor quality carcass.

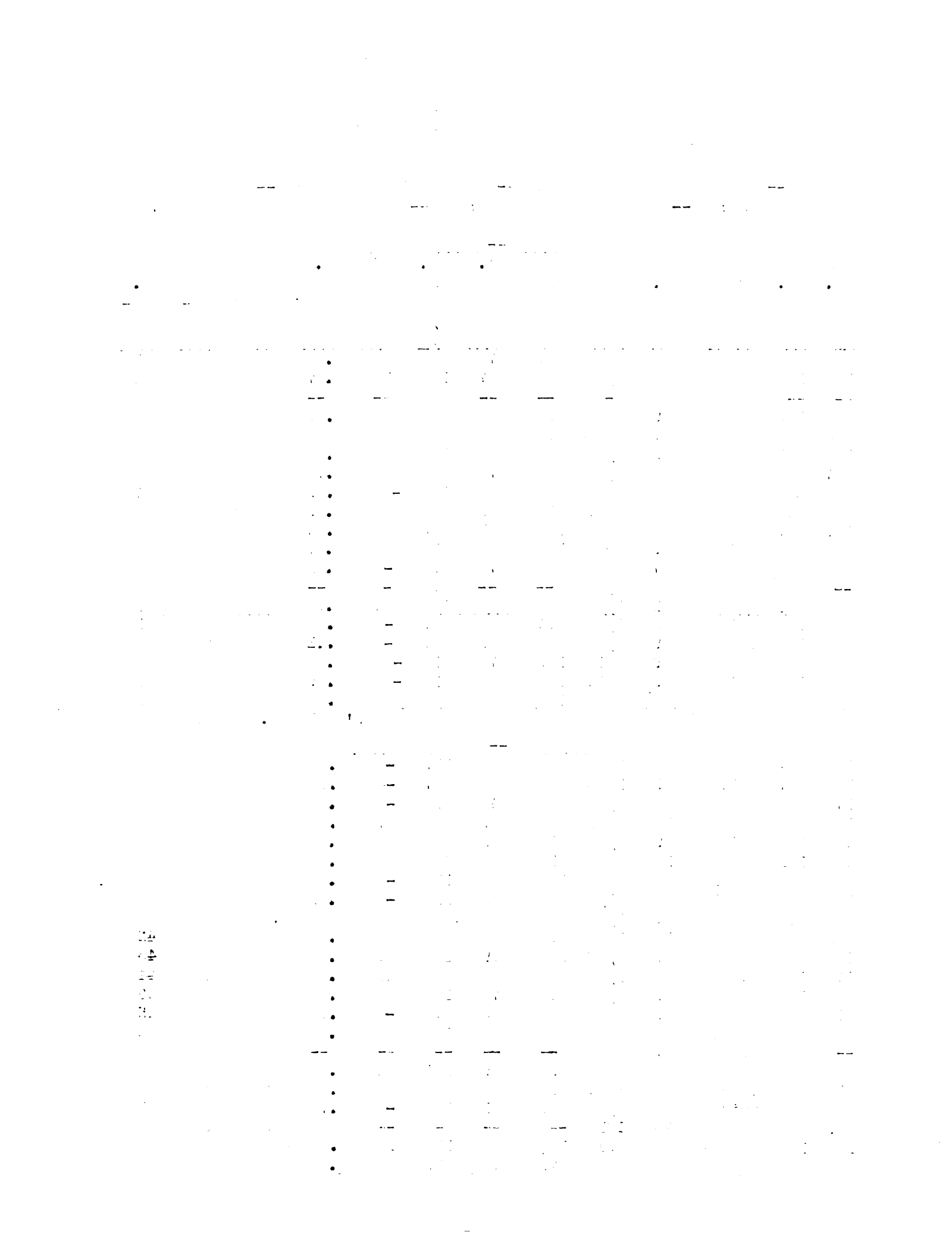
GROUP I--SOUTHDOWN SIRE

Lamb No.	Ewe No.	Twin or single	Birth wt.	Date of birth	Days old	Wt. of lamb	Wt. of ewe 5/2 1922	Gain of ewe Aug 6 May 2	Av.* daily gain of lamb	Ewe or wether lamb	Grade of car-cass	Net wt. of car-cass
197	166	single	10¼	1/23	99	74	122	11	.74	ewe	S	41
147	154	twin	6¾	1/23	99	67	145	16	.67	ewe	S	34
--	--	twin	8	--	—	—	—	--	—	ewe died, date unknown		
203	168	twin	9¾	1/26	96	66	111	2	.69	ewe	R	35
204	168	twin	7¼	1/26	96		111	2				
168	81	twin	9	1/24	98	67	130	2	.68	ewe	S	35
167	81	twin	10½	1/24	98	72	130	2	.73	wether	S	38
151	164	single	8¾	1/23	99	68	105	-10	.69	ewe	S	37
112	75	single	11¼	1/ 9	113	79	95	1	.69	wether	S	42
139	157	single	10¼	1/17	105	81	103	13	.77	wether	S	44
165	151	twin	9½	1/22	100	67	116	1	.67	ewe	S	35
182	160	twin	7¼	1/24	98	70	94	-2	.71	wether	S	38
—	160	twin	8	1/24	—	--	94	-2	—	ewe died, injured in barn		
140	41	single	11	1/20	102	77	168	17	.75	ewe	S	41
174	152	twin	8¼	1/25	97	62	119	-6	.64	wether	S	31
175	152	twin	9¾	1/25	97	59	119	-6	.61	wether	S	31
133	155	twin	9	1/17	105	70	116	-15	.66	wether	S	38
134	155	twin	9	1/17	105	62	116	-15	.59	ewe	R	31
166	151	twin	8½	1/22	100	60	116	1	.60	ewe	S	31

*339's old No. was 49

GROUP II--SHROPSHIRE SIRE

113	67	twin	8¾	1/ 4	118	86	117	-4	.73	ewe	S	45
114	67	twin	9¼	1/ 4	118	86	117	-4	.73	wether	S	44
178	190	twin	8	1/25	97	68	90	-3	.70	wether	S	36
142	339*	single	10¼	1/19	103	87	165	17	.84	wether	R	47
101	171	twin	9	1/ 4	118	89	111	3	.75	wether	S	44
102	171	twin	10½	1/ 4	118	89	111	3	.75	wether	S	46
148	52	triplet	6	1/20	102	62	110	-5	.60	ewe	S	34
149	52	triplet	5¼	1/20	102	70	110	-5	.69	ewe	S	36
0	52	triplet	7	1/20	Hand raised. Not yet marketed. ewe							
202	45	single	10¾	1/26	96	78	124	1	.81	wether	S	42
138	100	single	9¾	1/17	105	79	154	7	.75	ewe	S	45
171	176	single	8¾	1/22	100	80	105	11	.80	ewe	S	44
198	187	single	9¼	1/24	98	74	131	11	.75	ewe	S	38
118	80	single	9½	1/ 9	113	83	75	-1	.73	wether	S	45
177	183	triplet	7½	1/24	98	65	104	0	.66	wether	R	32
—	183	triplet	7	1/24	—	—	--	—	—	wether		
222	20	single	10½	1/29	93	69	124	14	.74	ewe	S	36
115	23	twin	10	1/ 7	115	77	158	5	.67	wether	S	39
120	11	twin	10½	1/13	109	81	121	-3	.74	ewe	S	41
119	11	twin	10	1/13	—	—	—	—		ewe died, unknown		
132	186	single	8	1/19	103	70	115	10	.68	ewe	S	38
250	1	single	10¼	2/12	79	70	117	1	.88	ewe	S	38



GROUP II--SHROPSHIRE SIRE--Continued

179	190	twin	6	1/25	97	60	90	-3	.62	wether	M	30
160	16	twin	9¾	1/23	99	67	dead		.67	ewe	M	33
243	175	single	7½	2/10	84	66	95	6	.79	wether	R	34
185	172	twin	9¾	1/22	100	82	103	17	.82	ewe	S	46
200	172	twin	10¼	1/22	100	71	103	17	.71	wether	S	35
164	341	twin	7	1/23	99	63	97	11	.64	ewe	R	34
176	183	triplet	7½	1/24	98	67	104	0	.68	wether	S	39
116	23	twin	8½	1/ 7	115	75	158	5	.65	ewe	S	41
159	16	twin	9¾	1/23	99	68	dead		.68	wether	M	32
163	184*	twin	7½	1/23	99	63	97	11	.64	ewe	R	32
173	178	twin	10½	1/21	101	68	dead		.68	wether	R	35

85

DATA ON LAMBS SOLD MAY 3, 1922

Prime lambs above 1st line
Good above 2nd line
Seconds above 3rd line

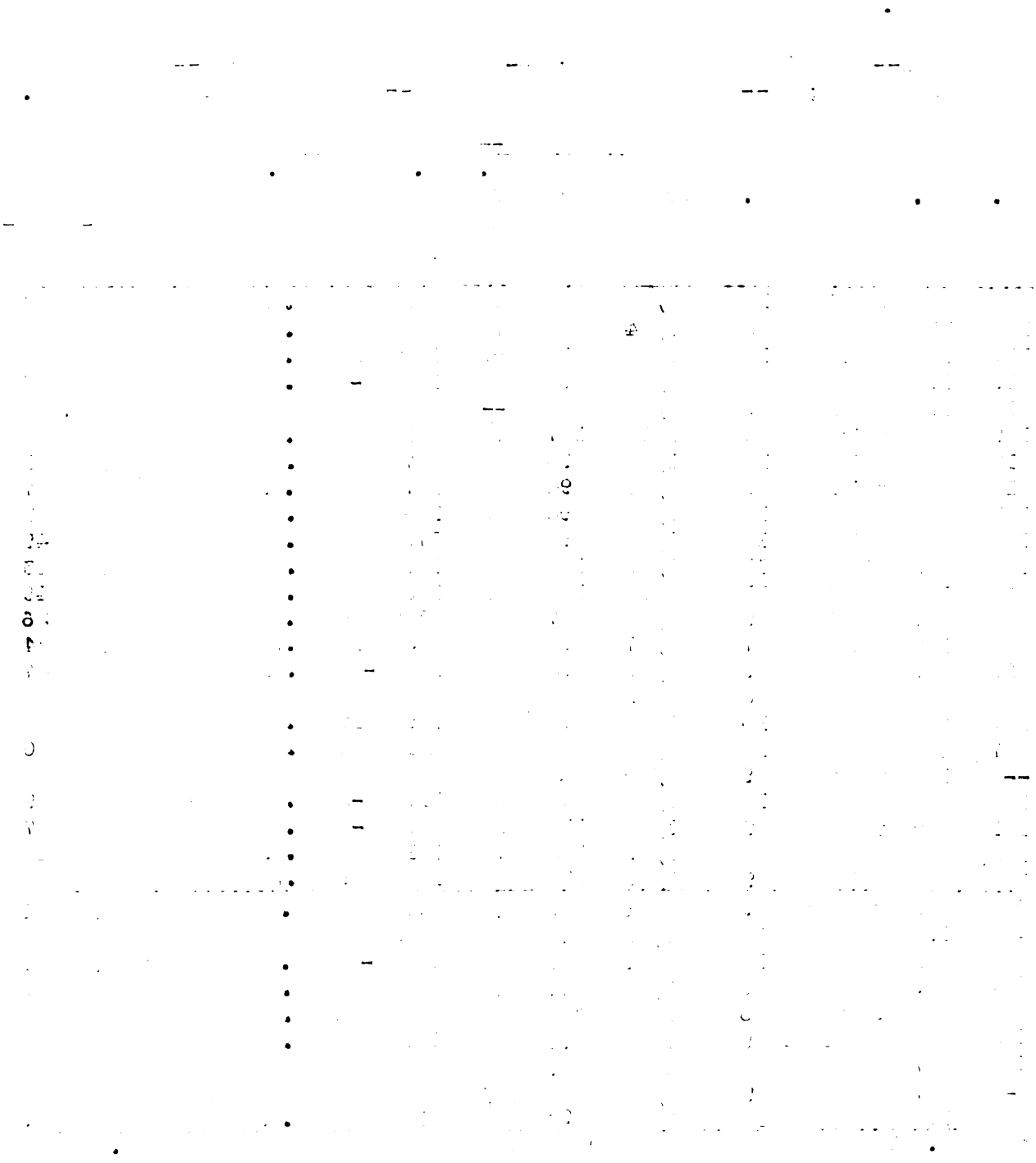
S--Strictly choice carcass; R—Good quality carcass; M--Medium quality carcass; X--Poor quality carcass; XX--Very poor quality carcass.

GROUP III—HAMPSHIRE SIRE

Lamb No.	Ewe No.	Twin or single	Birth wt.	Date of birth	Days old	Wt. of lamb	Wt. of ewe 5/2 1922	Gain of ewe Aug 6 May 2	Av.* daily gain of lamb	Ewe or wether lamb	Grade of carcass	Net wt. of carcass
246	208	single	10¾	2/ 8	83	68	115	4	.82	ewe	R	36
103	116	twin	8¼	1/ 4	118	78	120	28	.66	ewe	S	42
117	116	twin	12	1/ 4	118	97	120	28	.82	ewe	R	54
219	194	twin	8¾	1/28	94	70	138	-1	.74	ewe	S	36
218	194	twin	9½	1/28	dead	—				ewe unknown, was weak		
129	205	twin	6¾	1/15	107	73	121	26	.68	wether	R	36
212	6	twin	10	1/28	94	77	137	10	.82	wether	S	41
213	6	twin	9	1/28	94	74	137	10	.79	ewe	S	37
161	17	twin	13¼	1/24	98	96	176	11	.98	wether	R	49
162	17	twin	13¼	1/24	98	94	176	11	.96	wether	R	49
184	109	single	11¼	1/22	100	86	125	2	.86	wether	S	43
123	195	single	11¾	1/17	105	91	128	18	.86	wether	R	49
236	37	single	9¼	2/ 4	87	70	120	5	.80	ewe	S	36
208	192	twin	7¾	1/27	95	71	113	18	.75	wether	S	34
220	97	twin	9¼	1/29	93	85	136	-10	.91	wether	R	47
221	97	twin	8½	1/29	93	dead				ewe	Lamb never did well	
154	200	single	10¼	1/24	98	86	129	19	.88	wether	S	46
237	104*	twin	10	2/ 5	86	72	141	0	.84	wether	S	40
—	104	twin	9½	2/ 5	came dead					ewe		
122	50	twin	10	1/ 7	115	92	119	-5	.80	ewe	R	49
121	50	twin	9½	1/ 7	115	90	119	-5	.80	ewe	R	47
105	250	twin	8¾	1/ 9	113	79	121	9	.69	wether	R	43
104	250	twin	9	1/ 9	113	83	121	9	.73	wether	S	44
135	201	single	9¼	1/19	103	93	91	4	.90	wether	R	51
183	196	single	10¼	1/25	97	70	dead			ewe	S	34
241	251	single	15¼	2/ 9	82	74	108	-12	.88	wether	R	39
199	209	single	8½	1/23	99	73	98	8	.74	wether	S	38
130	205	twin	6¾	1/15	107	69	121	26	.64	ewe	S	35
143	7	triplets	9	1/23	99	66	151	24	.67	wether	M	32
144	7	triplets	8	1/23	99					ewe		
--	7	triplets	9	1/23	dead injured in barn					wether		
207	192	twin	12	1/27	95	75	113	18	.79	ewe	S	39

*New No. 115

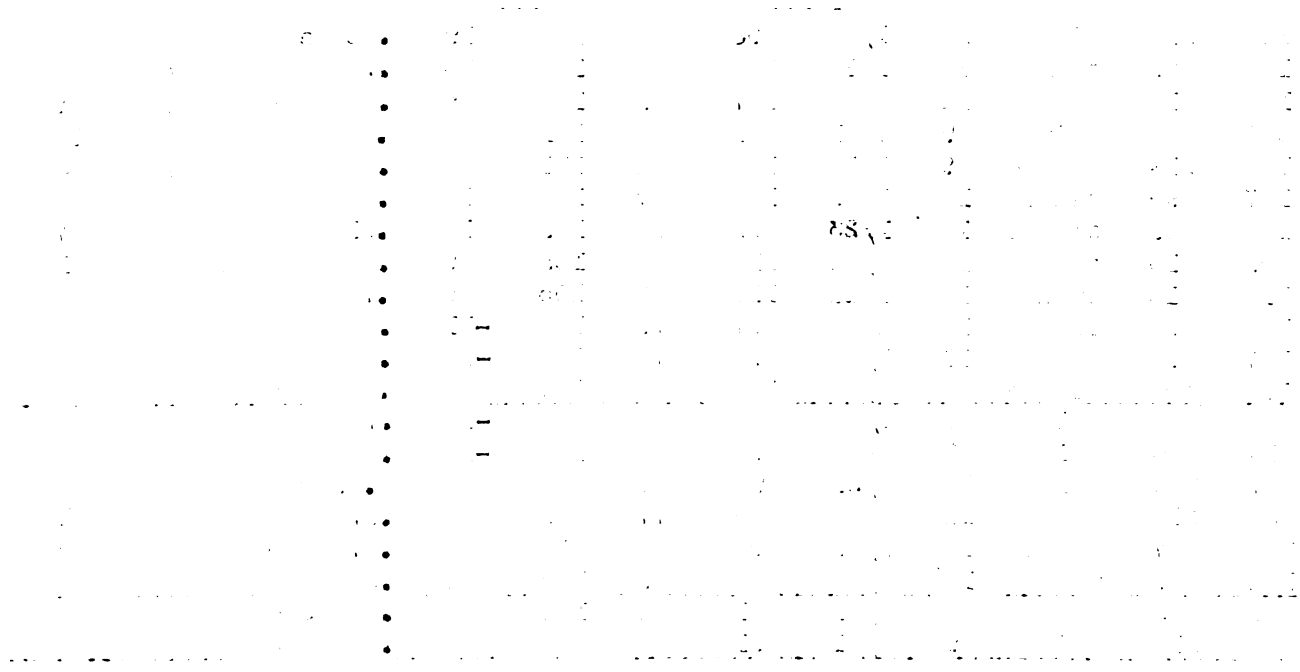
*Figured to include the birth weight.



56

GROUP IV--OXFORD SIRE

146	217	single	10½	1/23	98	68	124	19	.66	ewe	S	34
125	89	twin	11¼	1/18	104	80	180	24	.73	wether	R	40
106	18	single	11¾	1/15	107	89	148	5	.78	ewe	R	49
230	2	twin	9½	1/31	91	78	151	8	.85	wether	S	36
126	214	single	9	1/18	104	84	111	6	.77	ewe	S	44
127	90	single	12	1/19	103	87	125	10	.84	ewe	S	46
145	69	single	13	1/25	99	90	129	14	.91	ewe	S	47
109	10	twin	10	1/11	111	78	105	9	.70	wether	S	41
110	10	twin	10	1/11	111	82	105	9	.74	ewe	S	44
158	93	twin	12¼	1/25	97	79	122	-11	.81	wether	S	40
157	93	twin	11	1/25	97	77	122	-11	.80	ewe	S	38
195	222	single	8¾	1/22	100	78	137	8	.78	ewe	S	34
215	34	twin	8	1/28	94	70	104	-13	.75	ewe	S	36
214	34	twin	8¼	1/28	94	66	104	-13	.70	wether	S	34
227	216	twin	10	1/31	91	63	dead		.69	wether	M	28
234	213	single	11½	2/ 3	88	77	89	18	.87	wether	R	41
225	227	single	10½	1/29	93	62	died		.67	ewe	unknown	30
124	89	twin	11¼	1/18	104	69	180	24	.66	ewe	R	34
229	2	twin	8¾	1/31	91	64	151	8	.70	ewe	R	32
228	216	twin	9¼	1/31	91	58	dead		.64	ewe	M	28



DATA ON LAMBS SOLD MAY 3, 1922

Prime lambs above 1st line
Good above 2nd line
Seconds above 3rd line

S--Strictly choice carcass; R--Good quality carcass; M--Medium quality carcass; X--Poor quality carcass; XX--Very poor quality carcass.

GROUP V--SCRUB SIRE

Lamb No.	Ewe No.	Twin or single	Birth wt.	Date of birth	Days old	Wt. of lamb	Wt. of ewe 5/2 1922	Gain of ewe Aug 6 May 2	Av.* daily gain of lamb	Ewe or wether lamb	Grade of carcass	Net wt. of carcass
181	252	single	10	1/22	100	74	125	6	.74	wether	S	39
128	234	single	11	1/20	102	79	147	27	.77	ewe	S	43
186	235	single	11 1/8	1/22	100	85	120	19	.85	ewe	R	47
100	102	single	14	1/ 4	118	95	169	22	.80	ewe	R	52
189	240	twin	9	1/25	97	65	135	-1	.67	ewe	R	35
190	240	twin	7 3/4	1/25	97	69	135	-1	.71	ewe	S	36
136	88	twin	11	1/18	104	70	128	-4	.67	ewe	S	37
137	88	twin	8	1/18	104	67	128	-4	.64	ewe	R	34
131	241	single	11	1/19	103	86	155	44	.83	ewe	S	46
111	245	single	10	1/12	110	81	105	30	.73	ewe	S	42
211	237	twin	11 3/4	1/27	95	65	155	18	.68	ewe	S	35
191	79	twin	8 1/8	1/22	100	71	115	8	.71	ewe	S	36
152	246	twin	7	1/22	100	72	135	27	.72	wether	S	38
153	246	twin	8 3/4	1/22	100	68	135	27	.68	ewe	S	37
193	253	twin	9 3/4	1/22	100	67	76	-9	.67	ewe	S	35
205	40	twin	6 3/4	1/27	95	65	186	22	.69	ewe	R	33
	40	twin		1/27	95					ewe		
340	248	single	14 3/4	1/26	96	74	104	12	.78	wether	M	38
224	346	twin	8	1/29	93	66	100	11	.71	ewe	M	31
223	346*	twin	8	1/29	93	63	100	11	.67	ewe	R	34
169	243	twin	7 3/4	1/24	98	63	110	18	.64	wether	M	32
170	243	twin	7 1/4	1/24	98	63	110	18	.64	wether	M	32
210	237	twin	10 1/2	1/27	95	62	155	18	.65	wether	R	33
194	253	twin	10 1/4	1/22	100	65	76	-9	.65	wether	M	33
192	79	twin	7 3/4	1/22	100	65	115	8	.65	ewe	S	34

In explaining grading of carcasses, Mr. H. A. Phillips, of Armour & Company, wrote on May 9, 1922:

"Our S grade lambs are strictly choice; in fact, they are the lambs that are supposed to be fancy. The lambs graded R are very good quality but not strictly good enough to be termed fancy, but they are good selling lambs. Our M Grade lambs are medium; they are better than culls, but the word medium describes their quality. Quite a good many of these R lambs, you will note, carry considerable weight and a lot of them were strictly choice in quality but are too heavy to be thrown into our S grade of lambs. We make 45# maximum on S lambs.

In going through this bunch of lambs I gave carcass #103 First, carcass 140 Second and carcass 138 Third, and I also recommended carcasses 147, 148, and 166 as being far above the average. Carcasses 147 and 148, you will notice, are light weights but they were certainly good; lacked just a little of being full in the loin. Outside of this they were pretty nearly perfect. No. 103, our first choice, is a mighty fine individual, extra good in the legs and loin, good thickness of rib but just is a little heavy in the shoulder and neck. This is the only criticism that I have on this lamb. No. 140 was an excellent individual; a little longer in the body and not quite as good in the legs but a good thick lamb. No. 138 was smooth in every way. If he had been coupled a little shorter and carried a trifle more flesh he would have been our first choice. You understand that the dressed weight on these individuals is the hot weight shrunk 3% to take care of our shrink in the cooler. This bunch of lambs killed in the whole made a little over 52% shrunk, which is a very high dressing, in fact, are better than we get out of our straight purchases on the Nashville market."

The carcass ranking first was sired by a Hampshire ram, second, by a Southdown ram, and third, by a Shropshire ram. Carcasses given honorable mention were 147 by Southdown sire, 148 by Shropshire sire, and 166 by Southdown sire.

89

Table 14. DATA ON LAMBS SOLD JUNE 9, 1922.

Prime lambs above 1st line
Good above 2nd line
Seconds above 3rd line
Culls above 4th line

Group I--Southdowns

	Lamb no.	Ewe no.	Twin or single	Birth wt.	Date of birth	Days old	Wt. of lamb	Wt. of ewe 6/9 1922	Gain of ewe Aug 6 June9	Av.* daily gain of lamb	Ewe or wether lamb	
S	266	74	single	10¾	3/1	100	82	154	8	.82	ewe	40
S	261	156	single	9¼	2/25	104	78	134	59	.75	wether	41
S	264	162	single	11	2/26	103	79	133	16	.75	wether	42
S	245	118	twin	9¾	2/8	121	82	140	15	.67	ewe	41
R	244	118	twin	9¼	2/8	121	88	140	15	.73	ewe	48
S	275	163	single	9¼	3/6	95	67	83	8	.70	ewe	36
S	260	159	twin	6¾	2/23	106	60	161	15	.56	ewe	29
S	259	159	twin	7	2/23	106	65	161	15	.61	ewe	31
S	255	170	single	10	2/20	109	67	85	3	.61	ewe	32
S	271	167	single	8¼	3/1	100	55	108	8	.55	ewe	26
S	265	158	twin	7	2/26	103	58	111	26	.56	ewe	30
	---	158	twin	6	2/26	came dead					ewe	
M	204	168	twin	7¼	1/26	134	58	----		.43	wether	25

Group II--Shropshires

S	274	173	single	8	3/5	96	67	119	44	.70	ewe	35
S	240	188	single	6	2/7	122	72	121	25	.59	ewe	37
R	327	52	triplet	7	1/20	140	62	(see sheet 5/3)		.44	ewe(hand raised)	29
S	172	178	twin	9¼	1/21	139	72	dead		.51*	hemorrhagic	35
	173	(sold on May 3)										
S	290	183	triplet	7	1/24	136	67	(see sheet 5/3)		.49	ewe	29
S	187	185	twin	8	1/24	136	82	125	27	.60	ewe	38
R	252	174	single	10¾	2/15	114	88	82	11	.77	wether	44
R	267	177	twin	8½	3/2	99	61	129	38	.62	wether	26
S	268	177	twin	7½	3/2	99	62	129	38	.62	ewe	28
R	188	185	twin	8	1/24	136	74	125	27	.54	ewe	34
S	242	181	single	10¼	2/7	122	77	105	8	.63	ewe	42
X	283	13	triplet	8	3/16	85	53	dead	---	.62	wether	22
M	282	13	triplet	8	3/16	85	57	dead		.67	ewe	25
R	269	180	twin	7	3/1	100	63	119	20	.63	ewe	30
R	270	180	twin	6¾	3/1	100	54	119	20	.54	ewe	24
R	281	179	twin	8	3/15	86	61	117	22	.70	wether	30
M	263	189	twin	7½	2/24	105	61	81	7	.58	wether	24
R	262	189	twin	7¼	2/24	105	55	81	7	.52	ewe	23
X	299	225	twin	7	4/3	67	39	135	20	.58	ewe	17
X	298	225	twin	8	4/3	67	29	135	20	.43	wether	11
R	280	179	twin	8	3/15	86	56	117	22	.65	wether	26
X	324	219	twin	6	4/10	60	31	119	25	.51	ewe	16
X	325	219	twin	4	4/10	60	38	119	25	.63	ewe	14
X	284	13	triplet	7	3/16	85	38	dead		.45	ewe	15

*Birth wt. included.

90

DATA ON LAMBS SOLD JUNE 9, 1922

Prime lambs above 1st line
Good above 2nd line
Seconds above 3rd line
Culls above 4th line

Group III--Hampshires

	Lamb no.	Ewe no.	Twin or single	Birth wt.	Date of birth	Days old	Wt. of lamb	Wt. of ewe 6/9 1922	Gain of ewe Aug 6 June 9	Av.* daily gain of lamb	Ewe or wether lamb	
S	276	210	single	8	3/7	94	63	111	17	.67	ewe	34
R	196	191	single	12¼	1/25	135	83	dead		.61	wether	38
M	319	7(335)	single	9	4/8	62	50	134	7	.80	ewe	26
S	292	199	twin	9	3/23	78	51	111	3	.65	ewe	27
R	291	199	twin	8	3/23	78	51	111	3	.65	ewe	26
S	296	204	twin	8	4/1	69	58	130	41	.84	ewe	29
-	297	204	twin	8	4/1	missing						
S	288	207	single	10	3/17	84	64	110	27	.76	wether	34
S	253	203	twin	7¼	2/16	113	72	105	29	.63	ewe	36
R	254	203	twin	6	2/16	113	62	105	29	.55	wether	28
R	318	92	single	8	4/5	65	54	124	3	.83	wether	27
R	279	197	twin	10	3/15	86	61	101	18	.71	wether	30
	---	197	twin	13	3/15	--	---	died unknown				
R	209	198	single	10	1/28	132	62	dead		.47	ewe	28
X	285	9	twin	8	3/16	85	48	dead		.57	wether	20
	---	9	twin	6	3/16	--	--	dead		---	ewe died unknown	

Group IV--Oxfords

S	248	66	twin	9	2/11	118	78	112	6	.66	ewe	40
S	257	218	single	10½	2/22	107	81	123	46	.76	wether	42
S	238	226	twin	10	2/6	123	92	135	12	.75	ewe	45
S	239	226	twin	9½	2/6	123	82	135	12	.68	ewe	40
S	249	66	twin	10	2/11	118	81	112	6	.69	wether	39
S	251	229	single	9½	2/13	116	77	99	14	.66	ewe	36
R	108	8(342)	twin	9¼	1/12	148	73	dead	--	.49	ewe	31
R	231	230	triplet	6	1/31	129	90	125	29	.70	wether	41
	---	230	triplet	3¾	1/31	---					ewe was weak.	
R	226	223	single	13	1/31	129	80	dead		.62	wether	36
S	258	211	single	11¼	2/24	105	80	174	12	.76	ewe	42
S	277	221	single	7¾	3/7	94	68	105	23	.72	ewe	36
S	107	9(342)	twin	11¼	1/12	148	82	dead	--	.55	ewe	35
R	232	230	triplet	7	1/31	129	76	125	29	.59	wether	34
R	144	7(91)	triplet	8	1/23	137	61	153	24	.44	ewe	27
S	272	224	single	8¼	3/1	100	59	110	25	.59	ewe	29
XX	233	215	single	12¾	2/2	127	52	116	13	.41	ewe	21
X	320	212	twin	7	4/10	60	38	106	31	.63	wether	18
M	321	212	twin	7	4/10	60	39	106	31	.63	ewe	19
M	316	193	single	10	4/4	66	49	123	34	.74	ewe	25

*2nd best carcass in shipment.

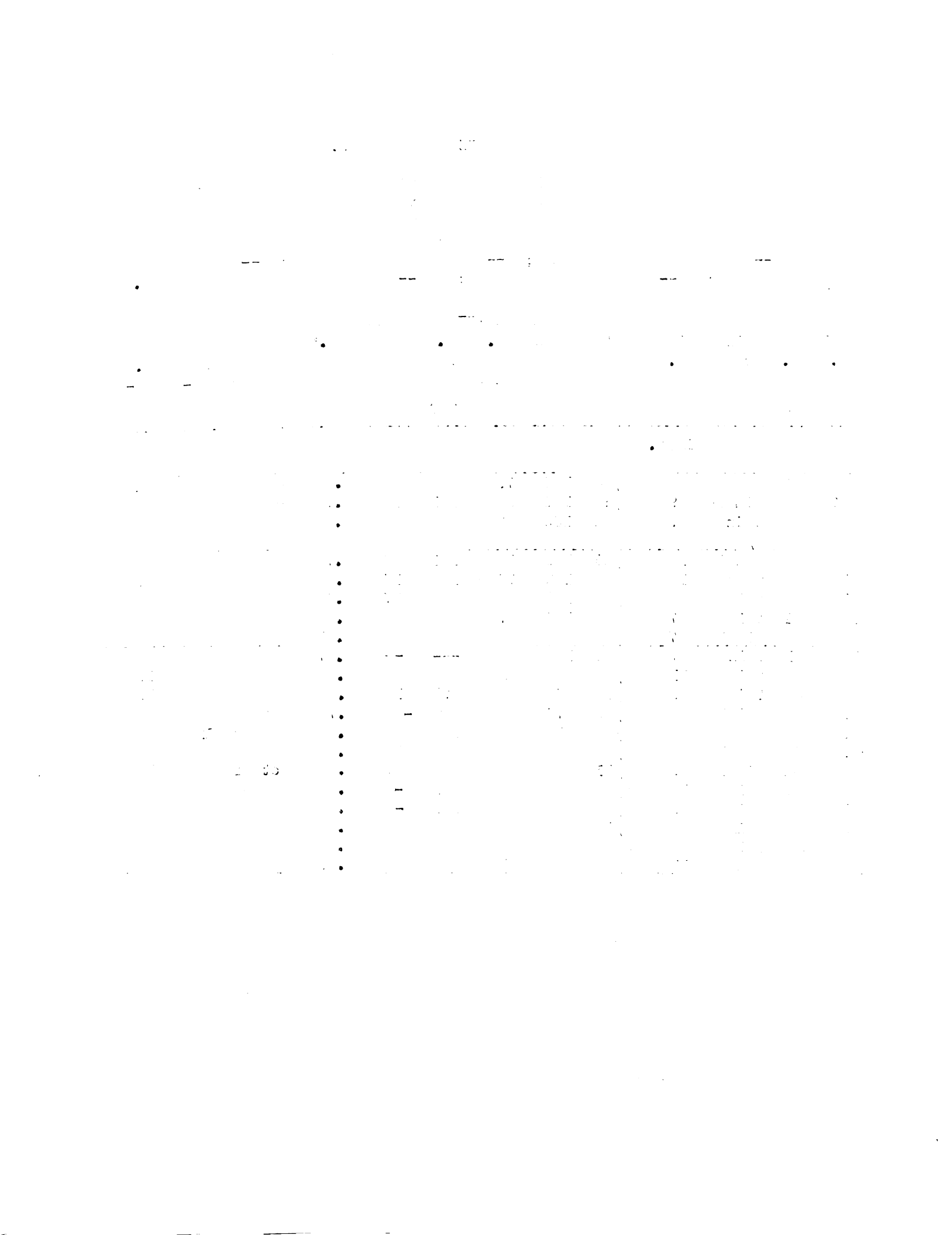
DATA ON LAMBS SOLD JUNE 9, 1922

Prime lambs above 1st line
Good above 2nd line
Seconds above 3rd line

S--Strictly choice carcass; R--Good quality carcass; M--Medium quality carcass; X--Poor quality carcass; XX--Very poor quality carcass.

GROUP V--SCRUB SIRE

Lamb No.	Ewe No.	Twin or single	Birth wt.	Date of birth	Days old	Wt. of lamb	Wt. of ewe 5/2 1922	Gain of ewe Aug 6 May 2	Av.* daily gain of lamb	Ewe or wether lamb	Grade of carcass	Net wt. of carcass
		No primes.										
235	112	single	9⅛	2/4	125	79	85	8	.63	ewe	R	39
247	239	single	9¾	2/9	120	88	121	12	.73	ewe	R	47
206	40	twin	9⅛	1/27	133	82	sold		.62	ewe	S	40
205	sold 5/3											
256	249	single	10	2/21	108	78	121	33	.71	wether	S	40
217	48	twin	10	1/28	132	72	140	17	.55	ewe	R	39
216	48	twin	8¾	1/28	132	80	140	17	.60	ewe	R	35
155	231	twin	7	1/24	136	77			.56	ewe	R	40
278	242	single	7⅛	3/13	88	54			.61	wether	M	26
156	231	twin	7	1/24	136	78	---	--	.57	wether	R	36
322	232	twin	11	4/10	60	42	93	16	.70	ewe	M	19
323	232	twin	9	4/10	60	40	93	16	.70	wether	M	19
294	62	triplet	8	3/25	76	55	133	-10	.72	wether	M	25
295	62	triplet	8	3/25	76	41	133	10	.54	wether	M	17
293	62	triplet	6	3/25	76	47	133	10	.62	ewe	X	22
289	244	single	9¾	3/11	90	43	132	37	.48	wether	X	19
300	44	twin	10	4/2	68	48	121	-6	.70	wether	X	23
315	44	twin	9	4/2	68	44	121	-6	.65	wether	X	20
287	236	twin	8	3/17	84	38	dead		.45	ewe	X	15
286	236	twin	8	3/17	84	44	dead		.52	ewe	X	18
317	238	single	11	4/5	65	51	124	24	.79	wether	M	25



In the second shipment of lambs the three best lambs were, 274, sired by the Shropshire ram, ranking first; 276, by the Hampshire ram, second; and 266, by a Southdown ram, third.

13

Table 15. Market Grading on Foot, First Shipment.

	No.			Total weight			Av. weight		
	Prime	Good	Seconds	Prime	Good	Seconds	Prime	Good	Seconds
				Lbs.	Lbs	Lbs	Lbs	Lbs	Lbs
Southdown	11	5	---	788	313	---	71.6	62.6	---
Shropshire	19	8	3	1463	551	199	77.0	68.9	66.2
Hampshire	21	7	---	1700	520	---	81.1	74.3	---
Oxford	11	6	2	902	407	122	82.0	67.8	61.0
Scrub	4	11	9	333	781	586	85.6	71.1	65.1
	66	37	14	5186*	2572*	907*			
Weight at Stockyards, Columbia				5111	2600	910			
Weight at Stockyards, Nashville				4990	2480	875			
Shrink barn weight to Nashville				196	92	32			
Av. shrink barn weight to Hashville				2.7	2.5	2.3			

*Weight at Middle Tennessee Station barn.

The first shipment of lambs sold on the Nashville market May 3rd for Prime lambs, at $18.00, for Good, $16.50 and Seconds, for $12.50. Table 16 shows the price received per head for lambs sired by rams of the various breeds. The average received per head for the Southdown lambs was $12.10, for the Hampshire lambs $13.99, for the Oxford lambs $12.89, and for the scrub lambs $10.95. The average age of each was about the same. The average daily gains were greatest for the Hampshire and Oxford lambs.

Table 16. Daily Gains and Prices per head of Lambs of First Shipment.

	*Av. daily gain				Per ct. Prime	*Price received per head				Av. days old
	Prime lbs	Good lbs	Seconds lbs	Av. lbs		Prime	Good	Seconds	Av.	
Southdown	.71	.62	---	.68	68	$12.91	$10.31	---	$12.10	101
Shropshire	.74	.69	.66	.72	63	13.85	11.38	8.28	12.93	102
Hampshire	.81	.76	---	.77	75	14.61	12.26	---	13.99	99
Oxford	.81	.72	.68	.77	58	14.78	11.20	7.65	12.89	98
Scrub	.79	.70	.68	.71	16	15.50	11.75	8.14	10.95	100

*Including birth weight.

*Based on College barn weights.

Table 17 is a summary showing grading of carcasses in first shipment. It will be noted that in this shipment the Southdown carcasses ranked first, with 87 per cent of the carcasses grading as S; Shropshire second, with 70 per cent; Oxford third, with 67 per cent; Hampshire fourth, with 53 per cent; and Scrubs last, with 50 per cent. The general classification of the carcasses was similar to the classification on foot. There was not much difference in the dressing percentages.

Table 17. Summary of Slaughter Data--First Shipment

Prime	Total	Carcass grades S	R	M	Av. wt. live lamb-lbs.	Av. wt. carcass lbs.	Av. p.ct. dressed wt.-lbs.	Av. price rec'd per lb live wt.	Av. price rec'd per head
Southdown	11	10	1	--	71.6	38.2	53.2	18¢	$12.91
Shropshire	19	17	2	--	77.0	40.5	52.6	18¢	13.88
Hampshire	21	11	10	--	81.1	42.5	52.4	18¢	14.59
Oxford	11	9	2	--	82.0	41.6	50.6	18¢	14.76
Scrub	4	2	2	--	85.6	45.2	54.4	18¢	15.41
Good									
Southdown	5	4	1	--	62.6	32.4	51.7	16½¢	10.33
Shropshire	8	4	2	2	68.9	36.5	52.9	16½¢	11.37
Hampshire	7	4	2	1	74.3	38.3	51.6	16½¢	12.25
Oxford	6	2	2	2	67.8	33.9	49.9	16½¢	11.20
Scrub	11	9	2	--	71.1	37.3	52.6	16½¢	11.72
Seconds									
Southdown	--	--	--	--	----	----	----	----	-----
Shropshire	3	--	2	1	66.2	33.0	49.8	12½¢	8.25
Hampshire	--	--	--	--					
Oxford	2		1	1	61.0	30.0	50.0	12½¢	7.61
Scrub	9	1	3	5	65.1	33.3	51.2	12½¢	8.14

S -- Strictly choice
R -- Good quality
M -- Medium quality

Tables 18, 19 and 20 summarize the classifications of the second shipment of lambs, made on June 9th. This shipment was graded and sold in the same manner as the first. Since it was the final shipment of all the lambs on hand it was a much more uneven lot of lambs. Some of the lambs lacked age and weight to make good market lambs. The first shipment was a better criterion as to the rank of the various breeds for early spring lamb production.

Table 18. Market Grading on Foot, Second Shipment.

	Number				Total weight at Station Farm				Average weight			
	Prime	Good	Seconds	Culls	Prime Lbs	Good Lbs	Seconds Lbs	Culls Lbs	Prime Lbs	Good Lbs	Seconds Lbs	Cull Lbs
Southdown	6	3	3	--	476	192	171	--	79.2	64.0	57.0	--
Shropshire	2	5	11	6	139	371	678	231	69.5	74.2	61.6	38.5
Hampshire	1	1	10	1	63	83	586	48	63.0	83.0	58.6	48.0
Oxford	4	7	4	4	333	549	278	178	83.3	78.4	69.5	44.5
Scrub	-	3	5	12	---	249	361	571	----	83.0	72.2	47.6
	13	19	33	23	1011	1444	2074	1028				
Weight at Nashville					937	1350	1851	952				
Shrink barn weights to Nashville					74	94	223	76				
Av. Shrink barn weights to Nashville					5.7	4.9	6.8	3.3				

Table 19 Analysis of Slaughter Data of Shipment June 9, 1922

Lambs grading as S.	No.	Av. live weight Lbs.	Av. dressed weight Lbs.		Av. per cwt. dressed
Southdown	10	69.3	34.8		50.3
Shropshire	7	71.3	34.9		48.9
Hampshire	5	61.6	32.0		51.9
Oxford	10	78.0	38.4		49.3
Scrub	2	80.0	40.0		50.0
				Average	49.8
Lambs grading as R.					
Southdown	1	88.0	48.0		54.5
Shropshire	9	63.8	29.5		46.3
Hampshire	6	62.3	29.5		47.4
Oxford	5	76.0	33.8		44.6
Scrub	6	79.0	39.3		49.8
				Average	47.4
Lambs grading as M.					
Southdown	1	58.0	25.0		43.1
Shropshire	2	59.5	24.5		40.8
Hampshire	1	50.0	26.0		52.1
Oxford	2	44.0	22.0		50.0
Scrub	6	48.2	22.7		47.1
				Average	46.5
Lambs grading as X or XX					
Southdown	--	----	----		----
Shropshire	6	38.0	15.8		41.6
Hampshire	1	48.0	20.0		41.6
Oxford	2	45.0	19.5		43.3
Scrub	6	43.-	18.7		43.4
				Average	42.6

Table 20 Summary of Second Shipment

	No. marketed	Total weight Lbs.	Av. wt. Lbs.	Total amount received	Av. market value perhead	Av. days old	Av. daily gain Lbs.
Southdown	12	839	69.6	$104.13	$8.69	108	.64
Shropshire	24	1419	59.0	138.64	5.78	101	.58
Hampshire	13	780	60.0	74.23	5.71	91	.65
Oxford	19	1338	70.4	148.88	7.84	112	.62
Scrub	20	1181	59.1	92.79	4.64	107	.62

Fig. 13. Scrub Ram Used 1921-22.

Fig. 14. Scrub Ram Used 1921-22.

Regarding the second shipment of lambs there was not much to be said of any breed as being better than any other when ages and weights of the lambs were considered, except that the Scrub lambs ranked lowest. They were but an average of one day younger than the Southdowns and sold for but 52 per cent as much. Also 60 per cent of their carcasses graded in the M grade or below.

The data for both shipments have been combined and are presented in the following Table 21, in order to show the average results of all the data relating to the influence of the breed of the sire of the lambs.

Table 21. Summary of Lambs Marketed of Each Breed, Both Shipments.

Group	Breed of sire	Total lambs	Av. age of each lamb	No. twin lambs	No. single lambs	Av. daily gain of each lamb	*Av. wt. of lambs of each breed	Av. dressing percentage	Per cent average of lamb carcass grading as S	Price rec'd per head
			Days			Lbs.	Lbs.			
I	Southdown	28	104	17	11	.67	69.2	51.8	85.6	$10.61
II	Shropshire	54	102	40	14	.66	67.2	50.0	51.9	9.58
III	Hampshire	40	97	25	16	.75	73.1	51.4	50.0	11.40
IV	Oxford	39	105	23	15	.69	72.9	49.3	53.8	10.33
V	Scrub	44	98	31	13	.68	65.5	50.4	27.3	8.09

*Birth weight included.

The Hampshire lambs, during the year 1921-22, ranked first in the rate of gain per day, the average weight of lambs marketed, and the price received per lamb marketed, and second in dressing percentage. Southdowns ranked second in price received per head, first in dressing percentage, and third in size. It is well to note, however, that the differences in these various factors with lambs sired by purebred rams are not great, but that there is a marked depreciation in value of lambs sired by scrub rams. The average received per lamb for all sired by purebred rams was $10.40, while Scrub lambs averaged but $8.09 each, making a difference of $2.31. Had Group V ewe flock been headed by a ram of one of the Down breeds tested, the returns based on data from the other four flocks would have been $101.64 greater. The lambs sired by the Southdown ram ranked first in the grading of the carcasses, although the ranking individual carcass of the first shipment was sired by a Hampshire ram, and the first carcass of the second shipment by a Shropshire ram.

Fig. 15. Lambs on Crimson Clover May 3, 1922.

Influence of Twinning on Market Returns.

The distribution of twins between the various groups is even enough, and we have sufficient data to make a study of the influence on returns per ewe worth while. Ewes having twins but raising only one of them to market age have been counted as raising single lambs.

Table 22. · Influence of Twinning.

	No. ewes	No. lambs	Total price received	Average price per ewe
Ewes marketing single lambs	79	79	$867.96	$10.98
Ewes marketing two or three lambs	61	125	1161.28	19.09

Ewes that raised two lambs till time for marketing brought in a return of $19.09 each from lambs sold, while ewes that raised but one brought in but $10.98. Two lambs from one ewe sold for $34.58.

SUMMARY OF TWO YEAR'S DATA ON PRODUCTION OF EARLY SPRING LAMBS

1. Influence of Top Crosses of Different Breeds.
2. Comparison of Dark-Faced and White-Faced Ewes.
3. Effect of Condition of Ewes at Breeding Season.
4. Effect of Driving Ewes.

- - - - - - - - - - - -

By

C. A. WILLSON

- - - - - - - - - - - -

1. It seems evident from data collected on 269 ewes that a ewe reaches her maximum production at four to six years. The average number of lambs dropped in 1921 for 3 year ewes was 1.32, for 4 year ewes 1.57, for 5 year ewes 1.39; in 1922 for 3 year ewes 1.50, for 5 year ewes 1.81, and for 7 year ewes 1.68.

2. Common ewes, showing no particular breeding, were less efficient in 1921 than dark-faced ewes showing some blood of the Down breeds, but practically equal in 1922. In 1921 the white-faced ewes dropped an average of 1.24 lambs, in 1922 an average of 1.56, and the dark-faced ewes in 1921 an average of 1.52 lambs and 1.53 lambs in 1922.

3. The average date of lambing for the white-faced ewes was three days earlier in 1921 and seven days earlier in 1922 than the black-faced ewes.

4. Common white-faced ewes raised an average of 62.7 pounds of lamb to market age in 1921 and 100.3 pounds in 1922, the dark-

faced ewes 95.2 pounds in 1921 and 101.1 pounds in 1922.

5. Condition of ewes at the beginning of the breeding season seems to have a marked influence on the usefulness of the ewe for early spring lamb production. Ewes in thin-to-fair condition averaged 1.33 lambs each in 1921 and 1.43 in 1922 while ewes in good condition averaged 1.46 in 1921 and 1.68 in 1922.

6. The average weight of lamb marketed for ewes in thin-to-fair condition was 76.6 pounds and in 1922 was 90.7 pounds. The average for ewes good in condition at the beginning of the breeding season in 1921 was 86.7 pounds and in 1922 was 101.1 pounds. There was a difference of 10 pounds of marketable lamb each year in favor of ewes in good condition at the beginning of the breeding season.

7. Driving ewes for long distances before turning in the rams did not either year cause an earlier production of lambs. Ewes that were driven dropped lambs an average of 10 days later in 1921 and 4 days later in 1922.

8. The average daily gain of lambs of each sex was practically the same. The wether lambs gained .80 pound per day in 1921 and .71 pound in 1922; ewe lambs .79 pound in 1921 and .67 pound in 1922. Apparently the castration of the male lambs did not check their growth.

9. The average birth weight of the lambs seemed but little affected by the breed of the sire. The average for both years was for 69 Southdown lambs 9.67 pounds, for 82 Shropshire lambs 8.77 pounds, for 84 Hampshire lambs 9.18 pounds, for 78 Oxford lambs 9.55 pounds, and for 45 scrub lambs 9.24 pounds.

10. The per cent of lambs grading on foot as prime or fancy selects for both years, grouped according to the breed of the sire, was 64.8 for Southdowns, 46.8 for Shropshires, 58.3 for Hampshires, 42.2 for Oxfords and 9.1 for scrubs.

11. Average gains of individual lambs including both years were nearly proportional to the average size of individuals of the breed of the ram used. The average daily gain of lambs sired by Southdown rams was .70 pound, by Shropshire rams .70 pound, Hampshire rams .78 pound, Oxford rams .74 pound, and scrub rams .67 pound.

12. The average weights at marketing of all lambs including data of both years, according to the breed of the sire, were, for Southdown lambs 68.7 pounds, Shropshire 67.3 pounds, Hampshire 75.8 pounds, Oxford 75.9 pounds, and for scrubs (one year only) 65.4 pounds.

13. The lambs were sold by grade on foot in 1922. The average received for all lambs sired by purebred rams was $10.40, while scrub lambs averaged but $8.09 each. Had the 44 lambs sired by scrub rams been sired by purebred Down rams the returns would have been $101.64 greater.

14. In 1922 the first shipment of lambs sired by Southdown rams sold for $12.10 each, by the Shropshire rams $12.93, by the Hampshire rams $13.99 each, by the Oxford ram $12.89 each, and the scrub rams $10.95 each.

15. In 1922 of the carcasses of the first shipment 87 percent of the lambs sired by Southdown rams graded as strictly choice, 70 percent of the Shropshires, 53 percent of the Hampshires, 67 percent of the Oxfords, and 50 percent of the scrubs.

16. In the first shipment the carcass that ranked first was sired by a Hampshire ram, second by a Southdown ram, and third by a Shropshire ram. In the second shipment the carcass ranking first was sired by a Shropshire ram, second by a Hampshire ram and third by a Southdown ram.

17. There were but small differences in the dressing percentages of the lambs sired by purebred rams.

18. Ewes in 1922 that raised two lambs till time for marketing gave average returns from lambs sold of $19.09, while ewes that raised but one, an average of $10.98. Two lambs from one ewe sold for $34.58.

19. The ewes and lambs both years were kept on rye and crimson clover throughout the winter months and received no grain throughout the year except for about a week as each ewe lambed when they were kept under open shed and fed a little grain and hay.

Acknowledgments.

Of the painstaking and untiring work of Acting-Superintendent C. M. Hume of the Middle Tennessee Experiment Station in the management of the ewe flock; for the expert assistance given each year by Mr. G. L. Watkins, of Watkins, Conithers & C Company, of Nashville, and Mr. C. C. Flanery, Assistant Specialist in Animal Husbandry, University of Tennessee, in the market grading of the lambs on foot; and the co-operation of Armour & Company, of Chicago, through their representative Mr. H. A. Phillips, in the collection of slaughter data, grateful acknowledgment is extended.