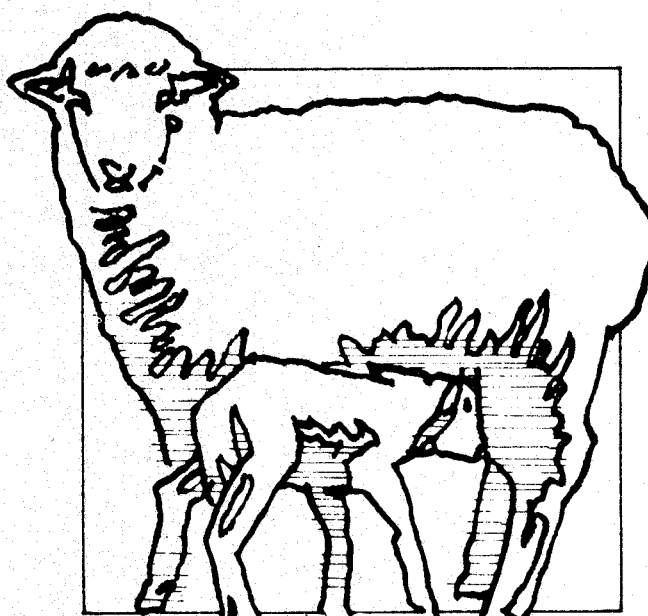# KANSAS
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TABLE OF CONTENTS

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Kansas Sheep Research 1995

PERFORMANCE OF LAMBS SIRED BY RAMBOUILLET, TUNIS, ROMANOV, AND KATAHDIN RAMS--THREE LAMB CROPS

Frank J. Schwulst[1] and Linda C. Martin[2]

Summary

Rambouillet and Rambouillet crossbred ewes were bred to Rambouillet, Tunis, Romanov, and Katahdin rams to produce fall-born F_1 lambs, and their conception rates (%) were 59.6, 69.0, 65.6, and 65.9, respectively. Ewes bred to Romanov rams produced the most (1.53) lambs per ewe lambing. Survival to weaning was highest (92.1%) for Katahdin-sired lambs and lowest for Rambouillet-sired lambs at 74.8%. Preweaning average daily gains were greatest (0.530 lb) for Tunis-sired lambs. Postweaning daily gains were over .6 lb for lambs sired by Katahdin and Rambouillet rams and about .58 lb for those sired by Tunis and Romanov rams.

Experimental Procedures

Rambouillet and Rambouillet crossbred ewes were allotted by age and breed to eight lots with one ram and 30 to 32 ewes per lot. The composition of the ewe population for the first lamb crop was 62% straight Rambouillet, 12% Rambouillet (3/4) x Booroola Menno (1/4), 14% Rambouillet (3/4) x Finn (1/4), and 12% Dorset (1/2) x Rambouillet (1/2). The ewe population varied only slightly from first to third lamb crop. Two different rams of the Rambouillet, Tunis, Romanov, and Katahdin breeds were used to produce each of the lamb crops. Each breeding season extended from May 15 to June 30. The first lamb crop was born during the fall of 1991, the second in 1992, and the third in 1993. Ewe lambs of each F_1 type will be retained in the flock and bred to Suffolk rams to compare reproductive performance and lamb production.

Results

Reported here are raw data from all three lamb crops combined. These data are ready to be analyzed.

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Preweaning data from the three lamb crops combined are shown in Table 1. Conception rate was lowest for the Rambouillet rams among all sire breeds. Conception rates for the Tunis, Romanov, and Katahdin sires were all between 65% and 70% and, based on the record of our flock in general, probably could be considered satisfactory for out-of-season, single-sire matings. Long-term records of the Colby station flock show that about 85% of all ewes exposed to summer breeding have lambed in the following fall. However, when only single-sire matings are considered, that record falls to about 50% conception. Thus, conception rates in this study should not be considered as exceptionally low.

Table 1.   Preweaning Data--Three Lamb Crops

| | Breed of Sire | | | |
Item	Rambouillet	Tunis	Romanov	Katahdin
No. ewes exposed	166	168	163	167
No. ewes lambed	99	116	107	110
% ewes lambed	59.6	69.0	65.6	65.9
No. lambs born	143	160	164	162
% lamb crop	86.1	95.2	100.6	91.0
Lambs/ewe lambing	1.44	1.38	1.53	1.38
No. multiple births	44	43	52	42
% multiple births	44.4	37.1	48.6	38.2
Avg. birth weight (lb)	10.4	10.6	9.3	10.6

Ewes bred to Romanov sires produced a 100.6% lamb crop. Lamb crops for all other sire groups were less than 100%. Differences in lambs born per ewe lambing were small among sire breed groups, averaging around 1.4 to 1.5 lambs per ewe. Ewes bred to Romanov rams gave birth to the most (1.53) lambs per ewe lambing. Thus, the small sizes of lamb crops were functions more of low conception rate than of low prolificacy.

Lamb birth weights were lowest (9.3 lbs) for the lambs sired by Romanov rams. Lambs sired by the other ram breeds all averaged more than 10 lbs at birth. The lower weight of the Romanov-sired lambs probably was influenced by the somewhat higher rate of multiple births from ewes bred to Romanov rams.

Table 2 presents postweaning data for the three lamb crops combined. Survival rate to weaning (50 ± 3 days) was greatest (92.1%) for Katahdin-sired lambs and lowest (74.8%) for Rambouillet-sired lambs. Lambs from ewes bred to Tunis and Romanov rams had preweaning death losses of about 13%. That figure is very close to the overall average for the Colby fall-lambing flock since some of the more prolific breeds have been included.

Table 2. Postweaning Data--Three Lamb Crops

Item	Breed of Sire			
	Rambouillet	Tunis	Romanov	Katahdin
No. lambs weaned	107	139	142	140
% born weaned	74.8	86.9	86.6	92.1
Avg. weaning weight (lb)	35.8	37.5	34.3	34.9
ADG birth-weaning (lb)	0.497	0.530	0.491	0.480
No. lambs marketed	96	130	135	132
% born marketed	67.1	81.3	82.3	86.8
Avg. market weight (lb)	112.5	110.3	110.4	113.0
ADG weaning-market (lb)	0.610	0.584	0.583	0.614

Average daily gains from birth to weaning were about .5lb for all sire groups. Tunis-sired lambs had slight advantages in weaning weight and average daily gain to weaning.

As the lambs approached market weight, they were weighed at 2-week intervals, and lambs weighing 110 lbs or more were sold at a local sale barn. Only small differences in gains from weaning to market occurred among lambs sired by rams of the four breeds. Average daily gains were slightly over .6 lb for Rambouillet- and Katahdin-sired lambs and just under that figure for lambs sired by Tunis and Romanov rams.

Ewe lambs were selected from each lamb crop to form a flock of Ẹewes to be evaluated for out-of-season reproductivity and lamb production. Each group of ewe lambs was shorn at an average age of about 9 months. The fleeces were weighed at the station, bagged separately, and transported to a wool warehouse for quality evaluation. Ewe-lamb wool data for the three lamb crops combined are presented in Table 3. As might be expected, Rambouillet-sired ewe lambs produced the heaviest fleeces with the highest spinning count. Tunis-sired ewe lambs were

Table 3. Ewe-Lamb Wool Data (9 mos.) --Three Lamb Crops

Item	Rambouillet	Tunis	Romanov	Katahdin
No. ewes	39	66	45	69
Fleece weight (lb)	7.8	7.1	5.8	5.3
Staple length (cm)	5.65	5.72	7.35	6.05
Spinning count	60.7	55.2	48.6	50.5
Clean yield (%)	53.2	54.3	55.2	54.8
No. ewes --- hair	----	2/66	37/45	45/69
% ewes --- hair	----	3.0	82.2	65.2
% fleece --- hair	----	6.0	43.4	50.3
No. ewes --- color	----	15/66	6/45	2/69
% ewe --- color	----	22.7	13.3	2.9

intermediate for those traits, and the more hairy fleeces of the Romanov and Katahdin groups were the lowest. Hair fibers were present in about 82% of the fleeces from Romanov-sired lambs and about 65% of the fleeces from the Katahdin group. Fleeces from two of the Tunis-sired ewe lambs contained small amounts of hair. Individual fleeces from the Katahdin group contained more hair per fleece than fleeces from Romanov-sired ewe lambs. Fleeces from Tunis-sired lambs were the most likely to contain colored fibers, followed by those from lambs sired by the Romanov and Katahdin rams. No hair fibers or colored fibers were found in any of the fleeces from Rambouillet-sired ewe lambs.

The data from this phase of the sire-breed project are now complete and ready to be analyzed, The ewe lambs selected each year now form a flock being evaluated for reproductive performance and lamb production in an out-of-season breeding and lambing system. The ewes in that flock are all bred to Suffolk rams. The last F_1 group born in the fall of 1993 are lambing for the first time during the spring of 1995.

Data from lamb crops 1, 2, and 3 are displayed individually in Tables 4-12.

Table 4. Preweaning Data--Lamb Crop 1

| Item | Breed of Sire | | | |
	Rambouillet	Tunis	Romanov	Katahdin
No. ewes exposed	60	58	58	58
No. ewes lambed	47	29	25	30
% ewes lambed	78.3	50.0	43.1	51.7
No. lambs born	67	37	43	43
% lamb crop	111.7	63.8	74.1	74.1
Lambs/ewe lambing	1.43	1.28	1.72	1.43
No. multiple births	20	8	17	13
% multiple births	42.6	27.6	68.0	43.3
Avg.birth weight (lb)	11.2	11.2	9.2	10.3

Table 5. Postweaning Data--Lamb Crop 1

| Item | Breed of Sire | | | |
	Rambouillet	Tunis	Romanov	Katahdin
No. lambs weaned	51	36	36	41
% born weaned	76.1	97.3	83.7	95.3
Avg. weaning weight (lb)	37.7	38.0	35.5	33.2
ADG birth-weaning (lb)	0.526	0.538	0.514	0.456
No. lambs marketed	49	29	33	40
% born marketed	73.1	81.1	76.7	93.0
Avg. market weight (lb)	113.0	110.7	110.8	111.1
ADG weaning-market (lb)	0.619	0.615	0.591	0.631

4

Table 6.   Ewe-Lamb Wool Data (9 mos.)--Lamb Crop 1

Item	Breed of Sire			
	Rambouillet	Tunis	Romanov	Katahdin
Fleece weight (lb)	7.8	6.8	5.3	5.0
Staple length (cm)	6.2	6.4	7.3	5.9
Spinning count	62.4	55.3	48.8	52.4
Clean yield (%)	54.1	54.9	55.2	55.1
No. ewes -- hair	----	----	9/13	8/27
% ewes -- hair	----	----	69.2	29.6
% fleece -- hair	----	----	48.3	42.8
No. ewes -- color	----	4/19	1/13	----
% ewes -- color	----	6.5	3.0	----

Table 7.   Preweaning Data--Lamb Crop 2

Item	Breed of Sire			
	Rambouillet	Tunis	Romanov	Katahdin
No. ewes exposed	60	64	60	63
No. ewes lambed	25	54	45	56
% ewes lambed	41.7	84.4	75.0	88.9
No. lambs born	33	77	62	73
% lamb crop	55.0	120.3	103.3	115.9
Lambs/ewe lambing	1.32	1.43	1.38	1.30
No. multiple births	9	21	17	17
% multiple births	36.0	38.9	37.8	30.4
Avg. birth weight (lb)	10.4	10.6	9.6	11.1

Table 8.   Postweaning Data--Lamb Crop 2

Item	Breed of Sire			
	Rambouillet	Tunis	Romanov	Katahdin
No. lambs weaned	25	68	59	66
% born weaned	75.8	88.3	95.2	90.4
Avg. weaning weight (lb)	38.8	37.6	35.4	37.1
ADG birth-weaning (lb)	0.547	0.532	0.515	0.514
No. lambs marketed	22	64	57	63
% born marketed	66.7	83.1	91.9	86.3
Avg. market weight (lb)	118.0	113.1	110.1	113.0
ADG weaning-market (lb)	0.729	0.609	0.596	0.616

5

Table 9. Ewe-Lamb Wool Data (9 mos.)--Lamb Crop 2

Item	Rambouillet	Tunis	Romanov	Katahdin
No. ewes	7	37	22	32
Fleece weight (lb)	8.5	7.5	6.1	5.7
Staple length (cm)	4.6	5.5	7.5	6.5
Spinning count	61.4	55.4	48.5	48.3
Clean yield (%)	50.3	54.1	55.1	54.6
No. ewes --- hair	-----	2/37	18/22	32/32
% ewes --- hair	-----	5.4	81.8	100.0
% fleece --- hair	-----	6.0	41.4	54.6
No. ewes --- color	-----	9/37	4/22	2/32
% ewes --- color	-----	24.3	18.2	6.3

Table 10. Preweaning Data--Lamb Crop 3

Item	Breed of Sire			
	Rambouillet	Tunis	Romanov	Katahdin
No. ewes exposed	46	46	45	46
No. ewes lambed	27	33	38	24
% ewes lambed	58.7	71.7	84.4	52.2
No. lambs born	42	47	59	36
% lamb crop	91.3	102.2	131.1	78.3
Lambs/ewe lambing	1.56	1.42	1.55	1.50
No. multiple births	15	14	18	12
%. multiple births	55.6	42.4	47.4	50.0
Avg. birth weight (lb)	9.3	9.9	9.0	10.0

Table 11. Postweaning Data--Lamb Crop 3

Item	Breed of Sire			
	Rambouillet	Tunis	Romanov	Katahdin
No. lambs weaned	31	36	47	33
% born weaned	73.8	76.6	79.7	91.7
Avg. weaning weight (lb)	30.2	35.7	32.0	32.7
ADG birth-weaning (lb)	0.409	0.502	0.457	0.444
No. lambs marketed	26	35	45	29
% born marketed	61.9	74.5	76.3	80.6
Avg. market weight (lb)	106.9	109.8	110.4	115.4
ADG weaning-market (lb)	0.506	0.548	0.559	0.589

Table 12.   Ewe-Lamb Wool Data (9 mos.)--Lamb Crop 3

Item	Rambouillet	Tunis	Romanov	Katahdin
No. ewes	10	10	10	10
Fleece weight (lb)	7.5	6.1	6.0	4.7
Staple length (cm)	5.21	5.40	7.00	5.08
Spinning count	56.6	54.4	48.6	52.2
Clean yield (%)	53.4	54.0	55.3	54.5
No. ewes --- hair	- - - -	- - - -	10/10	5/10
% ewes --- hair	- - - -	- - - -	100.0	50.0
% fleece --- hair	- - - -	- - - -	42.5	35.0
No. ewes --- color	- - - -	2/10	1/10	- - - -
% ewes --- color	- - - -	20.0	10.0	- - - -
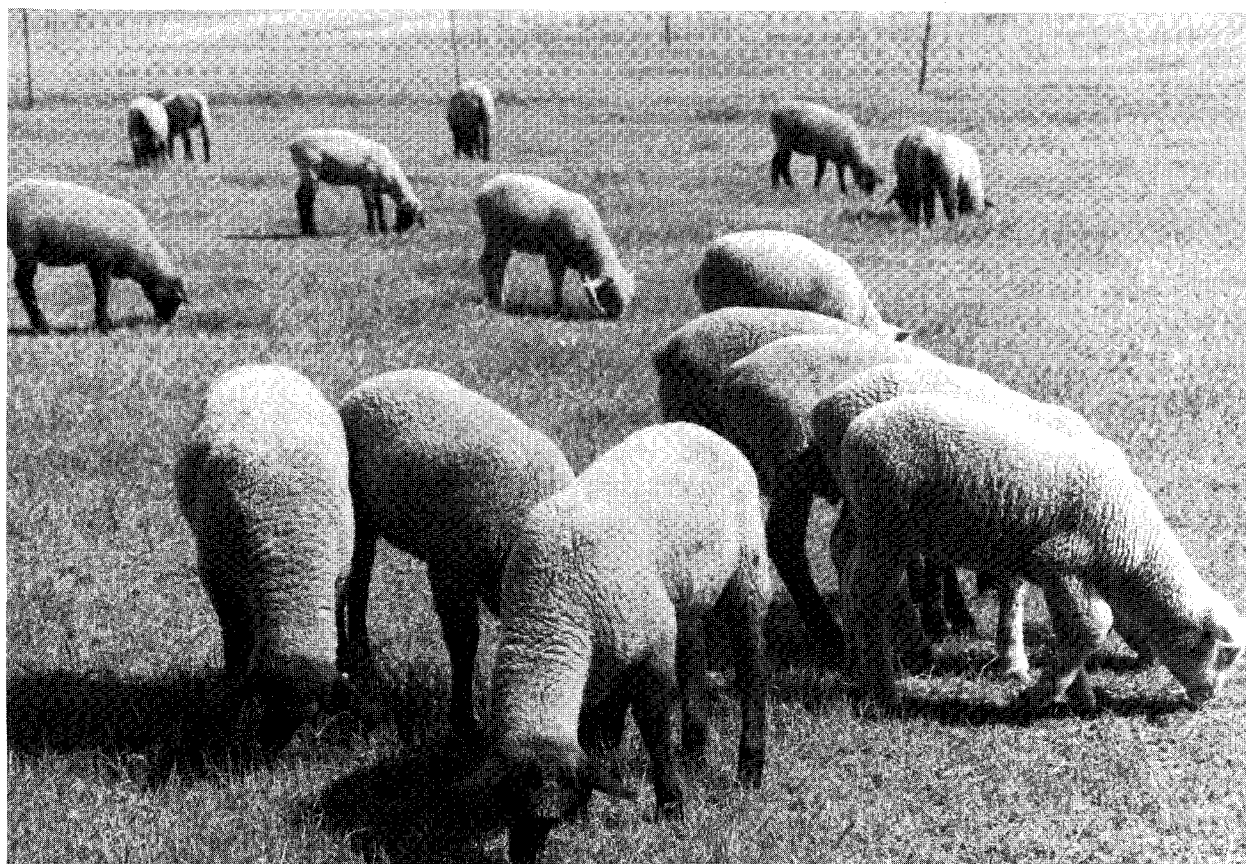
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THE RELATIONSHIPS OF LAMB GROWTH TRAITS TO THE PRODUCTION TEST PERFORMANCE OF THEIR SIRES

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Summary

Suffolk rams that were high-ranking and low-ranking in a ram-lamb growth performance trial were bred to genetically similar sets of ewes. Ram ranking did not affect conception rate. Ewes bred to high-ranking rams produced more pounds of lamb per ewe exposed at birth, weaning, and market. Ewe age had a greater effect on conception rate and lamb production per ewe exposed than either ram ranking or ewe breed.

Experimental Procedures

The objective of this study was to evaluate the growth performance of lambs sired by rams that ranked high or low in a ram-lamb growth performance trial. We also evaluated the reproductive performance of ewes bred to the high- or low-ranking rams.

Four Suffolk rams were obtained each year (1990- 1992) from Colby Community College. The rams all had completed a ram-lamb performance test for growth to an endpoint of .25 in. of backfat. The rams entered the trial as 60-to 90-day-old lambs. We obtained two top-ranking and two bottom-ranking rams each year. The rams were transferred to the experiment station flock about 1 month before breeding was initiated. Each year, the rams were bred to four genetically similar groups of ewes.

The ewes used in this trial were from a flock that resulted from a rotational crossing system. Suffolk, Dorset, and Finn x Rambouillet rams were used to produce the ewes. The ewes ranged in age from 3 to 8 years during the course of the study.

The 30-day breeding season occurred during September of each year. Lambing took place during the last week of January and the month of February of the next year. Thus, 1990 ram-test rams sired lambs born during the late winter of 1991, and so forth.

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Male lambs were castrated using elastrator bands at about 7 to 10 days of age, and all lambs were docked at that time using an emasculator. All lambs were weaned and weighed at 50 ± 3 days. As the lambs approached market size, they were weighed at 2-week intervals and marketed after reaching 110 lbs of weight. Backfat thickness was estimated by human evaluation just before the lambs were sold at auction in a local sale barn.

Ewe-reproductive and lamb-production data are presented here. The lamb data were analyzed on the basis of lambs born, weaned, and marketed per ewe exposed to breeding. Further analyses, not yet completed, will be based on lambs weaned and marketed per ewe lambed and also will evaluate the growth performance of the lambs.

Results

Table 1 displays ewe-reproductive data based on the number of ewes exposed. Conception rates were very nearly equal for ewes bred to high-growth-rate or low-growth-rate rams. Suffolk-sired ewes were more likely to become pregnant (95.0%) compared with 88.2% for Finn x Rambouillet-sired ewes and 87.2% for Dorset-sired ewes. These conception rates were generally acceptable for fall-bred and spring-lambing ewes. Conception rates declined steadily after the ewes reached 5 years of age. The 3-year-old and 4-year-old ewes had only one open ewe per group, giving a conception rate of 97.7% for each group. Conception rate dropped by 4.6% in 5-year-old ewes and continued to decrease until reaching 83.9% for 8-year-old ewes. Thus, ewe breed and ewe age apparently had more effect on the conception rate than the lamb growth performance of the rams to which the ewes were mated.

Table 1. Conception Rates for Ewes Bred to High-Ranking or Low-Ranking Rams from a Ram Growth Test Trial

Item	No. Ewes Pregnant	No. Ewes Open	% Pregnant
Ram Ranking			
High	149	15	90.9
Low	148	18	89.2
Ewe Breed			
Suffolk-sired	95	5	95.0
Dorset-sired	82	12	87.2
F x R*-sired	120	16	88.2
Ewe Age			
3 years	42	1	97.7
4 years	43	1	97.7
5 years	54	4	93.1
6 years	60	9	87.0
7 years	51	9	85.0
8 years	47	9	83.9

*Finn x Rambouillet rams

Data describing the pounds of lamb born, weaned, and marketed per ewe exposed to breeding are shown in Table 2. Although ram ranking did not have a significant effect on the pounds of lamb born, weaned, and marketed, the high-ranked rams did have an advantage at each point. By the time the lambs were marketed, the weight advantage was 14.7 lbs per ewe exposed. Though not statistically significant, that advantage probably would be economically significant. If lambs were priced at 60¢ per lb, the 14.7-lb advantage would be worth $8.82 per ewe exposed.

Table 2. Pounds of Lamb Born, Weaned, and Marketed per Ewe Exposed

Item	Born	Weaned	Marketed
Ram Ranking			
High	17.0	51.4	143.1
Low	16.5	48.2	128.4
Ewe Breed			
Suffolk-sired	17.4	51.4	137.5
Dorset-sired	15.7	48.5	127.7
F x R*-sired	17.2	49.6	142.7
Ewe Age			
3 years	16.4[a]	51.5[ab]	143.8[ab]
4 years	19.5[b]	56.2[a]	144.2[ab]
5 years	17.5[ab]	59.3[a]	163.2[a]
6 years	16.5[a]	50.0[ab]	135.8[ab]
7 years	15.1[a]	42.1[bc]	116.4[b]
8 years	15.5[a]	39.8[c]	112.3[b]

*Finn x Rambouillet rams
[ab]Means in the same column with different superscripts differ (P < .05).

Suffolk-sired ewes and Finn x Rambouillet-sired ewes produced more pounds of lamb per ewe exposed at birth, weaning, and market than did Dorset-sired ewes. Four-year-old ewes gave birth to the most pounds of lamb per ewe; however, by weaning and at market, the 5-year-old ewes were the leaders. The advantages in total pounds of lamb weaned by 5-year-old ewes were 3.1 lbs over the 4-year-old group and ranged to a high of 19.5 lbs over the 8-year-old ewes. When the lambs were marketed, the advantages for the 5-year-old ewes were 19 lbs over 4-year-old ewes and 50.9 lbs over the oldest ewes.