

Sheep

A Preliminary Evaluation of Reproductive Performance and Further Evaluation of Growth and Carcass Characteristics of 1/4 Finish Landrace Lambs

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Story in Brief

A great deal of thought and effort has been expended to find a ewe that under Oklahoma conditions will produce and rear as many good growthy lambs as possible in her lifetime. In a further attempt to find this ewe the first replicate of some experimental ewe lambs were born at Fort Reno in the spring of 1971, and a second replicate was born in the spring of 1972.

There are five different breed combinations that will be evaluated over a 7 year period to compare them for suitability as commercial ewes under Oklahoma conditions. The breeding combinations consist of: (1) 1/2 Dorset X 1/2 Rambouillet (control ewes), (2) 1/4 Finnish Landrace-1/4 Dorset X 1/2 Rambouillet, (3) 1/4 Finnish Landrace-1/4 Rambouillet X 1/2 Dorset, (4) 1/4 Dorset X 3/4 Rambouillet and (5) 1/4 Finnish Landrace X 3/4 Rambouillet (born in 1972 only).

In both years the 1/4 Finnish Landrace-1/4 Rambouillet X 1/2 Dorset lambs averaged about one pound lighter at birth than the other groups. All groups were similar in rates of gain to weaning at 70 days of age and in 70-day weights. The 1/4 Dorset X 3/4 Rambouillet lambs outgained all other groups on post weaning rate of gain (.53 lbs./day vs. approximately .48 lbs./day for other breed combinations). The 1/4 Dorset X 3/4 Rambouillet also had a greater average daily gain from birth to market (.55 lbs./day) than the other groups of lambs (approximately .51 lbs./day).

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From two to six wethers from each of the five breed combinations were slaughtered at the Oklahoma State University meat lab. Generally there were no differences due to Finnsheep breeding in the loin eye area, backfat thicknesses or quality grades. In both years the Finnsheep groups had dressing percentages about 3 percent lower than the Dorset X Rambouillet groups.

The ewe lambs born in 1971 were mated at 7 months of age to lamb at 12 months of age. The ewes of $\frac{1}{4}$ Finnish Landrace breeding averaged 25 percent more ewes conceiving with slightly more lambs born per ewe lambing (1.28 and 1.10 lambs/ewe vs. 1.05 and 1.00 lambs/ewe for the Dorset X Rambouillet groups).

Introduction

One of the main areas of sheep production that can be vastly improved is lamb production per ewe. This can be accomplished by increasing the number of lambs born per ewe lambing (lamb crop percent) or by shortening the interval between lambings for each ewe (lamb more than once a year). Research at Fort Reno over the past years has shown that the $\frac{1}{2}$ Dorset X $\frac{1}{2}$ Rambouillet ewe was superior in reproductive rate to the straightbred Dorset or straightbred Rambouillet on the basis of spring breeding and in twice-yearly lambing programs. The Rambouillet breed has been used because it is an out-of-season breeding sheep, and one of the most widely available western ewes. The Dorset was used because it also is an out-of-season breeding sheep and is prolific.

A source of new germ plasm is now available for use, the Finnish Landrace. The Finnish Landrace breed (Finn-sheep) is a medium size sheep somewhat deficient in wool production (a coarse wool) and muscling, but is well known for its outstanding prolificacy (often 4-5 lambs in a litter).

The Finnsheep originate in a cold climate very different from Oklahoma conditions and at present purebred Finnish Landrace rams are not available for widespread use. Rams of $\frac{1}{2}$ Finnish Landrace breeding are much more available. Therefore, in 1970 a long range program was initiated at the Fort Reno Livestock Station to determine if a ewe of $\frac{1}{4}$ Finnish Landrace germ plasm could adapt to Oklahoma conditions and improve reproductive rates over the present recommended ewe breed cross. Since the $\frac{1}{2}$ Dorset X $\frac{1}{2}$ Rambouillet ewe turned out to be such a good ewe for Oklahoma commercial operations the $\frac{1}{4}$ Dorset X $\frac{3}{4}$ Rambouillet will also be tested in this project.

These results summarize comparisons of breed groups for birth weights, lamb growth performance (castrate males only), lamb mortality, a few major carcass characteristics and the first season's reproductive

performance of the first replicate of ewe lambs. The program is not far enough along to get data from the offspring of the test ewes, therefore data collected and discussed are on the ewes themselves and their male sibs.

Materials and Methods

During 1970 and 1971 planned matings were made to produce test ewes of the desired breed crosses. The test ewes were born in two replicates, the first replicate in the spring of 1971 and the second replicate in the spring of 1972. The breed crosses to be tested are $\frac{1}{2}$ Dorset X $\frac{1}{2}$ Rambouillet (control group), $\frac{1}{4}$ Dorset X $\frac{3}{4}$ Rambouillet, $\frac{1}{4}$ Finnish Landrace— $\frac{1}{4}$ Dorset X $\frac{1}{2}$ Rambouillet, $\frac{1}{4}$ Finnish Landrace— $\frac{1}{4}$ Rambouillet X $\frac{1}{2}$ Dorset and $\frac{1}{4}$ Finnish Landrace X $\frac{3}{4}$ Rambouillet. The number of test ewes produced per year are shown in Table 1 along with the crosses used to produce the test ewes.

Management practices were the normal practices maintained at Fort Reno and were the same for all breeds of lambs. Lambs were born in the lot and then placed in lambing pens with their mother for 3 to 4 days. At this time lamb data was collected. All lambs had access to creep feed. The creep feed consisted of five percent molasses, 55 percent cracked milo, ten percent soybean meal and 30 percent ground alfalfa hay.

Table 1. The Breed Crosses Used to Produce the Test Ewes and the Number Kept for Testing Each Year¹

Group	Breeding of Test Ewes	Test Ewe Sire Breed	Test Ewe Dam Breed	Number Born	
				1971	1972
1	$\frac{1}{2}$ Dorset X $\frac{1}{2}$ Ramb. (Control)	Dorset	Rambouillet	26	24
2	$\frac{1}{4}$ Dorset X $\frac{3}{4}$ Ramb.	Rambouillet	$\frac{1}{2}$ Dorset X $\frac{1}{2}$ Ramb.	28	24
3	$\frac{1}{4}$ Finn X $\frac{3}{4}$ Ramb.	$\frac{1}{2}$ Finn X $\frac{1}{2}$ Ramb.	Rambouillet	0	41
4	$\frac{1}{4}$ Finn- $\frac{1}{4}$ Dorset X $\frac{1}{2}$ Ramb. ²	a. $\frac{1}{2}$ Finn X $\frac{1}{2}$ Dorset b. $\frac{1}{2}$ Finn X $\frac{1}{2}$ Ramb.	Rambouillet $\frac{1}{2}$ Dorset X $\frac{1}{2}$ Ramb.	22	29
5	$\frac{1}{4}$ Finn- $\frac{1}{4}$ Ramb. X $\frac{1}{2}$ Dorset ²	a. $\frac{1}{2}$ Finn X $\frac{1}{2}$ Ramb. b. $\frac{1}{2}$ Finn X $\frac{1}{2}$ Dorset	Dorset $\frac{1}{2}$ Dorset X $\frac{1}{2}$ Ramb.	23	23

¹ The $\frac{1}{4}$ Finnish Landrace X $\frac{3}{4}$ Rambouillet ewe lambs were born in 1972 only.

² These breed crosses were produced by two different matings (a and b).

Starting when the oldest lambs reached 30 pounds, the lambs were all weighed biweekly. The lambs were weaned at approximately ten weeks of age and placed in a drylot feed area at the Fort Reno station. When the youngest lambs reached twelve weeks of age the soybean meal was removed from the creep ration and replaced with ground alfalfa hay. Due to the problem of internal parasites in springborn lambs, the lambs were never allowed out of the drylot area until final removal.

Ewe lambs that were saved as test ewes were removed from the drylot when they weighed 75 pounds on the biweekly weighings and placed on clean pasture. Therefore, the ewe lambs were not used in calculating post weaning rates of gain and overall average daily gains. They were bred at 7 months of age to compare their rates of sexual maturity since this is the first reproductive trait that these ewes will be compared for in the lang range project. The wethers were fed until they weighed 95 pounds or more and shipped to market. Some of the wether lambs were used for the carcass data given in this study.

In 1971, 43 wether lambs were sold for nutrition work at weaning time and, therefore, were only used in calculating birth weights, pre-weaning rate of gain and 70-day weights.

Results and Discussion

Death Losses

Death losses have been divided into two different categories; early death losses (before two weeks of age) and lambs that died between two weeks of age and market. Any deaths that occurred after 2 weeks of age were attributed mostly to chance and not breeding, therefore, only early death losses were reported here (Table 2). The ewes used to produce these lambs were young (4 and 5 years old) Rambouillet ewes and old Rambouillet, Dorset and $\frac{1}{2}$ Dorset X $\frac{1}{2}$ Rambouillet ewes (8-10 year old). Some lamb losses occurred because some old ewes did not give enough milk.

In 1971 the lambs of $\frac{1}{4}$ Finn breeding averaged about 6 percent higher death losses than lambs of the two Dorset X Rambouillet breed groups. The 1972 lambs of $\frac{1}{4}$ Finn- $\frac{1}{4}$ Rambouillet X $\frac{1}{2}$ Dorset breeding had very high early death losses of 26.6 percent while the $\frac{1}{4}$ Dorset X $\frac{3}{4}$ Rambouillet, $\frac{1}{2}$ Dorset X $\frac{1}{2}$ Rambouillet and $\frac{1}{4}$ Finn- $\frac{1}{4}$ Dorset X $\frac{1}{2}$ Rambouillet all had very similar early death losses of 13-17 percent. The $\frac{1}{4}$ Finn X $\frac{3}{4}$ Rambouillet lambs had the lowest death loss percentage (8.4).

When using older ewes there normally is a fairly high incidence of twins but quite regularly the ewe will not produce much milk, which

Table 2. The Number of Lambs Born and Early Death Losses¹ for the Breed Groups During the Two Years Test Ewes Were Being Produced

Breed Components	1971		1972	
	No. of Lambs Born	Early Death Losses (%) ¹	No. of Lambs Born	Early Death Losses (%) ¹
1/2 Dorset X 1/2 Ramb.	77	11.7	51	13.7
1/4 Dorset X 3/4 Ramb.	51	5.9	46	17.4
1/4 Finn-1/4 Dorset X 1/2 Ramb.	74	16.2	98	13.3
1/4 Finn-1/4 Ramb. X 1/2 Dorset	67	14.9	64	26.6
1/4 Finn X 3/4 Ramb.	0	0	119	8.4

¹ Death before 2 weeks of age including stillborn lambs.

results in high death losses among the young lambs. The 1/4 Finn-1/4 Rambouillet X 1/2 Dorset lambs were all produced from old ewes (as were the 1/4 Dorset X 3/4 Rambouillet ewes) and this may be a big factor in the very high 26.6 percent death loss of those lambs. The 1/4 Finn X 3/4 Rambouillet lambs were mostly offspring from the young Rambouillet ewes that generally did not have any problem producing milk. These ewes also produced fewer sets of twins than the older ewes. These two factors are most likely the reasons for the low (8.4%) death losses among the 1/4 Finn X 3/4 Rambouillet lambs.

The overall differences across both years are not significant; however, there does seem to be a trend for the Finnsheep to have slightly higher early death losses.

Lamb Growth Performance

The lambs from each group were evaluated over two years on the growth performance by comparing them for birth weight, rate of gain from birth to weaning, 70-day weight, post weaning rate of gain and average daily gain from birth to market (Table 3).

The 1/4 Finn lambs in 1971 were lighter at birth (8.0 pounds and 8.8 pounds) than the Dorset X Rambouillet groups (9.2 and 9.6 pounds). In 1972, the 1/4 Finn-1/4 Rambouillet X 1/2 Dorset were again lighter than the other groups (8.8 pounds) with the two Dorset X Rambouillet groups being fairly equal again (9.4 and 9.3 pounds). However, the 1/4 Finn-1/4 Dorset X 1/2 Rambouillet lambs were heavier at 9.7 pounds and the 1/4 Finn X 3/4 Rambouillet lambs averaged 10.0 pounds at birth. The 1/4 Finn X 3/4 Rambouillet lambs were produced mostly from the

Table 3. Birth Weights and Mean Growth Performance of the Springborn Lambs

Measurement	1971				1972				
	1/2 D- 1/2 R	1/4 D- 3/4 R	1/4 F-1/4 D-1/2 R	1/4 F-1/4 R- 1/2 D	1/2 D- 1/2 R	1/4 D- 3/4 R	1/4 F-1/4 D-1/2 R	1/4 F-1/4 R-1/2 D	1/4 F- 3/4 R
Birth Weight	9.2	9.6	8.8	8.0	9.4	9.3	9.7	8.8	10.0
Rate of gain to 70 days	.60	.59	.61	.59	.58	.56	.52	.54	.57
70-day weights	51.2	50.9	51.5	49.3	50.0	48.5	48.5	46.6	49.6
Rate of gain from 70 days to mkt. (lbs/day) ^{1,2}	.51	.58	.52	.49	.41	.44	.43	.40	.41
Av. daily gain from birth to mkt. (lbs/day) ^{1,2}	.56	.59	.57	.54	.49	.50	.47	.47	.49
No. of lambs used to calculate avg. daily gain ^{1,2}	54	29	55	50	22	14	38	21	54

¹Ewe lambs were not used for post weaning rate of gain or average daily gain.

²43 wethers were sold at weaning time in 1971.

young Rambouillet ewes. They are very large ewes.

Across the two years (1972 only for the $\frac{1}{4}$ Finn X $\frac{3}{4}$ Rambouillet) the $\frac{1}{4}$ Finn- $\frac{1}{4}$ Rambouillet X $\frac{1}{2}$ Dorset lambs averaged significantly lighter birth weights than the three other breeds with the $\frac{1}{4}$ Finn X $\frac{3}{4}$ Rambouillet heaviest of all. The increased Rambouillet breeding seems to increase birth weights slightly. This is partly due to the fact that most of the Rambouillet ewes used to produce test ewes were young ewes (4-5 years old) while the $\frac{1}{2}$ Dorset X $\frac{1}{2}$ Rambouillet and Dorset ewes were all old ewes (8-10 years old).

Within each of the two years and averaging across both years all five groups compared favorably on pre-70 day rate of gain and 70-day weights. The $\frac{1}{4}$ Dorset X $\frac{3}{4}$ Rambouillet lambs in 1971 had the fastest rate of gain from 70 days to market (.58 lbs./day) with all other groups being similar (.51 lbs./day). In 1972 all five groups gained very similarly and quite slowly (.40 lbs./day to .44 lbs./day). The ranking of breeds for fastest to slowest post-weaning rates of gain did not change from 1971 to 1972 even though they were very similar in 1972 (Table 3). The slow post-weaning rates of gain and average daily gains in 1972 were due to a hot summer and poor alfalfa for the creep ration.

Reproductive Performance

The ewe lambs that were born in the spring of 1971 (four of the five breed combinations) were mated during the fall at about seven months of age to produce lambs at 12 months of age. Their reproductive performance is shown in Table 4.

Only one of the 45 ewes with Finnsheep breeding did not mate at all while 7 out of the 54 Dorset X Rambouillet ewes did not mate at 7 months of age (4 out of the 7 were control ewes). The ewe lambs of $\frac{1}{4}$ Finn breeding averaged 25 percent more ewes conceiving at seven months of age to lamb as yearlings than the Dorset X Rambouillet crosses (81.8% and 91.3%) of those available to be mated and conceive

Table 4. Lambing and Mating Performance of the First Replicate of Ewes

Ewe Breeding	No. Avail.	Ewes Not Mated	Ewes that Lambled		Lambing Rate		Avg. Conc. Age
			No.	%	No.	%	
$\frac{1}{2}$ Dorset X $\frac{1}{2}$ Ramb. (control)	26	4	19	73	20	105	229.3
$\frac{1}{4}$ Dorset X $\frac{3}{4}$ Ramb.	28	3	14	50	14	100	226.4
$\frac{1}{4}$ Finn- $\frac{1}{4}$ Dorset X $\frac{1}{2}$ Ramb.	22	1	18	82	23	128	216.4
$\frac{1}{4}$ Finn- $\frac{1}{4}$ Ramb. X $\frac{1}{2}$ Dorset	23	0	21	91	23	110	224.7

vs. 73.1% and 50.0%). Only 50% of the $\frac{1}{4}$ Dorset X $\frac{3}{4}$ Rambouillet ewe lambs that were exposed to rams actually lambed.

Of those ewes that did lamb the $\frac{1}{4}$ Finn- $\frac{1}{4}$ Dorset X $\frac{1}{2}$ Rambouillet ewes averaged more lambs per ewe lambing than the other three breed groups (1.28 lambs per ewe vs. 1.10, 1.05 and 1.00 lambs per ewe). The $\frac{1}{4}$ Finn- $\frac{1}{4}$ Dorset X $\frac{1}{2}$ Rambouillet ewes also conceived about 10 days sooner (216 days of age) than the other three breed groups, all of which were approximately equal (226 days of age). These data show that the $\frac{1}{4}$ Finn breeding may help the producer to get more lambs from young ewes if he mates them at seven months of age. More data will be available next year to add to our information on this subject.

Carcass Characteristics

In 1971, 24 wethers of three of the breeds were slaughtered to test carcass merit. Twenty-one more lambs (at least two of each breed cross) were slaughtered in 1972 and the carcass characteristics were measured. All lambs for both years were cut and evaluated for carcass weights, loin eye area, backfat thickness, quality grade, leg conformation grade, cutability and dressing percent. (Table 5). During both years the lambs to be slaughtered were held over too long after they should have been sent to slaughter and were too fat.

There were no great differences in either year or over both years in the loin eye area or cutability. In 1971 the Finnsheep groups had lower quality grades and leg conformation grades than the $\frac{1}{2}$ Dorset X $\frac{1}{2}$ Rambouillet lambs, however, in 1972 the three Finnsheep groups had quality grades higher than the Dorset X Rambouillet groups and were equal on leg conformation grades (except the $\frac{1}{4}$ Finn X $\frac{3}{4}$ Rambouillet were one grade point lower).

Rankings on backfat thickness changed drastically from one year to the next, but there is a trend for lambs of increasing Rambouillet breeding to have less backfat on their carcasses.

The two Finnsheep groups in 1971 had lower dressing percentage (about 3%) than the $\frac{1}{2}$ Dorset X $\frac{1}{2}$ Rambouillet and in 1972 the ranking was the same but the $\frac{1}{4}$ Finn- $\frac{1}{4}$ Rambouillet X $\frac{1}{2}$ Dorset lambs were about equal to the $\frac{1}{2}$ Dorset X $\frac{1}{2}$ Rambouillet (57.0% vs. 58.3%). Dressing percentages were quite high in 1972 partly because of fat carcasses when they were held too long before slaughter.

Table 5. Mean Comparisons for Slaughter Measurements

Measurement	Mean							
	1971			1972				
	1/2 D- 1/2 R	1/4 F-1/4 D- 1/2 R	1/4 F-1/4 R- 1/2 D	1/2 D- 1/2 R	1/4 F-1/4 D- 1/2 D	1/4 F-1/4 R 1/2 D	1/4 D- 3/4 R	1/4 F- 3/4 R
No. of lambs	8	8	8	3	5	5	6	2
Live wt. at Fort Reno (lbs) ¹	98.8	96.4	98.4	84.0	96.6	95.8	95.3	98.0
Chilled carcass weight (lbs)	49.7	46.0	47.9	49.0	51.9	54.6	50.7	55.8
Dressing percent	50.3	47.9	48.8	58.3	53.7	57.0	53.2	56.3
Cutability	42.8	43.0	43.5	43.5	43.2	43.0	43.9	44.3
Carcass quality grade ²	12.6	11.5	12.1	11.3	11.6	12.6	11.7	11.0
Leg conformation grade	13.3	11.4	12.8	10.7	10.8	10.8	9.8	10.5
Loin eye area	2.08	1.90	2.06	1.96	1.96	2.07	1.90	2.12
Backfat thickness	.32	.27	.29	.30	.31	.32	.24	.26

¹ Sheared weight.² Grade code is on a scale of 1 to 15, 11 being average choice, 12 high choice and 13 low prime.