

Lambing Performance of Crossbred Ewes of Finnsheep Dorset and Rambouillet Breeding Under Two Cycles of an Accelerated Lambing Program

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Story in Brief

Reproductive performance of 7- and 8-year-old crossbred ewes representing five combinations of Finnsheep (F), Dorset (D) and Rambouillet (R) breeding were evaluated under two cycles of accelerated lambing or lambing every 8 months. The five breed combinations represented were $\frac{1}{2}D\frac{1}{2}R$; $\frac{1}{4}D\frac{3}{4}R$; $\frac{1}{4}F\frac{1}{2}D\frac{1}{4}R$; $\frac{1}{4}F\frac{1}{4}D\frac{1}{2}R$ and $\frac{1}{4}F\frac{3}{4}R$.

Under both cycles of accelerated lambing, lambs per ewe exposed for all ewes per year was 1.88. Ewes of $\frac{1}{2}D\frac{1}{2}R$ breeding showed 1.95 lambs born per ewe exposed per year compared to 1.89 for $\frac{1}{4}F$ ewes and 1.73 for $\frac{1}{4}D\frac{3}{4}R$ ewes in the first cycle. In the second cycle, however, ewes of $\frac{1}{4}F$ breeding showed 1.97 lambs born per ewe exposed per year compared to 1.88 for $\frac{1}{2}D\frac{1}{2}R$ ewes and 1.67 for $\frac{1}{4}D\frac{3}{4}R$ ewes. Lambs born per ewe lambing averaged 1.6 in the two cycles. For $\frac{1}{4}F$ it was 1.71 in both cycles; for $\frac{1}{2}D\frac{1}{2}R$ it was 1.62 and 1.56, respectively, in cycles one and two; and it was 1.51 and 1.54, respectively, in cycles one and two for $\frac{1}{4}D\frac{3}{4}R$ ewes.

An average fertility of 76 percent was recorded in both cycles under accelerated lambing. The $\frac{1}{2}D\frac{1}{2}R$ ewes were superior in fertility in the two cycles with 81 and 80 percent, respectively; $\frac{1}{4}F$ were next with 74 and 77 percent, respectively; and $\frac{1}{4}D\frac{3}{4}R$ had 76 and 72 percent, respectively.

Introduction

The basic aim of commercial sheep producers is to increase the efficiency of lamb meat production and this can be achieved most readily by increasing reproductive rate. Two desirable ways of increasing reproductive rate are 1) infusion of germ plasms of more prolific breeds into commercial ewe flocks and 2) adoption of some type of accelerated lambing program to shorten the interval between lambings.

The commercial sheep industry of Oklahoma and the Southwest has been built around Rambouillet ewes which are relatively long-lived and shear heavy fleeces but are slow maturing and not very prolific. Past research at the Oklahoma Agricultural Experiment Station has shown that crossbred ewes of Dorset x Rambouillet breeding are more productive under Oklahoma conditions. Broadening the genetic base of ewe flocks by the introduction from Finland of the Finnish Landrace (Finnsheep) noted for its superior lambing rate, is a possible method of improving the productivity of the commercial sheep even more.

A program of lambing every 8 months (accelerated lambing) may be feasible because ewes have a 5-month gestation period. Research at this station has shown that ewes of Dorset-Rambouillet breeding produce a desirable lamb crop when lambing in the fall, winter or spring and early in the summer.

The purpose of this paper is to report the reproductive performance of 7- and 8-year-old crossbred ewes of Dorset and Rambouillet breeding with similar ewes containing $\frac{1}{4}$ Finnsheep breeding in six lambings on an accelerated lambing program.

Materials and Methods

In March and April of 1971 and 1972 approximately 250 crossbred ewes of five combinations of Finnsheep (F), Dorset (D) and Rambouillet (R) breeding were produced at the Southwestern Livestock and Forage Research Station (Ft. Reno) El Reno, Oklahoma. The five breed combinations represented were $\frac{1}{2}$ D $\frac{1}{2}$ R; $\frac{1}{4}$ D $\frac{3}{4}$ R; $\frac{1}{4}$ F $\frac{1}{2}$ D $\frac{1}{4}$ R; $\frac{1}{4}$ F $\frac{1}{4}$ D $\frac{1}{2}$ R; and $\frac{1}{4}$ F $\frac{3}{4}$ R. The $\frac{1}{4}$ F $\frac{3}{4}$ R ewes were produced in 1972 only. Reproductive performance of some of these ewes when lambing in the winter of 1972, 1973, 1974 and 1977; the fall of 1974, 1975 and 1977; and the summer of 1976 and 1978 has been reported previously in the Animal Science and Industry Research Reports of 1974-1979.

Ewes nursed their lambs for approximately 70 days after each lambing, except that ewes that lambed late sometimes had their lambs weaned at younger ages because of the next breeding season. Condition scores and weights were taken on the ewes each time before breeding and lambing. Scores ranged from one to nine with a score of one indicating a very thin ewe and a score of nine indicating a very fat ewe.

In both cycles under accelerated lambing, breeding seasons were as follows: January-February breeding for summer lambing; May-June breeding for fall lambing; and September-October breeding for winter lambing. Each breeding season lasted approximately 45 days. Prior to each breeding season, ewes were divided into single sire breeding groups of 28 to 36. Breeding groups were equalized as closely as possible for number of ewes of each crossbred group and for number of ewes rearing zero, one or multiple lambs the previous lambing. A Hampshire, Suffolk, Hampshire x Suffolk or Suffolk x Hampshire sire was placed with each breeding group. A total of eight rams (four purebreds and four crossbreds) are therefore used each breeding season.

Each lambing season, ewes lambed under close supervision in a barn or adjacent pasture. In the summer lambings, after lambs were about a week old, both ewes and lambs had access to sweet sudan and pearl millet pasture and alfalfa pasture. Dry weather usually forced the feeding of supplemental ground alfalfa and grain toward the end of the summer seasons. For winter and fall seasons ewes and lambs grazed small grain pasture after lambs were about a week old. Ewes had access to some dry hay and about $\frac{1}{2}$ lb of grain per day for a month or two. In all seasons, lambs had access to creep feed during the preweaning period. At approximately 70 days of age, lambs were weaned from their dams except that late-born lambs were weaned 4 to 5 days before ewes were to be bred.

Results and Discussion

Ewe reproductive performance

Lambing performance of the five crossbred groups for the six seasons under accelerated lambing are presented in Table 1. This table gives the number of ewes exposed, number of ewes lambing and the number of lambs born for each season. The first three seasons, i.e., summer 1976, winter 1977 and fall 1977, were added together to give the overall performance in the first accelerated lambing cycle presented in Table

2a. Summer 1978, winter 1979 and fall 1979 results were also added together to give the overall performance in the second accelerated lambing cycle presented in Table 2b.

The average percent of ewes lambing for all breeds of ewes in the first cycle (688 lambing opportunities) was 76.0. This was virtually the same as the 76.3 percent recorded in the second cycle for 498 lambing opportunities. Lambs born per ewe exposed for all ewes per year was 1.88 in the first cycle and exactly the same figure was obtained in the second cycle. Total number of ewes exposed was 668 in the first cycle compared to 498 in the second cycle. This was because the results for three rams in winter 1979 and the results for two rams in fall 1979 had to be discarded as a result of epididymitis.

Fertility, as measured by percent of ewes lambing in the first cycle, ranged from a high of 80.5 percent for $\frac{1}{2}D\frac{1}{2}R$ ewes to a low of 70.9 percent for $\frac{1}{4}F\frac{1}{4}D\frac{1}{2}R$ ewes. The other breed groups ranged from 77.0 percent for $\frac{1}{4}F\frac{3}{4}R$ to 75.4 percent for $\frac{1}{4}F\frac{1}{2}D\frac{1}{4}R$. In the second cycle (Table 2b) fertility was distributed slightly differently with a high of 80.2 percent for $\frac{1}{2}D\frac{1}{2}R$ ewes and a low of 72.2 percent for $\frac{1}{4}D\frac{3}{4}R$ ewes. The other breed groups ranged from 78.8 percent for $\frac{1}{4}F\frac{3}{4}R$ to 74.7 percent for $\frac{1}{4}F\frac{1}{2}D\frac{1}{4}R$.

Past results from May-June breeding suggest that the ewes are less sexually active when bred during this season. Results from May-June 1974, 1975, 1977 and 1979 breeding show that crossbred rams have an advantage over purebred rams in getting more ewes settled during this difficult period. Again lower fertilities have been obtained in the May-June period than in either the January-February or September-October period. Fertilities that have been obtained in September-October and January-February breeding seasons have been high and similar.

Lambing rates (lambs born per ewe lambing) in the first cycle for the individual breed groups ranked as follows: 1.77, 1.73, 1.62 and 1.51, respectively, for $\frac{1}{4}F\frac{1}{4}D\frac{1}{2}R$; $\frac{1}{4}F\frac{3}{4}R$; $\frac{1}{2}D\frac{1}{2}R$; $\frac{1}{4}F\frac{1}{2}D\frac{1}{4}R$; and $\frac{1}{4}D\frac{3}{4}R$. Lambing rates for the second cycle were as follows: 1.74, 1.71, 1.66, 1.56 and 1.54, respectively, for $\frac{1}{4}F\frac{1}{2}D\frac{1}{4}R$; $\frac{1}{4}F\frac{1}{4}D\frac{1}{2}R$; $\frac{1}{4}F\frac{3}{4}R$; $\frac{1}{2}D\frac{1}{2}R$; and $\frac{1}{4}D\frac{3}{4}R$.

Lambs born per ewe exposed is an overall measure of reproductive performance and a combination of both fertility and lambing rate. In the first cycle, lambs born per ewe exposed ranged from a high of 1.33 for $\frac{1}{4}F\frac{3}{4}R$ to a low of 1.15 for $\frac{1}{4}D\frac{3}{4}R$. Other groups were between 1.30 for $\frac{1}{2}D\frac{1}{2}R$ and 1.22 for $\frac{1}{4}F\frac{1}{2}D\frac{1}{4}R$. In the second cycle, lambs born per ewe exposed ranged from 1.31 for $\frac{1}{4}F\frac{1}{4}D\frac{1}{2}R$ and $\frac{1}{4}F\frac{3}{4}R$ to 1.11 for $\frac{1}{4}D\frac{3}{4}R$. Two other groups recorded 1.30 for $\frac{1}{4}F\frac{1}{2}D\frac{1}{4}R$ and 1.25 for $\frac{1}{2}D\frac{1}{2}R$.

Comparing only ewes of $\frac{1}{2}D\frac{1}{2}R$ and $\frac{1}{4}D\frac{3}{4}R$ breeding, ewes of $\frac{1}{2}D\frac{1}{2}R$ breeding outperformed ewes of $\frac{1}{4}D\frac{3}{4}R$ breeding in terms of lambing percent (80.5 *vs* 76.3) and lambs born per ewe exposed per year (1.95 *vs* 1.73) in the first cycle. The same pattern of results was obtained in the second cycle also. Ewes of $\frac{1}{2}D\frac{1}{2}R$ breeding outperformed ewes of $\frac{1}{4}D\frac{3}{4}R$ breeding (80.2 *vs* 72.2) in terms of lambing percent and also in terms of lambs born per ewe exposed per year (1.88 *vs* 1.67). This is as expected, based on how ewes of similar breeding have performed in the past.

Comparing ewes of only $\frac{1}{2}D$ breeding to all those of $\frac{1}{4}F$ breeding in the first cycle, ewes of $\frac{1}{2}D$ breeding outperformed ewes of $\frac{1}{4}F$ breeding in lambing percent (80.5 *vs* 74.1) and lambs born per ewe exposed per year (1.95 *vs* 1.89). In the second cycle, however, ewes of $\frac{1}{2}D$ breeding still outperformed ewes of $\frac{1}{4}F$ breeding in lambing percent (80.2 *vs* 76.7), but $\frac{1}{2}D$ performed poorer than $\frac{1}{4}F$ ewes in lambs born per ewe exposed per year (1.88 *vs* 1.97).

Table 1. Lambing performance of five crossbred ewe groups in summer 1976, winter 1977, fall 1977, summer 1978, winter 1979 and fall 1979.

Breed group	Summer 1976			Winter 1977			Fall 1977		
	No. exposed	No. lambing	No. born	No. exposed	No. lambing	No. born	No. exposed	No. lambing	No. born
1/2D1/2R	49	46	70	50	48	89	50	26	35
1/4D3/4R	56	52	74	52	50	81	52	20	29
1/4F1/2D1/4R	40	40	65	39	36	62	39	13	17
1/4F1/4D1/2R	47	44	77	47	42	79	47	14	21
1/4F3/4R	33	33	51	34	32	66	33	12	16
Breed group	Summer 1978			Winter 1979 ¹			Fall 1979 ¹		
	No. exposed	No. lambing	No. born	No. exposed	No. lambing	No. born	No. exposed	No. lambing	No. born
1/2D1/2R	46	39	69	25	17	26	35	29	38
1/4D3/4R	49	44	68	32	25	40	45	22	32
1/4F1/2D1/4R	35	30	59	21	15	27	27	17	22
1/4F1/4D1/2R	45	40	75	27	22	40	36	21	27
1/4F3/4R	31	30	53	19	15	25	25	14	20

¹Summaries here are from 5 pure- and crossbred rams for winter 1979; from 6 pure- and crossbred rams for fall 1979, instead of 8 pure- and crossbred rams for the other seasons.

Table 2a: Lambing performance of five crossbred ewe groups in the 1st accelerated lambing—summer 1976, winter 1977 and fall 1977.

Breed group	No. exposed	No. lambing	% lambing	Number of lambs born	Lambs born per ewe lambing	Lambs born per ewe exposed	Lambs born/year/ewe exposed
½D½R	149	120	80.5	194	1.62	1.30	1.95
¼D¾R	160	122	76.3	184	1.51	1.15	1.73
¼F½D¼R	118	89	75.4	144	1.62	1.22	1.83
¼F¼D½R	141	100	70.9	177	1.77	1.26	1.89
¼F¾R	100	77	77.0	133	1.73	1.33	2.00
All ewes	668	508	76.0	832	1.64	1.25	1.88

Table 2b: Lambing performance of the five crossbred ewe groups in the 2nd accelerated lambing cycle—summer 1978, winter 1979 and fall 1979.

Breed group	No. exposed	No. lambing	% lambing	Number of lambs born	Lambs born per ewe lambing	Lambs born per ewe exposed	Lambs born/year/ewe exposed
½D½R	106	85	80.2	133	1.56	1.25	1.88
¼D¾R	126	91	72.2	140	1.54	1.11	1.67
¼F½D¼R	83	62	74.7	108	1.74	1.30	1.95
¼F¼D½R	108	83	76.9	142	1.71	1.31	1.97
¼F¾R	75	59	78.7	98	1.66	1.31	1.97
All ewes	498	380	76.3	621	1.63	1.25	1.88