

# crossbreeding

for increasing  
multiple births  
in sheep

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Since the net profit in any sheep enterprise is largely dependent on the number of lambs produced and marketed, multiple birth has always been an important factor in sheep production. The importance of multiple births has increased recently with the intensification of sheep production, by early weaning and artificial rearing of lambs.

Factors affecting multiple birth in sheep can be divided into two broad categories — environmental and genetic. The environmental factors known to affect multiple births include age and weight of ewe, age of ram, type of birth of both ewe and ram, as well as the general nutritional status of the flock before the breeding season and during gestation. Differences among breeds in their tendency for multiple birth is the main genetic factor. Breeds of sheep are known to

differ widely in the frequency of multiple births.

Scientists have shown that selection for improving the percentage of multiple births is only moderately effective because the inherited part of this trait is small and is often offset by the many uncontrollable environmental factors. Crossing different breeds might be expected to improve the tendency for multiple births through the exhibited phenomenon of heterosis.\*

The following results on multiple births in sheep were obtained from a crossbreeding experiment conducted at the Lennoxville Research Station during the period from 1956 to 1966.

1) The frequency of multiple births. A total of 941 lamb births were used in the present study, of which 456 (48.5%) were twins and 26 (2.8%) were triplets. Multiple births referred to in this study are those in which the ewe gave birth to more than one lamb (twins or triplets).

\*Hybrid vigour.

**TABLE 1. MULTIPLE BIRTH PERCENTAGE IN DIFFERENT BREEDS AND CROSSES**

Breed of Ram	Breed of Dam												Totals	
	Oxford, O		Suffolk, S		Chev X O		S X O		Chev X S		O X S			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Oxford, O	75	28	45	73	98	48	47	66	33	58			298	51
Suffolk, S	60	33	79	56	96	60			24	46	31	48	290	51
Cheviot, C	55	38	42	69			55	64			34	53	186	55
C X O	52	33	28	71									80	46
S X O	28	50											28	50
C X S	30	43	14	43									44	43
O X S			15	67									15	67
Totals	300	35	223	64	194	54	102	64	57	53	65	51	941	51

**SUMMARY**

Breed of ewe:		No.	%	Breed of Ram:		No.	%	Crossbreeds - Purebreds = 10.5%		
Purebred Oxford		300	35.3	Purebred Suffolk		223	63.7			
Crossbred Oxford		296	57.8	Crossbred Suffolk		122	51.6			
Breed of Ram:		No.	%	No.	%	No.	%	Crossbreeds - Purebreds = -4.4%		
Purebred Oxford		298	50.7	Purebred Suffolk		290	51.0	Purebred Cheviot	186	55.4
Crossbred Oxford		123	49.6	Crossbred Suffolk		87	49.4	Crossbred Cheviot	124	45.2
Matings:		No.	%	%		%		%		
Purebreds	O	75	28.0	42.2						
	S	79	55.7							
2-breed cross	C X O	55	38.2	35.6		%				
	S X O	60	33.3	51.0						
	C X S	42	69.0	71.3						
	O X S	45	73.3							
Backcross	¼ O ¼ C	150	42.7	48.4				crossbred sires 43.1		
	¼ O ¼ S	75	60.0	48.9				crossbred dams 52.0		
	¼ S ¼ C	38	44.7	48.8						
	¼ S ¼ O	46	52.2							
3-breed cross	¼ C ¼ S ¼ O	63		50.8				crossbred sires 56.9		
	¼ C ¼ O ¼ S	124		62.9		59.1		crossbred dams 59.6		
	¼ O ¼ S ¼ C	89		56.9						

2) Effect of crossing. The number and percentage of multiple births by Oxford, Suffolk and Cheviot breeds and their different crosses are presented in Table 1. Oxford crossbred ewes (Cheviot X Oxford, and Suffolk X Oxford) had 22.4% more multiple births than purebred Oxfords, and purebred Suffolk had 12% more multiple births than crossbreds (Cheviot X Suffolk, and Oxford X Suffolk).

The comparison of the percentage of multiple births by purebred and crossbred rams showed that purebred Oxford and Suffolk were only slightly superior to crossbred rams, while there was a marked difference between purebred and cross-

bred Cheviot rams. The results also showed that within breed of ewe (Oxford or Suffolk), the use of rams not belonging to the same breed (or crossbred rams) increased the incidence of multiple births.

Matings producing three-breed crosses showed higher percentages of multiple births than those producing two-breed crosses - those in turn were slightly superior to backcrossing.

3) Effect of age. The influence of age of ewe and age of ram on multiple birth percentage is shown in Table 2. The results indicated that the tendency for multiple births increases gradually with age of ewe, with the maximum occurring from the

**TABLE 2. THE PERCENTAGE OF MULTIPLE BIRTHS AT DIFFERENT AGES**

Age in years	EWES		RAMS	
	No.	%	No.	%
1			259	47.1
2	209	40.7	507	52.5
3	214	51.9	140	52.9
4	206	53.9		
5	141	58.2		
6	98	53.1		
7	56	53.6		
8 and over	32	50.0		

fourth to the sixth year of age. The effect of age of ram is less evident, but showed the same trend.

4) Effect of type of birth. The percentage of multiple births for ewes and rams which were themselves born twins is higher (about 4.5%) than for those born single, as shown in Table 3. Type of birth of ram seemed about as important as type of birth of ewe.

**TABLE 3. THE PERCENTAGE OF MULTIPLE BIRTHS ACCORDING TO TYPE OF BIRTH OF PARENTS**

Type of birth	EWES		RAMS	
	No.	%	No.	%
Singles	104	43.3	246	50.0
Twins	125	48.0	330	54.2

5) Effect of weight of dam. Within different groups of dams (Oxford, Suffolk, and crosses) the tendency for multiple births increased with the increase in weight of the ewe. This trend is shown in Table 4 for the three groups pooled together.

**TABLE 4. THE PERCENTAGE OF MULTIPLE BIRTHS ACCORDING TO BODY WEIGHT OF DAM**

Body weight of dam, lb.	No.	%
Less than 100	42	16.7
100 - 109	48	35.4
110 - 119	74	32.4
120 - 129	82	39.0
130 - 139	136	49.3
140 - 149	165	52.7
150 - 159	142	52.7
160 - 169	127	63.8
170 - 179	55	70.9
180 - over	79	62.0

It is concluded from this study that a high percentage of multiple births could be obtained by the use of mature purebred rams (born twins) on crossbred ewes (preferably born twins) of different breedings to produce three-breed crosses. If only purebred ewes are raised, however, the rams used should be preferably a different breed than that of the ewes. In all cases, the flock should be maintained in good nutritional condition.



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