FERTILITY IN SHROPSHIRE SHEEP[1]

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Heape (*4*)[2] mentions that in some breeds young ewes bear fewer twins than older ewes. Carlyle and McConnell (*2*) reported some observations which they had made on the effect of age on fertility in sheep from which they concluded that ewes from 3 to 6 years old averaged a larger percentage of lambs than younger or older ewes, and also that 1-year-old rams were not so prolific as those 2 or 3 years old. The same conclusions were reached by Humphrey and Kleinheinz (*6*) from a study of later records of the Wisconsin flock. Recently Jones and Rouse (*7*) showed that in sheep the percentage of twins increased with age until 5 years, when there was a decided drop.

The present paper gives the results of a study of the influence of age and season upon fertility in American Shropshire sheep.

The source of data is the American Shropshire Sheep Record (*1*). Individuals with registry numbers between 325502 and 344869 have been used, date of birth noted, whether born as single, twin, or triplet, and age of dams and sires looked up.

AGE OF EWE AND FERTILITY

Table I shows the percentage of lambs born as singles, twins, and triplets from dams of various ages. Ewes under 1 year and 6 months are grouped in the 1-year class, those 1 year and 7 months to 2 years and 6 months in the 2-year class, and so on. The percentage in multiple births increases to 4 years and remains fairly constant through 8 years. For the older groups the numbers are too small to draw conclusions.

[1] Paper No. 16 from the Laboratory of Genetics, Agricultural Experiment Station, Urbana, Ill.

[2] Reference is made by number (italic) to "Literature cited," p. 234.

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TABLE I.—*Age of ewe and fertility*

Age of dam in years.	Total number of offspring.	Percentage of singles.	Percentage of twins.	Percentage of triplets.	Percentage in multiple births.
1	379	77.0	23.0	.....	23.0
2	2,299	66.4	33.2	0.4	33.6
3	2,025	63.6	36.1	.3	36.4
4	1,762	57.6	41.4	1.0	42.4
5	1,256	58.0	43.0	1.0	44.0
6	942	53.7	46.0	.3	46.3
7	506	56.3	43.1	.6	43.7
8	405	54.8	44.5	.7	45.2
9	157	62.4	37.0	.6	37.6
10	96	38.5	61.5	.....	61.5
11	23	60.9	39.1	.....	39.1
12	3	100.0	.....	.....	.....
13	4	50.0	50.0	.....	50.0
14	1	100.0	.....	.....	.....
15	4	75.0	25.0	.....	25.0
16	5	20.0	80.0	.....	80.0
20 [a]	1	100.0	.....	.....	.....
	9,868	60.8	38.7	.6	39.2

[a] This may be a mistake in the record.

AGE OF RAM AND FERTILITY

Table II gives the percentages of lambs born as singles, twins, and triplets born from sires of various ages. From these percentages one can not ascribe to the ram any influence on fertility. Carlyle and McConnell (*2*) thought that 1-year-old rams were not so prolific as older rams, but this is not borne out by the figures in Table II.

TABLE II.—*Age of ram and fertility*

Age of ram in years.	Total number of offspring.	Percentage of singles.	Percentage of twins.	Percentage of triplets.	Percentage in multiple births.
1	1,101	58.7	40.4	0.9	41.3
2	3,265	60.6	39.0	.5	39.4
3	2,552	59.1	39.9	1.0	40.9
4	1,460	65.8	33.8	.2	34.0
5	650	55.5	43.8	.6	44.5
6	434	66.1	33.6	.2	33.9
7	244	70.5	29.5	.....	29.5
8	118	74.6	25.4	.....	25.4
9	71	63.4	36.6	.....	36.6
10	47	68.1	25.5	6.4	31.9
11	2	100.0	.....	.....	.....
12	3	100.0	.....	.....	.....
	9,947	61.2	38.2	.6	38.8

TIME OF BIRTH AND TWINNING

Heape (*5*), who gathered information from flock masters, states that 55 per cent of them reported that twins were usually born early in the

lambing season. To test this point Table III was made, showing the month of birth and the percentages of singles, twins, and triplets. It is readily seen that a larger percentage of twins is born early in the season than is born later. Of the 3,790 lambs born in January, February, and March 42.3 per cent are twins, while of the 4,617 born in April, May, and June only 36.1 per cent are twins. If the triplets are added in with the twins the percentages are 43.1 in multiple births for January, February, and March, and 36.7 for April, May, and June. As Heape (5) points out, this may be due to the ewes with the most vigorous and active generative systems coming into heat earlier in the season. This may be also affected by the fact that early in the breeding season more green feed is available, a factor influencing the number of twins produced.

TABLE III.—*Months of birth* (*Shropshires*)

Month.	Total number.	Percentage of singles.	Percentage of twins.	Percentage of triplets.
January	33	75.8	24.2	.....
February	471	56.7	43.1	0.2
March	3,286	56.7	42.4	.9
April	3,615	62.4	37.0	.6
May	966	66.3	32.9	.8
June	36	75.0	25.0	.....
August	2	100.0	.....	.....
September	1	100.0	.....	.....
December	7	100.0	.....	.....

In the hope that additional information might be obtained, a study was made of the Dorset breed (3), which produces a large number of young in the fall. Table IV gives the month of lambing and the percentages of singles, twins, triplets, quadruplets, and of all multiple births.

TABLE IV.—*Months of birth* (*Dorsets*)

Month of birth.	Total number.	Percentage of singles.	Percentage of twins.	Percentage of triplets.	Percentage of quadruplets.	Percentage in multiple births.
January	1,818	61.5	37.1	1.3	0.1	38.5
February	2,386	54.3	41.9	3.8	.....	45.7
March	3,919	52.7	43.9	3.2	.2	47.3
April	2,366	51.7	45.4	2.6	.3	48.3
May	857	54.8	43.1	2.1	.....	45.2
June	296	59.8	38.5	1.7	.....	40.2
July	90	65.6	27.8	6.6	.....	34.4
August	102	68.6	30.4	1.0	.....	31.4
September	925	73.7	25.3	.9	.1	26.3
October	1,546	66.2	32.9	.9	.....	33.8
November	1,088	67.7	30.5	1.8	.....	32.3
December	1,418	61.0	36.8	2.2	.....	39.0
	16,634	57.8	39.7	2.4	.1	42.2

From Table IV it can be clearly seen that the percentage of multiple births is greater in the spring. If the births occurring from February to June, inclusive, are combined it is found that 48.2 per cent are in multiple births, while for the other months the percentage is 34.9. In Shropshires a larger percentage of twins or multiple births occurs in January, February, and March than later. This condition does not seem to hold for the Dorsets. Therefore, this condition in the Shropshires is not likely due to more green feed early in the mating season. The causes of these significant differences in multiple births at different seasons among sheep are yet to be discovered.

SUMMARY

(1) Multiple births increase with age up to 4 years. From this point they remain fairly constant until 8 years. Beyond this age the numbers are too small to draw conclusions.

(2) The age of the ram has no influence on the percentage of multiple births.

(3) Among Shropshire sheep more multiple births occur early in the lambing season than later.

(4) Among Dorsets more multiple births occur in spring than in fall.

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