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Lambing of Romney and Booroola cross hoggets with and without the F gene under different pasture allowances

R.W. MOORE, W.H. MCMILLAN, G. DOCKRILL

MAFTech, Whatawhata Research Centre, Hamilton

B.W. DOW

MAFTech, Ruakura Agricultural Centre, Hamilton

ABSTRACT

The hogget reproduction of 67 FF/F+ and 27 + + (Booroola x Romney) x (Booroola x Perendale), 30 Waihora (WR) and 39 Marshall Romney (MR) hoggets was compared under 4 nutritional treatments. The September born ewe lambs were grazed from 6 January to 5 June at 4 different pasture allowances:- 2, 4, 6, and 10 kg DM/ewe/d. Three allowances (2, 4, 10) were continued until 11 September, following this date all ewes grazed together. There were significant effects of allowance on the percentage of ewes tupped and pregnant. There was no effect of genotype on these fertility traits. The percentages of ewes lambing multiples/ewes lambing were FF/F+ 58, + + 0, MR 11, and WR 27. The percentages of lambs weaned/lambs born were similar: 72, 59, 77 and 79 respectively. The percentages of lambs weaned/ewes joined were 58, 26, 26, and 49 respectively.

Keywords Hoggets; Romney; Booroola cross; F gene; grazing allowance; fertility; prolificacy

INTRODUCTION

There do not appear to be any previous published reports on the effect of the F gene on hogget lambing, however G.H. Davis (pers.comm.) has carried out hogget lambing of various longwool breeds of ewes with and without the F gene. He found that hoggets with the F gene had higher lambing percentages than comparable hoggets without the F gene, but some of the flocks with the F gene had unacceptable levels of lamb mortality (56% survival).

There have been conflicting reports on the effect of the F gene on hogget oestrus and ovulation. Baker (1985) found at Rotomahana that F+ Booroola x Romney or Booroola x Perendale ewe lambs had more hogget tup marks than similar ewe lambs with a ++ genotype, associated with an earlier onset of oestrus in both breeds, despite the fact that the F+ hoggets were lighter at weaning and at their October weight. In contrast to this Kelly *et al*. (1984) found no difference between F+ and ++ hoggets with the exception of a difference of 0.5 in ovulation rate.

MATERIALS AND METHODS

The design was a 4x4 factorial with 4 genotypes:-
1. F- FF/F+ (Booroola x Romney) x (Booroola x Perendale)
2. ++ (Booroola x Romney) x (Booroola x Perendale)
3. MR Marshall Romney
4. WR Waihora Romney

and 4 pasture allowances; 2,4,6 and 10 kg DM/ewe/day. The 4 groups constituting the 4 pasture allowances were moved once a week. The area of pasture allocated to each group was calculated from the pre-grazing yield of grass, estimated as described by Haydock and Shaw (1975) and from the number of sheep in the group.

The ewe lambs were divided into 4 matched groups and put onto the 4 pasture allowances on 6 January, these continued until 5 June when the 2 highest allowances were combined on 10 kg DM/ewe/day. The 3 allowances were continued until 11 September, when all ewes were grouped together.

The ewe lambs were joined to fertile Waihora rams from 21 April to 26 May with tup marks being recorded fortnightly. The date of giving birth and the number of lambs born was recorded for all ewes, as was the number of lambs surviving to weaning. All ewes were pregnancy ultra-scanned on 15 July. These data was not corrected for obvious conflicts with the lambing data.

TABLE 1 Effect of genotype on hogget fertility.

Genotype	n	% Tupped	% Pregnant	% Lambing
F-	67	73	67	48
++	27	77	55	44
MR	39	84	79	37
WR	30	84	60	55
Max. SED		9.6	12.1	12.2

TABLE 2 Effect of nutrition on hogget fertility.

Allowance (kg DM/ewe/d)	n	% Tupped	Mean day 1st tup	% Pregnant	% Lambing
2	55	64	14/5	55	35
4	58	78	14/5	65	44
6	56	84	10/5	77	56
10	58	93	8/5	75	46
Max. SED		8.8	2.5	9.5	9.9

RESULTS

There were significant effects of genotype and nutrition on live weight (Figure 1 and 2). On April 1 the weights of the 4 genotypes were; F-, 25; + +, 30; MR, 35; WR, 32 kg; whereas the weights of the 4 allowances were; 2, 28; 4, 30; 6, 31; 10, 32 kg.

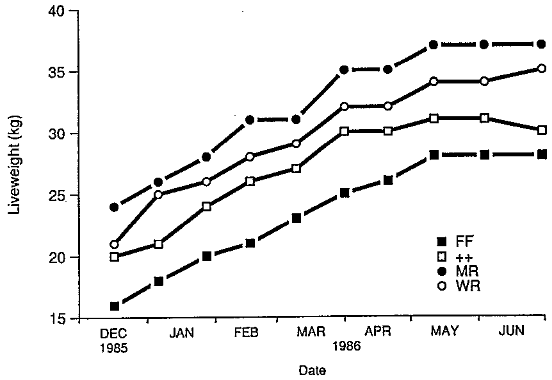

FIG. 1 The effect of genotype on hogget growth curves, maximum SED was 1.0 kg.

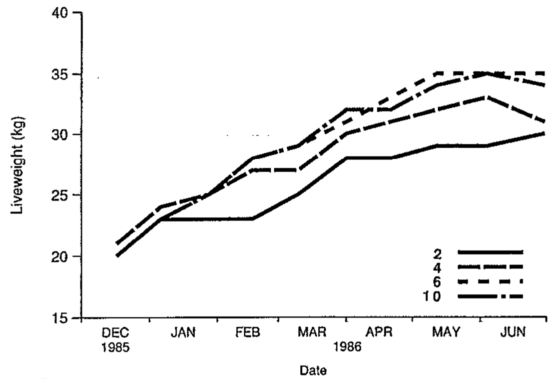

FIG. 2 The effect of grazing allowance on hogget growth curves, maximum SED was 0.5 kg.

There was little effect of genotype on fertility traits (Table 1). There were significant effects of nutrition on the percentage of ewes tupped, the average day of first tup and the percentage pregnant but not on the percentage lambing (Table 2).

TABLE 3 Effect of genotype on hogget prolificacy, lamb survival and weaning percentage.

Genotype	% Multiple pregnant/ewes pregnant	% Multiple lambing/ewes lambing	% Lambs weaned/lambs born	% Lambs weaned/ewes joined
F-	67	58	72	58
++	0	0	59	26
MR	10	11	77	26
WR	13	27	79	49
Max. SED	10.0	12.5	17.7	-

TABLE 4 Effect of nutrition on hogget prolificacy, lamb survival and weaning percentage.

Allowance (kg DM/ewe/d)	% Multiple pregnant/ewes pregnant	% Multiple lambing/ewes lambing	% Lambs weaned/lambs born	% Lambs weaned/ewes joined
2	23	19	72	27
4	22	23	76	38
6	25	25	75	52
10	35	49	71	47
Max. SED	9.9	13.9	13.1	-

There were marked effects of genotype on prolificacy traits (Table 3), but no effect on lamb survival. The F- and WR hoggets were clearly more profific than the other 2 genotypes. There were suggestions of effects of nutrition on prolificacy and weaning percentage, but no effects on lamb survival (Table 4).

DISCUSSION

Despite their lower live weights, the hoggets with the F gene are more fecund than those without the F gene. The survival rates of lambs born to the F gene hoggets were similar to the survival rates of lambs born to the other genotypes, despite the fact that a higher percentage were born as twins.

At present the accepted criterion for classifying a ewe as possessing the F gene is a triplet ovulation, pregnancy or lambing. We wish to suggest an alternative criterion using hogget prolificacy, that is the presence of a twin ovulation, pregnancy or birth. In this study using the criterion of a twin pregnancy the percentages of ewes classified as F carriers were (fertility x prolificacy) F- 46%, + + 0%, MR 5%, and WR 5%; using the criterion of a twin birth the corresponding figures were 28%,0%,3%, and 13%. For a ewe to be recognised as a F carrier as a hogget it must be grown well enough to reach puberty and ovulate. This is clearly nutrition dependent, the percentage of carriers pregnant at the 4 allowances being 47, 50, 88 and 82 respectively. In contrast, the effect of nutrition on hogget prolificacy was not marked.

While the criterion of hogget prolificacy is not precise enough to be used as a means of determining genotypes of individual ewes, it could be used by farmers who are interested in early culling and wish to retain the F gene in a high percentage of ewes. The errors involved in this hogget twinning criterion need to be compared with the conventional two-tooth triplet criterion in flocks of known genotype.

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