

INTROGRESSION OF THE Fec^B ALLELE OF THE BOORoola MERINO INTO A RAMBOUILLET FLOCK - A PROGRESS REPORT

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Objectives

1) Determine the effect of the Fec^B allele of the Booroola Merino in a U.S. sheep flock unconfounded by background genotype, and 2) develop a flock of high percentage Rambouillet sheep with the Fec^B allele.

Procedure

A project to introgress the Fec^B into a Rambouillet flock was initiated at the Dixon Springs Agricultural Center of the University of Illinois in 1985, and the project was moved to the Arlington Agricultural Research Stations of the University of Wisconsin-Madison in 1991. This report presents results obtained during the 1997 breeding and 1998 lambing season.

Rambouillet (Fec^{++}) and Booroola Merino (Fec^{BB}) rams were initially mated to a flock of Rambouillet ewes during the autumns of 1985 through 1988. Booroola Merino-Rambouillet cross female progeny from this mating and subsequent matings were backcrossed to Rambouillet rams, and Rambouillet ewes continued to be mated to Rambouillet rams. The same Rambouillet rams were mated with the Rambouillet and Booroola Merino-cross ewes. Lambs were weaned at approximately 60 days of age. Rambouillet replacement ewes and rams were selected on estimated genetic merit for litter size using the "Number of Lambs Born" FEPD from NSIP. Rambouillet/Booroola Merino-cross (RB) replacement ewes had to be an F1 or have a dam that had been classified as a carrier (Fec^{B+}). Selection preference was given to ewe lambs with higher percentages of Rambouillet breeding. Ewes were mated in order to lamb first at approximately 2 years of age and annually thereafter. Prior to breeding each year, ovulation rate of ewes was determined by counting number of corpora lutea viewed with a laparoscope. RB ewes were classified as carriers (Fec^{B+}) if they had 3 or more ovulations at their first examination at approximately 19 months of age and non-carriers if they had 1 or 2 ovulations. After their first or second lambing, the Fec^{++} RB ewes generally were culled to make room for RB replacements from dams classified as Fec^{B+} . Approximately 60 Rambouillet and 60 RB ewes were mated each year.

In 1998, the majority of the RB ewes were of 7/8 or 15/16 Rambouillet breeding. Given the replacement policy used, the average age of the ewe groups differed and ranked from oldest to youngest, was Rambouillet, RB Fec^{B+} , and RB Fec^{++} .

Results

Performance of the breed groups in the 1997/1998 production year is reported in Table 1. No significant difference was found between the three groups for ewe productivity (kg of lamb weaned per ewe exposed). The RB Fec^{B+} ewe group did have a significantly higher prolificacy and ovulation rate ($P < .05$) than the other two Fec^{++} groups. The significant difference of prolificacy was nullified by non-significant decreases in lamb survival and weaning weight.

Results found are similar to past years where the increase in prolificacy of carriers of the Fec^B allele was negated by reduced lamb survival and weaning weight. The cause of decreased survival and weaning weight could be due to various factors. Management techniques have been improved in handling the increased prolificacy, but the management system may be too demanding for ewes to handle more than 2 lambs efficiently.

Table 1. Least squares means (\pm SE) of lamb growth and reproductive performance of Rambouillet[†] ewes

Trait	Ewe breeding and genotype		
	Rambouillet, Fec^{++}	RB, Fec^{++}	RB, Fec^{B+}
Ewes mated, no.	61	13	47
Ovulation rate, no.	1.89 \pm .13 ^a	1.75 \pm .19 ^a	3.44 \pm .14 ^b
Fertility, %	86.0 \pm 4.4	84.9 \pm 10.7	91.8 \pm 4.9
Prolificacy, no.	1.72 \pm .09 ^a	1.72 \pm .22 ^a	2.18 \pm .10 ^b
Lamb survival, %	94.9 \pm 3.3	91.1 \pm 6.3	87.5 \pm 3.0
Lamb weaning weight, kg	17.48 \pm .56	16.59 \pm 1.09	16.38 \pm .51
Ewe productivity, kg	23.81 \pm 1.49	21.51 \pm 3.63	26.11 \pm 1.62

[†] Rambouillet (Fec^{++}), RB (Fec^{++}), and RB (Fec^{B+}) ewes

^{a,b} Within a column and of an independent factor, means lacking a common superscript letter are different ($P < .05$).