

LITTER SIZE, BIRTH WEIGHT AND WEANING WEIGHT IN DORSET, FINNISH LANDRACE OR BOOROOA MERINO Sired LAMBS

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Story in Brief

Rambouillet ewes (n=242) were exposed to sires of one of three breeds: Dorset, Finnish Landrace or Booroola Merino. These matings resulted in 343 crossbred progeny. Breed of sire had a significant effect on the 70 day weights of the lambs but not on litter size, birth weight or survival to 70 days. Mean performance for litter size, birth weight, survival to weaning and 70 day weight for Dorset, Finn and Booroola sired lambs, respectively, were: 1.68, 1.76, 1.68 lambs; 9.94, 9.44, 9.43 lbs; 74, 79, 71%; 38.17, 41.63, 34.38 lbs. These results indicate that the Booroola Merino, while contributing a gene for prolificacy, will produce lambs that have relatively slow growth rate.

(Key Words: Sheep, Booroola Merino, Finnish Landrace, Litter Size, Growth Performance)

Introduction

Increased litter size is probably the most sought after goal in the sheep industry. In recent years the discovery of the Booroola strain of Merino in Australia has sparked renewed interest in this topic. The increase in litter size of the Booroola Merino over control Merino ewes is remarkable (2.9 vs .7 lambs). This increase is apparently caused by a single gene called the fecundity gene (F gene) much like the classical horned vs polled gene in cattle.

Proper evaluation of this breed requires comparison to a highly fecund breed which derives its fecundity by more typical quantitative gene action. The Finnish Landrace is a readily available highly fecund breed for which there is a large amount of research. Comparison to a breed, such as the Dorset, which is a frequent contributor to crossbred ewe flocks is also useful. With these thoughts in mind, a project was initiated to compare the productivity and reproductive biology of the Booroola Merino, Finn and Dorset Breeds. This report summarizes the initial performance to weaning of the crossbred lambs.

Materials and Methods

Rambouillet ewes (n=242), located at the Forage and Livestock Research Laboratory, El Reno, Oklahoma, were randomly assigned to one of three sire breed groups (i.e. Dorset, Finnish Landrace or Booroola Merino). Beginning September 15, and continuing for 60 days, the ewes were placed with fertility tested rams which were either Finnish Landrace (Finn), Dorset or Booroola Merino. Ram fertility had been evaluated by semen volume, sperm motility and sperm concentration. The Booroola Merino rams were progeny tested homozygous carriers of the

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Fecundity gene (FF). They were obtained from the US Meat Animal Research Center (MARC) in Clay Center, Nebraska. US MARC also furnished the Finn rams which were used in the study. Dorset rams were obtained from a purebred breeder in the El Reno area. All ewes were condition scored 6 weeks prior to breeding (using a 1 to 5 scoring system: 1=emaciated, 5=obese).

Ewes were handled as one large flock during the gestation period in order to reduce any variation due to their location during the winter. At lambing, ewes were placed in smaller lambing pastures. Ewes lambed primarily unassisted and the lamb numbers reflected by this study are based on the number of fully-formed fetuses for each ewe.

Results and Discussion

The breed of sire was not significant either for total number of lambs or number of lambs born alive. Breed did not have a significant effect on birth weight, however, the lambs sired by Dorset rams tended to be heavier than either the Finn- or Booroola Merino-sired lambs (Table 1). Similarly, breed of sire did not have a significant effect on survival of the lambs to weaning (70 days), but Finn-sired lambs tended to have the best survival rate followed by the Dorset-sired lambs. Weaning weight was affected by breed of sire ($P < .01$). Finn-sired lambs were the heaviest (41.63 lb) followed by Dorset (38.17 lb) and Booroola Merino (34.38 lb) (Table 2).

Individual sire had a significant effect on birth weight ($P < .05$) and weaning weight ($P < .01$). Litter size had a significant effect on birth weight ($P < .01$), survival to weaning ($P < .05$) and weaning weight ($P < .01$) of the lambs. The lambs' ability to survive from birth to weaning was significantly affected by the body condition of the ewe at the time of breeding ($P < .01$). Ewe condition score also tended to have an effect on the birth weight of the offspring ($P < .1$).

This study suggests that, among these three breeds, differences are minimal for birth and early post-natal characteristics (i.e. litter size, birth weight and survival to weaning). However, at weaning the Finn-sired lambs were the heaviest followed by the Dorset-sired lambs.

Table 1. Least squares means for birth characteristics in Dorset-, Finn- and Booroola Merino-sired lambs^a.

Breed of Sire	Total Born	Born alive	Birth weight
Dorset	1.65(35)	1.42(35)	9.94(51)
Finn	1.59(115)	1.40(115)	9.07(169)
Booroola Merino	1.65(92)	1.38(92)	9.05(136)
Standard Error	0.217	0.086	0.447

^aNumber of animals is shown following each mean.

Table 2. Least squares means for weaning characteristics in Dorset-, Finn- and Booroola Merino-sired lambs^a.

Breed of sire	Survival to weaning	Adjusted weaning weight ^b
Dorset	0.740(51)	38.17(47)
Finn	0.788(169)	41.63(156)
Booroola Merino	0.707(136)	34.38(124)
Standard Error	0.073	1.699

^aNumber of animals is shown following each mean.

^bBreed of sire was a significant source of variation for adjusted weaning weight.

The lambs sired by Booroola Merino rams were significantly lower in body weight at 70 days than either the Finn or Dorset sired lambs. Other research indicates that the lighter body weight results from typical Merino performance and was not caused directly by the presence of the F gene. This report is from the first year of a long-term study of these breeds. The ewe lambs from this portion of the study will be incorporated into the breeding program in order to evaluate F₁ reproductive performance and investigate reproductive biology in sheep.¹