

IMPROVE PROLIFICACY OF THE DLS BREED OF SHEEP BY TRANSFERRING THE PROLIFICACY GENE (F) FROM THE BOORoola BREED



FRANÇOIS CASTONGUAY¹, MIKE H. FAHMY¹ ET DENIS LAVALLÉE²

 Agriculture et
Agroalimentaire Canada

¹Agriculture and Agri-Food Canada, Dairy and Swine Research and
Development Centre, Lennoxville.

²Commercial producer.

Résumé de recherche

This project was undertaken to develop a new breed of sheep by introgressing the mutant Booroola allele (B) responsible for high prolificacy from Merino sheep into the DLS breed. The development of that new breed was unique in the sense of crossing and back crossing to achieve the final combination of 3/8 Merino-5/8 DLS, then test the animals for the presence of the Booroola allele and multiply animals with that mutation to obtain a prolific population homozygous for the B gene. The basic population of DLS was mated to a ram homozygous for the B locus. The F1, all heterozygous for the gene were back crossed to DLS rams, thus theoretically half the progeny would be carriers of one copy of the B. These progeny were mated to F1 rams heterozygous for the gene to obtain the final combination, which was then tested for the presence of the B gene. In the first years of the study, the presence of animals with the B mutant allele was determined from repeated laparoscopy and examination of litter size. In latter years, the more accurate procedure of gene markers was used. The results revealed that about 12% of the 3/8B

population homozygous and 36% heterozygous for the B gene. These were close to the theoretical expectations and insures the possibility of creating a homozygous population.

The results of the productivity of the flock indicated that the ewes were capable of maintaining lambing rythm of one parturition each 8 months and their prolificacy increased progressively with the increase in the frequency of the B gene in the flock. The productivity of the flock in terms of lambs weaned and kilograms weaned per ewe per year increased from 1.6 and 35 kg in 1990 to 2.3 and 64 kg in 1996, respectively. This represented an increase of 49 and 82%, respectively and indicates that not only the number of lambs weaned increased but also the average weight of lambs also increased. The increase in ewe productivity was not accompanied by an increase in mortality which remained at the 20% level and was even lower in younger ewes in their first two parities.

The next step after establishing a population of animals confirmed carrying

the mutant B allele, is to increase the gene frequency of the mutant allele by interbreeding and continuously select for animals homozygous for the B locus. This is a continuous process and the resulting stable population will be eligible for

registration as a new breed. An application has been made to consider the developed population as a new breed under development and the name Boolys was chosen for that new breed.