

SELECTION FOR A HIGH FERTILITY MEDIUM PEPPIN MERINO
USING ARTIFICIAL BREEDING TECHNIQUES AND EMBRYO TRANSFER

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The release to the industry of CSIRO'S Booroola Merino sheep has introduced the possibility of significantly raising lambing percentages in Australia's commercial flocks. The aim of the current project is to utilize Booroola rams in the production of a medium wool Peppin Merino.

Breeding Objectives

- (a) A "stud ram" product, the "Peppin Booroola" (PB), incorporating:
- (i) Moderate Booroola fecundity so that ewes sired by PB rams would have a weaned-lamb lambing percentage of 120 to 140%.
 - (ii) Large, plain-bodied sheep with Medium Peppin type wool of about 21 micron fibre diameter.
- (b) On the home property, production of a commercial high fertility prime lamb mother (PLM), viz. Border Leicester (BL) x PB, as a side product derived from cull ewes.

Selection Criteria

Conventional objective criteria will be used for fleece weight, fibre diameter and body weight, with initial selection at hogget age. These criteria are to be combined into an index with hogget ovulation rate in ewes, as estimated from two or more laparoscope observations taken in the breeding season and after first oestrus. Ram indices are to contain an ovulation rate component based on sib information, and on individual scrotal circumference (BEETSON, 1980).

Mating Scheme

Stage 1 - As wide a selection of Booroola rams (pedigree selected for fecundity) as possible will be mated, on at least two occasions, to 200 cfa Medium Peppin stud ewes (drawn from a range of sources), selected on body size and wool type, and mildly superovulated with PMSG.

Stage 2 - The F₁ progeny will be inter se mated. Little selection pressure on fecundity will be possible at this stage.

Stage 3 - The F₂ progeny and later generations will be inter se mated. Here, and in stage 2, twenty ewes of the highest index will be selected every eight months for embryo transfer (ET). All ewes, including the ET donors, will also be artificially inseminated at synchronized oestrus, using progestagen sponges and PMSG, with lambings at eight-monthly intervals.

The Advantages of Embryo Transfer

- (a) Increased selection differential, especially on the dams-to-breed-sons genetic pathway. ET is expected to produce five progeny per ewe every eight months.
- (b) One embryo transferred to each recipient first-cross ewe ensures that all ram lambs (the potential stud sires) express their full genetic potential without litter size complications.
- (c) The ET sires and dams obtain progeny tests, and the young rams produced have sib information available to aid selection.

The PLM Product

This is produced from cull PB ewes in synchronized oestrus naturally mated with Border Leicester rams. The size of the flock will be determined by economic factors.

REFERENCES

- BEETSON, B.R. (1980) Booroola crossing experiments in Western Australia-Booroola Workshop, Armidale, August. 1980.