



Genetics of foot health in merinos.

The health of sheep feet is a significant issue in the Australian sheep industry, especially Merinos in high rainfall zones and in wet years. Susceptibility to footrot has been shown to be heritable and the New Zealand industry has successfully developed a breeding value for footrot that can be used to reliably reduce the susceptibility of sheep to the disease. A recent project funded by Animal Health Australia has demonstrated that similar genetic variation exists in Australia. It is not possible for stud breeders in Australia to have footrot on their property and still trade rams unlike in New Zealand. This means we need designated research sites at locations suitable for a footrot challenge for stud breeders to expose their genetics to footrot and thus enable them to make genetic gains with footrot without having footrot on their property. Other indicator traits such as foot shape and susceptibility to ovine interdigital dermatitis (OID), commonly known as scald, may also be useful in helping stud breeders make genetic gains in disease susceptibility.

Foot abscesses, ovine interdigital dermatitis (OID), shelly hoof, over-grown hooves and poor pastern angle also cause significant lameness and pain to sheep on farms. These lame sheep tend to have poorer condition scores, slower growth rates, lower fertility and lower general productivity. In pregnant ewes, foot problems can be a significant cause of metabolic diseases and lowered lamb survival. There is great potential to improve the productivity and welfare outcomes of sheep farming in Australia's medium to high rainfall zones by reducing the susceptibility of sheep to foot ailments. This project will investigate the genetic variation in these foot conditions and inform the Merino industry on appropriate selection strategies for each of the foot conditions. The project is funded by Australian Wool Innovation, Animal Health Australia and collaborating Merino breeders and conducted by Murdoch University and neXtgen Agri in collaboration with AGBU and SheepMetrix



Opportunities for ram breeders

This project involves three studies: Central Progeny Test, Cull Ram Challenge and Collaborating Breeder Sites.

	Central Progeny Test	Cull ram challenge	Collaborating breeder sites
When	2024-2026	2023-2025	2023-2026
What	Progeny from 60 sires evaluated for foot traits, including scoring of OID and footrot at research sites in Victoria over 3 years	Cull rams from 100 sire groups (8 rams per sire) challenged and scored for OID and footrot at a research site in Victoria over 3 years	2023, 2024 and 2025 drop progeny monitored between 100 and 300 days of age and assessed for OID, foot abscess, and feet and general structure
Cost	\$4000 per sire	\$100 per cull ram	\$5-\$10 per progeny studied depending on the time and travel required

Central Progeny Test

The central progeny test will evaluate 60 sires over 2 years by generating progeny that are fully evaluated for foot traits. In 2024 and 2025, 27 sires per year will be nominated by the industry as the result of a call for entries. An additional 3 sires each year will be selected to provide sufficient linkage to sires that have previously been evaluated for footrot either in Australia or in New Zealand. Artificial insemination programs will be conducted in early 2024 and 2025 at a research site in Victoria. The progeny will be independently scored for feet and general structure at about 300 days of age. They will then be exposed to conditions conducive to OID and scored for this trait. The wether progeny will then be moved to a second research site in Victoria where they will be exposed to and scored for footrot before being sent to the abattoir. The progeny test site will also act as a link between other collaborating flocks. The ewe progeny will have the standard growth, wool and carcass traits measured and will therefore help to link flocks across other traits.

Requirements to participate

Breeders that are entering sires will be expected to provide the semen free of charge, cover the delivery fee of the semen and pay an entrance fee of \$4,000 per sire entered.

Cull ram challenge

Breeders from around Australia will be invited to send in at least 8 cull rams sired by an individual ram. Breeders may provide cull rams from multiple sire groups. The study will test a total of 800 cull rams from up to 100 sire groups across the three years of the experiment. Each year, the rams will be transported to the research site in Victoria so that all rams enter the site over a 7-day period in late winter/spring when conditions are conducive to foot health problems. On arrival, rams will be scored for feet structural traits (if not previously completed as part of the project on their home farm). The rams will be exposed to wet conditions for 2 to 4 weeks and be scored for OID once present at sufficient levels. 'Donor' sheep carrying virulent footrot will then be added to the mob to establish an active footrot challenge. The rams will then be scored for footrot before being treated and sent to the abattoir.

Requirements to participate

Breeders will be required to pay \$100 per cull ram. Breeders will be responsible for transport costs to the research site. All animals will be sold direct to the abattoir and breeders will receive the average price per cull ram.

Collaborating breeder sites

The project will utilise collaborating breeder flocks to generate information on foot health issues including pastern angle, foot structure and shape, OID (Scald) and abscess. A total of 30 collaborating breeder properties will be used across Australia over four years. The project will use progeny born in 2023, 2024 and 2025 at each site, with at least 8 progeny per sire per year required for assessment. The progeny will be monitored for OID and foot abscesses between about 100 and 300 days of age. The incidence of OID and foot abscess are dependent on the environmental conditions and hence these conditions may not be scored at all participating sites. All progeny will have their feet and general structure scored. The research team will be responsible for collecting all data.

Requirements to participate

Collaborating breeders must have full pedigree on the sheep to be included in the study and must be either submitting their data to Sheep Genetics or be willing to submit their data to Sheep Genetics for the purpose of the project. It is preferable that participants also enter sire/s into the Central Progeny Test and enter cull rams into the Cull Ram Challenge. Breeders will be required to pay half of the labour and travel costs of the research team to participate, it is expected that this will be approximately \$5-\$10 per progeny scored, depending on numbers, throughput and number of trips required. Breeders will need to monitor the progeny for lameness weekly from 100 days of age.

To get involved contact:

Amy Lockwood
amy@nextgenagri.com
0429 976 483

Jarryd Krog
jarryd.krog@murdoch.edu.au
0455 506 043

