July 2014

AN EXCITING NEW PHASE IN THE QUEST TO FIND FOOTROT-FREE FINE-WOOL SHEEP

FeetFirst

Dr Mark Ferguson

Sampling

Another huge thank you to all growers who have made their sheep available for FeetFirst sampling. Several new properties have joined the project since the last FeetFirst update in May, taking the total numbers of FeetFirst properties to 65.

We have complete sets of samples from 45 properties (these include a range of fine wool flocks from across the South Island – 42 Merino, one Polwarth, one SAMM x Merino and one Dohne x Merino). Each complete set includes DNA samples from both 'clean' (those without footrot) and 'dirty' sheep (those with footrot).

An additional 20 farms have sampled their 'dirty' sheep and are now waiting for their 'clean' sheep to go through another footrot challenge before DNA samples are taken from the sheep that remain footrot-free.

We are still working towards a target of 8,000 samples (100 properties).

If you suspect a footrot outbreak on your property, or someone you know would like to be a part of the project, contact Brenna Sharland (03 335 0911/ brenna.sharland@nzmerino.co.nz) or your FeetFirst vet to arrange a visit. This is especially important for any growers who have had a change in their flock's footrot status with the recent wetter weather.

Look at the checklist below to see whether your sheep meet the FeetFirst criteria.

WHO CAN BE INVOLVED?

If you can tick all of these boxes, you can be involved in FeetFirst:

- ☐ I have a mob of sheep with footrot.
- ☐ The sheep have not received footvax in the previous 12 months.
- ☐ The sheep have not been treated with an antibiotic in the previous 2 months.
- ☐ They are at least 6 months old and are from Merino bloodlines.
- ☐ There are times through the year that the sheep go for greater than 4 weeks without a footbath.

FeetFirst Protocol

Contact Brenna Sharland if you would like a copy of the full FeetFirst protocol:
- 03 335 0911
- brenna.sharland@nzmerino.co.nz

FeetFirst genotyping and analysis (gBV development)

FeetFirst is entering an exciting 'make-or-break' phase. More than 3,500 DNA samples have been collected and sent to AgResearch to be genotyped on 50K SNP chips. The genotype data has been provided to AGBU in Australia, and will be matched with the phenotype data (whether or not the sheep had footrot at the time of sampling). This preliminary analysis will provide an indication of whether a genomic breeding value (gBV) can be developed.

Depending on the outcomes of the preliminary analysis, a decision will be made as to whether further sampling will be required to develop a footrot gBV. We expect one of the following scenarios from the preliminary analysis:

Best case: The data shows a significant genetic difference between the infected and non-infected sheep. We are able to proceed with developing the gBV for footrot, with further FeetFirst sampling required for validation only.

Next best case: The data indicates a genetic difference between the infected and non-infected sheep, but further sampling, genotyping and analysis is required before we can proceed with developing the gBV for footrot. The FeetFirst teams will continue to work with growers to collect further samples. Additional SNP chips will be purchased for genotyping the new samples.

Inconclusive result: The data is inconclusive as to whether there is a genetic difference between the infected and non-infected populations. Further sampling, genotyping and analysis would be required to determine whether there is potential for developing a gBV for footrot. A decision would need to be made about the feasibility of continuing with the project.

Negative result: The data shows that there is no genetic difference between the infected and non-infected populations. The project would be discontinued.

Based on current timeframes, it is expected that a 'stop / go' decision about FeetFirst will be able to be made before the spring footrot challenge.

We will bring you a further update once we have the results of the preliminary analysis.

If the results are positive, the next stage of the project will involve incorporating the information from each sheep into the Merino Select database to generate a gBV for footrot. Once the gBV is developed, the power of breeding values will enable breeders to make (and measure) genetic gain across their flocks in this critical animal health trait.

Pending the results from the preliminary analysis, we are developing a plan to maintain the accuracy of a footrot gBV into the future. Given the evolving nature of genetics, it will be necessary to continue to challenge a fine wool sheep population with footrot each year, recording the phenotypic performance and genotyping the new population. The progeny from the central progeny test (CPT) have been identified as an ideal reference population, given the range of industry genetics available within the CPT. In addition, stud breeders that footscore their flocks and submit their data to Sheep Genetics will further validate the gBV. These two approaches will build the accuracy of the gBV over time.

RELATED PROJECTS

Central progeny test (CPT)

The 2013 progeny will be challenged with footrot as yearlings. The results will be used to validate both the footrot gBV (see FeetFirst genotyping and analysis – gBV development above) and the Lincoln Footrot Gene Marker Test (see the May 2014 FeetFirst update – link included below). We look forward to bringing you further updates on these two projects in the coming months.

The initial footrot challenge results for the wether hoggets will be presented at *Designer Genes* (the CPT open day) on Thursday 24 July in Amberley. Please see the attached invitation for more information about *Designer Genes*.

Sire genotyping

Over the last few months we have been working with stud breeders to collect DNA samples from any new stud rams used during the 2014 breeding season. AgResearch extract the DNA from each sample and genotype each ram using 50K SNP chips. From this work a reference population is being formed for the FeetFirst project. If a gBV for footrot is successfully developed, this reference population will enable us to rapidly find sires within the industry with genetic resistance to footrot.

Training opportunities

We are developing a new animal health workshop for fine wool sheep breeders called Healthy Ewes Healthy Profits. The focus of the workshop will be on improving ewe health to increase on-farm profitability from ewes (and their progeny). The workshop will be piloted with growers in the coming year before being rolled out to the wider industry in 2015-16.

FeetFirst updates online

July 2014: http://www.perfectsheep.co.nz/assets/Uploads/FeetFirst-update-Jul-2014.pdf.

May 2014: http://www.perfectsheep.co.nz/assets/Uploads/FeetFirst-update-May-2014.pdf.

January 2014: http://www.perfectsheep.co.nz/assets/Uploads/FeetFirst-update-Jan-2014.pdf

Contact

If you have any questions about any of these projects, please feel free to contact:

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mark.ferguson@nzmerino.co.nz

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