Sheep CRC Practical Wisdom Notes

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SHEEP CRC
Sheep CRC Practical Wisdom
Know it. Do it.

Sheep CRC genomic test for terminal breeds —what are the benefits?

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Key points

- Genomic tests increase ASBV accuracy and, therefore, rate of genetic gain.
- Genomics provides valuable information on hard-to-measure meat traits, including lean meat yield and intramuscular fat.
- Genomics will allow terminal ram breeders to simultaneously select for improved eating quality and lean meat yield.
- Using current selection indexes, there are modest potential increases in the rate of genetic progress for standard traits through use of genomic tests.

Introduction

Genomic testing offers terminal ram breeders substantial potential opportunity to identify and select rams that are superior for lean meat yield (LMY) and eating quality traits. To date, terminal ram breeders have successfully used current selection indexes and measurements for growth, muscle and fat depth to achieve substantial genetic gain. It is expected that clearer price signals will develop for LMY and eating quality in the medium term.

The Sheep Genomic test developed by the Sheep CRC provides information on many traits including LMY and eating quality traits. The Sheep Genomic test will allow breeders to incorporate selection for LMY and eating quality, for which there was previously limited information.

What increase in genetic gain can genomic tests offer?

The likely largest benefit of genomic tests for terminal ram breeders lies in the ability to make selection decisions based on information for hard-to-measure traits. For example, genomics increases the accuracy of selection for traits that could not be routinely measured before including eating quality. With the use of genomic testing, it is possible for these traits to now be considered in the selection process, since genomic breeding values can be predicted with some accuracy for these traits.

The Sheep Genomic test generates breeding values for three new and important carcase traits: lean meat yield (LMY), intramuscular fat (IMF) and shear force (ShearF5), the latter two are associated with eating quality. Breeders who use a Sheep Genomic test are receiving Research Breeding Values from Sheep Genetics for these traits with accuracies typically between 40% and 50%. This is sufficient accuracy to make selection decisions.

If initial selection is based on traits such as post weaning weight, post weaning eye muscle depth and post weaning fat, which can be readily recorded, but may have unfavourable genetic correlations with hard-to-measure traits such as eating quality, then there is a risk that genetic merit for eating quality may decline.

Breeders are already adopting the use of genomics as a tool to screen young rams, so they can improve both traits. Testing approximately 20% of the ram drop and incorporating carcase trait ASBVs into selection will allow producers to simultaneously improve eating quality (through higher intramuscular fat) and lean meat yield.

For terminal ram breeders already conducting extensive performance recording there are currently modest increases in accuracy for most ASBV at time of selection when using genomic testing. For example, increases in accuracy for weight and carcase traits were between 5 and 7% percentage points, however, post weaning worm egg count had a substantial increase, going from 30% to 40% accuracy. Overall, the use of genomics was predicted to increase rate of gain by 3% for the Lamb 2020 selection index.

These small predicted increases are because many of the traits in the Lamb 2020 selection index can be recorded on the animal prior to selection at 6 months. This results in a relatively high ASBV accuracy at time of selection even without the use of genomics.

Which animals should be tested and when?

Test the best 20% of rams

In flocks that already do extensive performance recording, testing the best 20% of the ram drop is expected to give approximately 80% of the potential additional genetic gain compared with testing the entire ram drop when rams are first selected at 6 months.

Test more rams than you will need

Test more rams than you need as replacement sires so that the test results can be used to narrow your selection. Testing only the number of replacements that you need means you have already made your selection and the genomic tests will add no more gain than what you could achieve without them.

Test from a number of progeny bloodlines

Sample animals from a number of progeny bloodlines or family groups to widen your pool of future sires, to maintain sufficient genetic diversity and avoid future inbreeding.

Take home messages

- The Sheep CRC Sheep Genomic test gives information on many traits.
- There are now lean meat yield and eating quality breeding values that are informed by the Sheep Genomic test.
- The Sheep Genomic test increases ASBV accuracy for young rams and for traits that are measured later in life.
- General testing recommendations for the ram breeder
    - Test animals prior to selection.
    - Test more animals than you need, about 20% of the ram drop.
    - Consult with an advisor to optimize your testing strategy.

Further information

Sheep CRC website: www.sheepcrc.org.au, then choose Genotyping tests

Sheep CRC Practical Wisdom notes:

- Genomics and DNA testing: new tools for ram breeders to accelerate genetic gain.
- Sheep CRC genomic test for Merinos—what are the benefits?
- Sheep CRC genomic test for maternal breeds—what are the benefits?
- Breeding towards a poll flock with the Sheep CRC Poll test.
- New Breeding Values for Yield and Eating Quality technical note.

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