Benefits of using HornPOLL for Sheep

- In a breeding programme, breeders will be able to identify and eliminate poll or scurred rams that can produce progeny with horns.
- The culling of carrier sires will reduce the need to cull progeny with horns or scurs, therefore maximising the number of elite progeny suitable for selection, and genetic gain..
- Horns and scurs are generally considered an undesirable trait and are usually selected against in most breeds. A DNA test to identify animals that are less likely to develop horns or scurs is beneficial as:
  - o Horns on sheep, especially rams, can make handling more difficult, dangerous, and time-consuming.
  - o Horned animals are not suited to many commercial operations where they can get their head stuck in fences, feeders and equipment.
  - o Attempting to eliminate the presence of horns through crossbreeding and out-crossing can lead to a loss of other desirable traits.
  - o Processors are becoming more aware of potential carcase damage caused by horned animals.

Validation

HornPOLL was discovered in a New Zealand population of Merino x Romney sheep (backcrossed to Merinos) and refined in another resource containing many breeds. It was then validated in an independent Australian Merino population and a Wiltshire resource. This validation confirmed that the HornPOLL test had an accuracy of >99% in the two validation populations examined.

There are however some exceptions. In Scandinavian breeds (especially the Finn), the HornPOLL test is not as accurate, as some animals receiving a “poll” result develop scurs. Therefore, the current test may not be accurate in flocks where Scandinavian breeds have been introduced. In addition, the validation has not included breeds of African or Asian origin.

HornPOLL

DNA Test for Sheep

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What is HornPOLL?

HornPOLL is a new DNA test from Pfizer Animal Genetics that is used to identify the probability of an animal carrying zero, one or two copies of the poll gene. This is useful in making breeding decisions when trying to reduce the frequency of horned animals in your flock.

Poll-ness described

Poll sheep are those without horns. In some sheep breeds there are horned and poll animals. Scurs, which are partial or underdeveloped horns, are also seen in some breeds of sheep.

The development of horns in sheep is under the control of a number of genetic factors, including the breed and the sex of an animal. Some sheep breeds have horns on rams and ewes, in others horns are observed only in rams and in some breeds horns may or may not be observed on ewes. Crosses between poll and horned sheep can produce offspring that are poll, horned or scurred due to the complex nature of this trait.

Interpreting HornPOLL results

The HornPOLL DNA test identifies:

- Animals that have two copies of the poll allele* (homozygous poll) and will be naturally poll
- Animals that have one copy of the poll allele (depending on other factors these animals may have a horned, scurred or poll phenotype)
- Animals that have no copies of the poll allele (and will be horned or scurred)

The results also report the probability of an animal being one of the three types described above. The probability estimates are given as a range from 50% to 95%.

* An allele is a version of a gene.

HornPOLL

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HornPOLL Result	Likely Phenotype	Explanation
Double copy Poll	Poll	There is a high likelihood that this animal has two copies of the poll allele (also called homozygous poll).
Single copy Poll	Variable expres-sion	There is a high likelihood that this animal has one copy of the poll allele, and will have one copy of the horn allele.
No copy Poll	Horn or scur	The animal tested does not carry any copies of the poll allele.

The results are indicative of the phenotype the animal will display. Because the horns trait is complex and not controlled solely by the number of copies of the poll allele that an animal has, in some cases the phenotype of a tested animal or their progeny will be unexpected.

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