Getting your sheep tested

Testing will be performed by the Lincoln University Gene-Marker Laboratory. If breeders and farmers contact the testing laboratory at the numbers listed then we will send out special cards for collecting small blood samples, along with instructions on how to easily and safely collect blood from sheep. Only when these cards are returned to us will typing be undertaken.

Testing cost

A separate schedule of prices is available on request. Discounts apply for multiple tests carried out in a calendar year (1 January – 31 December) and for testing done together with other gene tests provided by the Lincoln University Gene-Marker Laboratory.

Disclaimer

Lincoln University and the Lincoln University Gene-Marker Laboratory cannot be held responsible for the outcome of any decisions made by breeders in the breeding of sheep using this DNA-typing technology. The genetic information supplied to breeders may only be used by them on the assumption that they assume responsibility for any loss, damage or consequence resulting directly or indirectly from the use of that information. The liability of Lincoln University and the Lincoln University Gene-Marker Laboratory is limited to re-testing individual sheep where an error has been made at some stage of the DNA testing process.

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Photos by Dianne Calvert and Alistair McLeod

T+ Muscling
Gene Test

Want to find out more?

www.lincoln.ac.nz/gene-marker-lab

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T+ muscling gene test

Double-muscling in sheep is found primarily within the Texel breed and crosses of that breed. It occurs because of variation in the myostatin gene. Double-muscling has also been described in other breeds and while, strictly speaking, these sheep do not have twice as much muscle, they typically produce carcasses with increased lean meat yield.

In Texel sheep, double-muscling is controlled by a gene (called the myostatin gene) that is found on one of the non-sex chromosomes (ovine chromosome 2). Double-muscling occurs because of variation in the gene that is scientifically described as c.*1232G›A (originally designated as g+6723G›A or g+6223G›A). The following website links describe some of the science underpinning our knowledge of the gene, the genetic variation and its function.

http://www.ajas.info/Editor/manuscript/upload/23-112.pdf
http://www.nature.com/ng/journal/v38/n7/abs/ng1810.html
http://www.ajas.info/Editor/manuscript/upload/21-129.pdf

Selection for one form of myostatin (called c.*1232A) can be used to increase muscling in Texel sheep and Texel-cross breeds, and thereby increase carcass meat yield.

The Lincoln University Gene-Marker Laboratory has developed a gene-typing system for c.*1232G›A and called the form of the gene that improves muscling 'T+ muscling'. The 'T' stands for Texel. We are offering a DNA typing service to sheep breeders who use Texel or Texel-cross genetics.

The test

Blood samples collected from sheep can be 'typed' to reveal whether they carry one or two copies of the T+ muscling form of the myostatin gene.

In our typing system we report the results simply as 'T+' or '–', as follows:

(-, -)	**–**	**non-carrier**
(T+, -)	**–**	**single copy**
(T+, T+)	**–**	**double copy**

Sheep have two forms of the myostatin gene or two 'alleles', reflecting that they have paired chromosomes and inherit one allele from each parent. They can therefore pass each allele on to their progeny in approximately a 50:50 ratio. The 'flow' of alleles can thus be followed through extended pedigrees of sheep.

The test allows you to identify sheep that carry the beneficial T+ allele of the myostatin gene.

Breeding with sheep that are carriers

This gene test allows breeders and ram-buyers to monitor whether their sheep are carriers of the beneficial T+ muscling allele (1 or 2 copies) and whether they might produce offspring carrying the allele. It is effectively a breeding management tool, as carrier sheep can be used to improve meat yield.

We recommend the following approach when using this technology:

- That breeders place their main emphasis on testing breeding stock, especially rams, as they typically have the most impact on a flock genetically.
- That breeders keep precise pedigree records of all genetic testing so as to be able to follow the beneficial form of the gene in their flock
- That the test is used conservatively in the context of the 'golden rule' of genetics, whereby selection for multiple traits limits genetic gain for any given trait. In this context care needs to be taken in culling any sheep (e.g. non-carriers) as they may have genetic merit for other traits. Breeders should always be cautious about overly narrowing their genetic 'base', as this will reduce diversity and may reduce their ability to make genetic gain in other traits
- That non-carrier sheep could be removed from breeding programmes at the first practical opportunity by putting them to terminal sires.