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## Using Myostatin Information To Select Limousin Cattle



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# Introduction

Myostatin - double muscling - in Limousin cattle (and many other beef breeds) is not a new phenomenon and DNA tests for Myostatin are now easily available. Underlining their commitment to on-going breed improvement and their service to buyers, the British Limousin Cattle Society and Limousin breeders now publish all Myostatin test results.

- **For breeders**, knowing the Myostatin status of animals within herds will be important for the choices and options it offers herd management and breeding programmes.
- **For purchasers**, and across the industry, it will similarly allow choices to be made based on knowledge and understanding when buying Limousin cattle.

This information leaflet explains what Myostatin is and how the information can be used in herds.



# What is Myostatin?

The Myostatin gene is found in all mammals and influences the production of a protein that controls muscle development. Natural mutations of the gene produce proteins that are less effective at controlling muscle development, which results in increased muscle mass. There are three main mutations that occur within all Limousin populations (as well as other breeds); they are carried in pairs and differ in their effects as follows:

## F94L

Animals with two copies of this gene (ie F94L/F94L) exhibit an increase in muscling (by up to 19%) with no associated increase in calving difficulty, lowered fertility or longevity and by far the majority of animals in the breed carry this gene. Heterozygous animals (those with one copy of the gene) also exhibit these characteristics but not to the same degree.

As a result of the high frequency of this gene in the Limousin population, most animals have double copies and exhibit its characteristics; increased muscle mass without increased calving difficulties, lowered fertility or longevity. It is therefore partly responsible for the breed as it is today and one of the reasons behind its commercial success.

## NT821

This variant is carried by a lower proportion of animals in the breed. Animals with two copies of the gene (ie nt821/nt821) will exhibit characteristics of the condition: larger loin depths, reduced fat depths and large, rounded rump and thighs. However, unlike F94L, animals with two copies may also have slightly heavier birth weights bringing with it the potential for more difficult calvings. If animals are 'heterozygous' with F94L (ie F94L/nt821) they will still exhibit quality carcass characteristics but are less likely to be affected by more difficult calvings.

## Q204X

As with nt821, Q204X is carried by a small proportion of animals in the breed. Animals with two copies of the gene (ie Q204X/Q204X) will exhibit characteristics of larger loin depth, reduced fat cover and greater meat tenderness. However, they may also have the potential to exhibit larger birth weight and, if females, slightly reduced milking ability. Animals that are 'heterozygous' with F94L (ie F94L/Q204X) will still exhibit quality carcass characteristics but are less likely to be affected by larger birth weights and reduced milking ability.

**Two further variants of Myostatin exist within the Limousin population** but are relatively uncommon in their occurrence. Known as nt419 and E291X, their effects in homozygous and heterozygous states are similar to nt821 and Q204X respectively.



# What are the Benefits of Myostatin?



The recognised benefits of Myostatin are:

- **Increased Meat Yield** – by up to 19%.
- **More feed efficient**
- **Higher meat quality** – increased tenderness, reduced fat content, higher polyunsaturated fats

On a population level, because of the high frequency of F94L, there are no significant disadvantages to the presence of the Myostatin mutations.

Some difficulties may present themselves at individual animal and herd level, however. If animals carrying nt821 and Q204X are mated to animals that are

carrying the same mutations, it does increase the potential to increase birth weight and reduce milk. Whilst this can be managed – and very successfully so – it is lack of knowledge of an animals' status that is a barrier to this and therefore the main disadvantage currently.

**Knowing what the genotypes of breeding stock are will help pedigree and commercial producers select animals for the best possible outcome and will allow all herds to set and achieve breeding goals that capture the beneficial characteristics they bestow.**



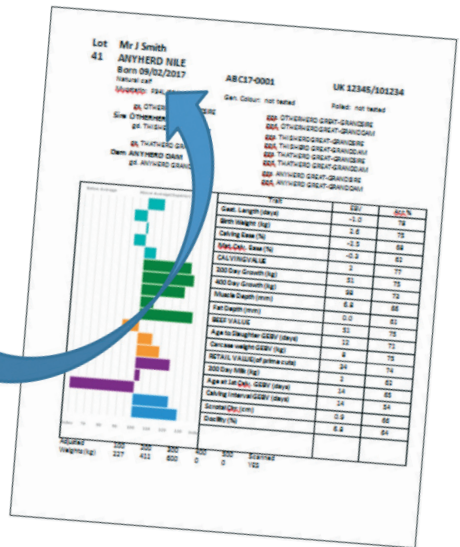
# How Should Myostatin Information be Used when Buying A Bull?

**An important factor to remember is that carcase traits (muscling, fat cover etc), calving traits and milk traits in cattle are controlled by MANY genes. Myostatin is only one of them and, as such, it is not an absolute predictor of an animal's performance.**

A Myostatin genotype is a further bit of information that may help your decision, but it should be used in conjunction with wider information such as Estimated Breeding Values (EBVs), which bring together information of actual performance from the animal itself, its herdmates and its relatives to predict genetic merit, and your own judgment on type and pedigree.

The testing and publication of Myostatin genotypes is carried out at by breeders on animals of their choice. All results are published on the Limousin database ([www.taurusdata.co.uk](http://www.taurusdata.co.uk)) at Society sales and in other relevant Society literature.

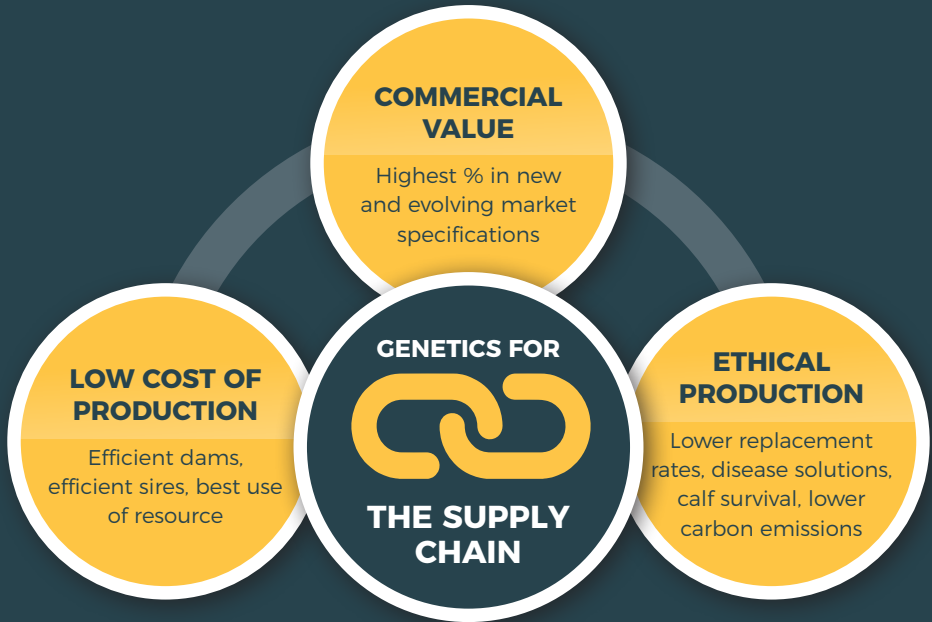
The aim of providing this information to industry is to further enhance all Limousin breeders' and buyers' knowledge of the potential performance of the stock they are selecting. Coupled with the wealth of wider performance



information available, it demonstrates the commitment by the Society and its members to providing the market with animals that will produce fast growing, quality carcasses that are easily born with heifer replacements that make quality suckler cows - now and in the future.

For further information please get in touch or see our website [www.limousin.co.uk](http://www.limousin.co.uk)

# LIMOUSIN: BUILDING THE FUTURE



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