

Ram DNA Scheme - Understanding the Results

All members are invited to test their rams - shearling rams or stock rams. They must be registered. For shearling rams, the sample must be sent at the time of Registration.

DNA samples are to be collected by the breeder at home.

Sample kits (nasal swabs) can be obtained from the Society Office. There is a charge for the DNA kits and for the DNA analysis by Neogen which is publicised annually.

The information below is to help you translate the results.

Please note that all the information given here is for advice only. The Lleyn Sheep Society accepts no responsibility for the outcome.

Note that (rarely) no results can be obtained. In this case, a new sample would need to be submitted.

SCRAPIE GENOTYPE		
Scrapie is a neurodegenerative disease primarily affecting sheep and goats. Symptoms are usually not apparent until later in life so the infection status can only be determined by testing. There is no known treatment and no vaccines are available.		
Scrapie Resistance or Susceptibility	ARR/ARR	Most Resistant
	ARR/AHQ	Resistant but requires careful breeding selection
	ARR/ARH	
	ARR/ARQ	
	AHQ/AHQ	Little Resistance and requires careful breeding selection
	AHQ/ARH	
	AHQ/ARQ	
	ARH/ARH	
	ARH/ARQ	
	ARQ/ARQ	
	ARR/VRQ	Susceptible
	AHQ/VRQ	Highly susceptible
	ARH/VRQ	
	ARQ/VRQ	
	VRQ/VRQ	

MYOSTATIN STATUS	
G/G	Wildtype = Non-carrier. Sheep have 'standard' level of muscle.
A/G	Carrier = has one copy of the Myomax gene. The ram has 7% more muscle than non-carriers. He will pass on one copy to half of his progeny (both male and female). The lambs have a 50% or 100% chance of inheriting a second copy from the dam, if she is a carrier with one or two copies herself.
A/A	Double Muscled = has two copies of the Myomax gene. The ram has 14% more muscle than non-carriers. Every lamb from this ram will inherit one copy of the gene. The lambs have a 50% or 100% chance of inheriting a second copy from the dam, if she is a carrier with one or two copies herself.

PROLIFICACY STATUS

The Lleyn's reputation for being prolific is based on a proportion of the ewes (around 5-15%) carrying one of the naturally-occurring prolificacy mutations in the breed (FecX(G) or FecG(H)). Most Lleyn rams do not carry either prolificacy gene but it is important that some do. Otherwise, the Lleyn breed would settle down to lambing around 170%.

Gene carrier rams should NOT BE PUT TO PROLIFIC EWES who may be carriers themselves. They should be used on ewes that normally give singles to minimise the chance of sterile offspring.

FecX(G) carriers normally give twins and triplets while FecG(H) carriers can give multiples (quads and more) and are, therefore, less desirable.

FecX(G)	G/G	Wildtype = Non-carrier. If the ram is put to ewes which have not inherited prolificacy genes from their dams, the ram's daughters will give the normal 170% lambing that non-gene carrying Lleyn ewes produce.
	A/A	The ram is a carrier of the gene . As the mutation is on the X-chromosome, ALL his daughters will inherit the gene from him and they could average 220-240% lambing. NONE of his sons will inherit the gene from him.
FecG(H)	G/G	Wildtype = Non-carrier. If the ram is put to ewes which have not inherited prolificacy genes from their dams, the ram's daughters will give the normal 170% lambing that non-gene carrying Lleyn ewes produce.
	A/G	The ram is a carrier of the gene . As this mutation is not on the sex chromosome, the inheritance by both sons and daughters will be random and unpredictable. The gene will be passed on an average of 50% of the time. Carrier daughters could average 270-290% lambing.
	A/A	Carrier of two copies = homozygous carrier. Not seen in practice.

RESISTANCE/SUSCEPTIBILITY to MV

Maedi Visna is one of the (eventually fatal) 'iceberg diseases'. Symptoms are usually not apparent until later in life so the infection status can only be determined by testing. There is no known treatment and no vaccines are available. The MV Accreditation Scheme helps 'ringfence' non-infected sheep **BUT accredited animals are at risk as soon as they enter a non-accredited environment.**

Some animals are much more resistant than others and they can be identified by genetic testing. Selecting replacements carrying desirable genetics can decrease susceptibility to MV.

The four most common genetic haplotypes (one inherited from the sire, one from the dam) are denoted 1, 2, 3 and 4. **Haplotypes 1 and 4 have been shown to confer 70 times less susceptibility/more resistance than others.** Therefore, diplotypes 1,1, 1,4, 4,1 and 4,4 are desirable. Haplotypes 2 and 3 (even in combination with desirable haplotypes) indicate high susceptibility.

Diplotype Result	Resistance/Susceptibility
1,1 or 1,4 or 4,1 or 4,4	Less susceptible = More resistant (desirable)
1,2 or 2,1 or 2,2 or 2,3 or 3,2 or 2,4 or 4,2 or 1,3 or 3,1 or 3,3 or 3,4 or 4,3	Highly susceptible
Other minor haplotypes and combinations	Unknown