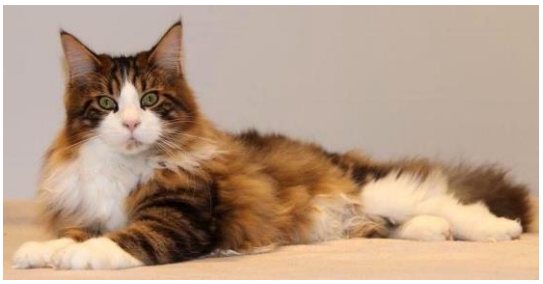
Spinal Muscular Atrophy

About the disease



Spinal muscular atrophy (SMA) is a genetic disorder of Maine Coon cats.

It causes the loss of spinal cord neurons (nerves) that control muscles in the limbs. This leads to muscle weakness and clinical signs become apparent by 3-4 months of age.

Affected cats develop an abnormal gait and by 6 months of age are typically too weak to jump correctly. Affected cats can live relatively normal lives indoors and appear not to be in pain.

The mutation is inherited as an autosomal recessive trait, meaning that two copies of the mutant gene are required for SMA to develop.

About the test

At the Molecular Diagnostic Unit, we have developed a PCR-based assay to quickly and accurately identify the SMA mutation in Maine Coon cats.

This assay will allow owners and breeders to identify Affected and Carrier cats and will enable them to form breeding programs to reduce SMA in their kittens.

Interpretation of results

A **Normal** spinal muscular atrophy genetic test result means that the cat does not have the known genetic mutation causing spinal muscular atrophy in Maine Coon cats.

A **Carrier** spinal muscular atrophy genetic test result means that the cat has one copy of the spinal muscular atrophy mutation. The cat will not have spinal muscular atrophy but may pass the mutation to their offspring.

An **Affected** spinal muscular atrophy genetic test result means that the cat has two copies of the spinal muscular atrophy mutation. The cat will have spinal muscular atrophy.

Each certificate we issue will specify whether the cat is Normal, Carrier or Affected for the known spinal muscular atrophy mutation found in Maine Coon cats.

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The gene test will help breeders decide whether or not to use cats for breeding. Generally Affected cats should not be used for breeding because they are certain to pass on the genetic mutation. There is a 25% probability of two Carrier (Heterozygous) cats producing Affected (Homozygous) kittens. Breeding Carrier and Normal cats will produce around 50% Normal and 50% Carrier kittens.

This strategy can be used as part of a breeding programme to gradually eliminate the defective gene from the affected populations.

FAQs

What are the genetics of breeding?

	Carrier		
	+	-
Carrier +	+/+ Affected	+/- Carrier
Carrier -	+/- Carrier	-/- Normal

Autosomal Recessive
SMA is inherited as an autosomal recessive trait, meaning that two copies of the defective gene are required in a cat to produce the disease.

Carrier cats (those with a single copy of the defective gene; heterozygous) do not develop SMA. However, breeding from two Carrier cats has a 25% chance of producing Affected kittens and a 50% chance of producing more Carrier cats.

Therefore, it is NOT recommended to breed two Carrier cats together, since this can produce Affected kittens.

What do I do with a Carrier?

	Carrier		
	+	-
Normal -	+/- Carrier	-/- Normal
Normal -	+/- Carrier	-/- Normal

Breeding is still possible
It is possible to continue to use Carrier cats in breeding programmes to retain important breeding lines and to avoid reducing the size of the gene pool.

As long as Carrier cats are mated to Normal cats no Affected kittens will be produced. This mating is likely to produce kittens that are Carriers, which can be identified by genetic testing and, if necessary, future matings arranged with Normal cats.