



DEGENERATIVE MYELOPATHY

Kate Watkins and Judy Creswick attended the Kennel Club's Breed Health Coordinators' symposium on 4th October 2017 on behalf of Soft-Coated Wheaten Terriers. One of the topics they were particularly seeking information about was the gene for canine degenerative myelopathy (DM). How common is it? How is it viewed by geneticists?

In the afternoon there was an opportunity to discuss DM with different experts in canine health matters. Dr. Dan O'Neill, a Companion Animal Epidemiologist from the RVC, working entirely as part of the VetCompass programme <https://www.rvc.ac.uk/vetcompass>, and Dr. Brenda Bonnett from the International Partnership for Dogs <https://dogwellnet.com/> were consulted as both organisations are involved in collecting health data from vets.

The DM gene has been identified by the University of Missouri in some 30 different breeds at the last count. It is not a breed specific gene test for the Wheaten. Our predisposing gene for PLN, on the other hand, is a gene that extensive research at the University of Pennsylvania has shown to be specific to Soft-Coated Wheaten Terriers and relevant only to the Wheaten version of Protein Losing Nephropathy.

At the beginning of July 2017, Laboklin Laboratories reported that 200 Wheaten DM DNA samples from Europe had been processed: 38% had no copy of the DM gene, 47% had one copy, 15% had two copies. The limited number of cases of 'failing back legs' identified by veterinarians as DM in the Club's health files, even including the suspected cases, do not tally with the sort of prevalence suggested by these figures. Also, there are only limited family links between the various historic cases in our files.

Breeders please note: Although care needs to be taken, the two experts suggested that the DM gene is of somewhat lesser importance as part of a breeding decision. Dr. Bonnett said that the gene for DM appears to be very prevalent in many dog breeds (as well as wolves). Dan O'Neill was very forceful when he said, "it would be dangerous, at this moment in time, to use the DM test to unduly influence breeding decisions until the implications are fully understood".

There has been much discussion on the Internet and Facebook regarding this DM DNA test. DM is not a gene with the same importance for Wheatens as the PLN gene which, as mentioned above, is Wheaten specific. DM is a general canine gene which has probably been around in Wheatens as in other breeds for many years. DM is a cruel disease but one which we have not seen often, even with the increasing longevity of Wheatens.

We can do much damage to the future health of our breed by breeders taking too much notice of the DM genetic results for their individual dog. As the discovery of the DM gene is relatively new, we do not yet know the true prevalence of this gene in the UK Wheaten or its relation to the number of cases of DM that may be diagnosed in the future. This is something that needs to be investigated and hopefully the 2018 AGM will agree to such a project. As the saying goes, "let's not throw the baby out with the bathwater". Breeding an 'affected' (two copies of the DM gene) to another 'affected' is probably not sensible, but use of carriers should definitely be considered.

The most valuable thing we can do as a breed, is to collect information about the frequency of the affected DM alleles in our dogs. If you decide to test, or have tested, as an owner or breeder, the DNA of your dogs, we would ask you to please share your results, anonymously if preferred, with the SCWT Club of GB's health team: health@wheaten.org.uk

A note on breeding from carriers and affected dogs: The Kennel Club Breeding only from clear dogs can have a significant impact on genetic diversity within a breed, increasing inbreeding and therefore the likelihood of new inherited diseases emerging.

With simple autosomal recessive disorders*, a carrier will not be affected by the condition you have tested for, but they could pass on a copy of the faulty gene if they themselves are bred from. Only when a dog inherits two copies of a faulty gene (one from its mother and one from its father) will it be affected. When used responsibly, carriers are an important part of any breeding plan and should not be overlooked. By breeding from carriers, you can keep good, healthy dogs in the breeding population, helping to maintain genetic diversity. Ultimately however, over the course of a few generations it would be beneficial to aim to produce only clear puppies, thereby reducing the frequency of the disease-causing variant of the gene in the breed.

Similarly, an affected dog could still be used in a breeding programme, but this will very much be dependent on the condition and whether the dog's welfare would be affected by the mating/whelping process. They should only be mated to clear dogs, to ensure no affected puppies are produced.

Clear dogs are only known to be clear for the condition that they have been tested for and may carry other unknown mutations which can be passed on to their offspring – it is almost certain that all individuals carry some versions of genes that if inherited in duplicate would result in disease. If an individual dog has many offspring that go on to breed themselves, these unknown mutations may then increase in frequency in the breed and a new inherited disease could emerge. In other words, no dog is completely risk-free, but there are ways a breeder can reduce the risk of known and unknown inherited disease.

*The DM gene appears to be autosomal recessive. It also appears to behave similarly to the PLN gene as a dog with two copies of the gene does not necessarily develop DM.

A basic rule of the universe – nothing's perfect.
(Stephen Hawking)