Copper Toxicosis

Affected breeds: Bedlington Terrier

Copper Toxicosis is a condition which affects a number of dog breeds and results in increased levels of copper in the liver due to a reduced ability to excrete copper effectively. Although small amounts of copper are required for normal metabolism, abnormally high levels are extremely toxic. Dogs affected with copper Toxicosis suffer from hepatitis, cirrhosis, and premature death.

A proportion of the Copper Toxicosis cases in the Bedlington terrier breed can be explained by the presence of a recessive genetic mutation in the COMMD1 gene. This mutation has been characterised and can now be tested for. The mutation is recessive, which means that dogs which carry the mutation ("CARRIERS") are normal but will pass the mutation on to an average of 50% of their offspring. Puppies which inherit two copies of the mutation will develop Copper Toxicosis ("AFFECTED").

This test is particularly useful for breeders:

- To identify carriers among their breeding stock so that they can avoid CARRIER X CARRIER mating combinations which would risk AFFECTED puppies.

This test will be reported as:
CLEAR* **:** no evidence of the COMMD1 mutation
CARRIER* **:** carries one copy of the COMMD1 mutation, which will be passed to 50% of offspring
AFFECTED **:** carries two copies of the COMMD1 mutation and will develop Copper Toxicosis

***Bedlington terriers affected with copper toxicosis have been identified which do not carry the COMMD1 mutation – other causal mutations are therefore presumed to be present in the population, and research work continues to identify these.

The genetic status of dogs can be used to predict breeding outcomes when different combinations are mated:

AFFECTED X AFFECTED	= 100% AFFECTED
AFFECTED X CARRIER	= 50% AFFECTED, 50% CARRIER
CARRIER X CARRIER	= 25% AFFECTED, 50% CARRIER, 25% CLEAR*
AFFECTED X CLEAR*	= 100% CARRIER
CARRIER X CLEAR*	= 50% CARRIER, 50% CLEAR*
CLEAR* X CLEAR*	= 100% CLEAR*

References

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