Fact Sheet for Breeders: Copper Toxicosis in Labrador Retrievers

Overview

Copper toxicosis (Labrador retriever type) is a genetic disorder affecting the liver's ability to manage copper levels, potentially leading to toxic accumulation. The degree of copper buildup can vary, and this variability may be influenced by environmental factors such as diet.

Genetic Testing

ATP7B Gene: Testing determines risk for elevated hepatic copper levels (Wilson disease).

This test is relevant for Labrador Retrievers, Doberman Pinschers, Black Russian Terriers, Bedlington Terriers, and related crosses.

- **Two Mutated Copies**: Increased risk of developing significantly elevated hepatic copper levels.
- **One Mutated Copy**: Increased risk of moderately elevated levels of hepatic copper, but lower than in dogs with two copies.
- **No Mutated Copies**: Lower risk, but other factors can still contribute to the disease.

ATP7A Gene: Testing determines risk for copper deficiency (Menkes disease). Mutation can also reduce copper accumulation in dogs with ATP7B mutations.

This test is relevant for Labrador Retrievers and related crosses.

- **Male Dogs**:
    - **One Mutated Copy**: Risk of having very low levels of hepatic copper. **OR** can be neutralizing if also carrying the ATP7B mutation(s).
    - **No Mutated Copies**: Not associated with altered hepatic copper levels.
- **Female Dogs**:
    - **Two Mutated Copies**: Increased risk of developing significantly lower hepatic copper levels. **OR** can be neutralizing if also carrying the ATP7B mutation(s).
    - **One Mutated Copy**: Increased risk of moderately lower levels of hepatic copper, but higher than dogs with two copies. **OR** can be neutralizing if also carrying the ATP7B mutation(s).
    - **No Mutated Copies**: Not associated with altered hepatic copper levels.

General: Dogs with combinations of both the ATP7B and ATP7A mutations show variation in hepatic copper levels depending on allele combinations and environmental factors.

Breeding Recommendations

- Breeding Strategy: Breed dogs with one ATP7B mutation to dogs that test clear. The ATP7A variant may help lower hepatic copper levels in some dogs, but it should not be relied on to cancel out ATP7B risk.
- Testing puppies from at-risk matings can help identify the best keepers for future breeding. Phasing carriers out over time, rather than removing all at once, may help retain genetic diversity in the breed.

Summary for Breeders

Testing: Regular genetic testing for ATP7B and ATP7A mutations in relevant breeds is recommended.

Breeding Decisions: Consider genetic diversity and the presence of mutations to manage copper toxicosis risk effectively.

Monitoring: Even with genetic testing, monitor all dogs for signs of copper toxicosis due to multiple influencing factors.

Maintaining a balanced approach to breeding, considering both genetic testing results and the overall genetic health of the breed, is crucial in managing hepatic copper levels in Labrador Retrievers.

Orivet Genetic Pet Care
info@orivet.com
PO Box 110
St Kilda VIC 3182

Head Office
03 9534 5560
Suite 102A | 163-169 Inkerman St.
St Kilda VIC 3182

USA Office
+1844-4ORIVET | usa@orivet.com
20 Church Street, Mezzanine Level
Hartford CT 06103