

Genetic tests in Alpine Dachsbracke dogs

(May 2019)

In 2012, [neuronal ceroid lipofuscinosis \(NCL\)](#) was diagnosed for the first time in an Alpine Dachsbracke dog. NCL is a recessively inherited metabolic disease of the nerve cells. The dogs affected by this disease go blind after about two years of age. Later on, there are significant changes in their character such as anxiety, aggression and epileptic seizures. In addition, the affected dogs lose their ability to orient themselves. The NCL cannot be cured and inevitably leads to death.

In 2018, a [spinocerebellar ataxia \(ATX\)](#) was diagnosed for the first time in four puppies from two related litters of the Alpine Dachsbracke dogs. ATX is a hereditary neurodegenerative disease that occurs early in life and is associated with movement coordination disorders, tremors and balance loss in puppies. ATX cannot be cured either and inevitably leads to death as a result of spongy degeneration of nerve cells.

Genetic tests were developed for both recessively inherited diseases, which allow a direct detection of the responsible mutations for these diseases, at the Institute of Genetics at the University of Bern (Prof. Cord Drögemüller). In healthy animals, the genetic test can be used to show whether they have no copies of the mutation and are therefore clear (**NCL-0** or **ATX-0**), or whether they carry one copy of the mutation (heterozygous) and are therefore carriers (**NCL-1** or **ATX-1**). In diseased dogs, the genetic test can confirm the presence of a disease by detecting two copies of the mutation (**NCL-2** or **ATX-2**; affected/homozygous).

The new gene test effectively helps to prevent the further occurrence of NCL- or ATX-affected Alpine Dachsbracke dogs. **Only the following pairings are recommended:**

genotypes of parent 1	genotypes of parent 2	average probability of offspring genotypes			
		NCL-0 + ATX-0	NCL-1 + ATX-0	NCL-0 + ATX-1	NCL-1 + ATX-1
NCL-0 + ATX-0	NCL-0 + ATX-0	100%	0%	0%	0%
NCL-0 + ATX-0	NCL-0 + ATX-1	50%	0%	50%	0%
NCL-0 + ATX-0	NCL-1 + ATX-0	50%	50%	0%	0%
NCL-0 + ATX-0	NCL-1 + ATX-1	25%	25%	25%	25%
NCL-1 + ATX-0	NCL-0 + ATX-1	25%	25%	25%	25%

Only the use of tested parents according to the above mating plan can prevent sick puppies from being born. These can only occur with a mating of carriers, therefore this is to be excluded.

Coat colors in Alpine Dachsbracke dogs

We would like to use the blood samples sent to us for the NCL/ATX gene tests for a future study on the inheritance of colors occurring in the Alpine Dachsbracke dogs. For this reason, it is important that the eye color and coat color of the dogs (dark or light deer red, lightly or strongly interspersed hairs, wolf grey, black with redbrown markings) are accurately described. In addition, please send photos of the dogs to Prof. Drögemüller at the Institute of Genetics at the University of Bern.

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