



THE WORKING KELPIE COUNCIL OF AUST INC.

PO Box 306, Castle Hill NSW 1765, Ph 02 9899 9224, Fax 02 9894 2140,

Email: admin@wkc.org.au Homepage: www.wkc.org.au

Cerebellar Abiotrophy (CA) — Kelpie Ataxias

Update July 2020

by Deb Maxwell BVSc

With tests now available for CA, the number of CA affected pups being born can be greatly reduced.

In every mating, for each CA type, one parent must be clear.

While research on Cerebellar Abiotrophy (CA) in Kelpies has been ongoing and tests developed, there are still unknowns. This article presents the knowledge to date, but continuing research and the data from wider commercial testing will build on this knowledge and may result in changes to tests and future recommendations.

Nevertheless, the current tests can greatly reduce the number of potentially affected pups.

The same disease variants may also affect ANKC Kelpies, Border Collies and Koolies, as well as crosses of these breeds, due to their common ancestors and occasional cross-breeding. Tests run by the researchers on about 200 Border Collies (mainly ANKC) did not show CA markers. Since the research, the Late- and Early-onset CA has been confirmed through commercial tests in some Border Collies; CA affected Koolies require testing to confirm these.

The full article is provided as separate PDF document (attached to the WKC Bulletin email) and provides considerable detail for interested readers, including more familiar Kelpie coat colour examples to help build understanding of the genetic and genomic concepts. The summary here contains the key messages.

Summary

- Cerebellar Abiotrophies (CA) are incurable, inherited diseases in Kelpies with the majority identified by three known and unrelated genetic markers.
- Signs include ataxia, high stepping [hypermetria], wide stance, incoordination, falling over, difficulty jumping onto objects, fine tremors, a nodding head, difficulty eating or drinking from a bowl, and, occasionally, seizures.
- The disease is not common, with the level of CA markers in the population remaining low, but two carriers may be chosen as mates and produce affected pups, and linebreeding/inbreeding can increase the chance of this occurring.
- Some affected dogs studied were not explained by these three markers; potentially there may be one or more other genes causing CA in Kelpies or there are other genes that affect whether the disease is fully expressed, or other markers may be better indicators, in particular, with the Early-onset variant.
- Dogs with a pair of CA markers are positive or “affected” and most will have signs of ataxia. Carriers only have one copy of any CA marker, and will not be affected.
- The extent of signs in affected dogs varies and is not yet able to be predicted; some dogs can live a relatively normal life; others will need to be euthanised.
- Signs in affected dogs vary in time of onset according to the CA variant: Early-onset from 4–8 weeks, Late-onset from 3–8 months (but sometimes later); the German type CA from 4–8 weeks.
- DNA tests are available to identify whether a dog has any of the markers for the three known CA disease variants, indicating clear, carrier or affected status.
- **The tests vary in their ability to identify affected and carrier dogs:**
 - For Late-onset CA, the test is believed to identify all affected and carrier dogs.

- **For Early-onset CA, the current test misses some dogs; any dogs that the current test identifies as carriers or affected, are carriers or affected, however some affected dogs with Early-onset CA used in the research were not identified by this marker.** DNA tested with the current marker contributes to CA, but may not be the direct cause. An alternative marker that appears to have higher predictive power is being studied.
- For the German type CA, very few dogs were in the study. Also, two dogs had tests indicating they were affected, but whether signs of CA appeared in them could not be confirmed.
- The DNA tests are currently only available through one Australian testing company: Dog Breeding Science, but this may change in the future.
- Tests can be used to greatly reduce the number of CA affected pups being born by including a clear result for every test, in every mating, every time.
- Carrier dogs with superior working ability do not need to be removed from the breeding pool, simply ensure that their mate is clear for the CA marker they carry.
- Carrier dogs do not show signs of disease; buyers of working dogs not intending to breed them should have no concern about their health.
- **Dogs with negative or “clear” test results should not be represented as CA-free** because there may yet be an unidentified CA variant, and the Early-onset and German CA tests may not be fully expressed or predict all affected dogs.