



Archiving DNA - Why Do It And What Does It Entail?

An increasing number of breed clubs are establishing DNA banks, or archives, to store DNA from dogs that are alive today for the benefit of the breed in the future. The Canine Genetics group at the Animal Health Trust is able to offer DNA Archiving facilities; enquiries should be made by a breed club representative to canine.genetics@aht.org.uk. This article answers frequently asked questions about what a DNA archive is, what the benefits are and what information needs to accompany each DNA sample for the archive to be of maximum benefit.

What is a DNA Archive?

A DNA archive, otherwise known as a DNA bank, is a collection of DNA samples from different individuals that are to be stored to an indefinite period of time. The DNA is collected with a view to using it for future research purposes, as and when it is needed. More information about what the DNA can be used for is included below in '*What can the stored DNA be used for?*'

Which dogs should have their DNA stored?

DNA from any dogs can be stored, but it is especially useful to store DNA from dogs that have or are likely to be bred from and dogs that are known to be closely related to dogs that are affected with inherited conditions.

What can the stored DNA be used for?

The stored DNA can be used for a variety of purposes. One important use for the DNA is to identify mutations responsible for inherited diseases; these diseases can be ones that are known about today or ones that might arise in the future. During a research project where a causal mutation is being sought it is often useful to analyse the DNA from affected dogs and from their parents and grandparents. For late onset conditions parents and grandparents may no longer be alive by the time an affected dog is identified, but if the DNA from those dogs had been stored then it will be

available to use long after the dogs have passed away. The AHT has developed at least one DNA test that was made possible by the analysis of DNA from dogs that had been stored for almost 10 years.

Stored DNA can also be used for general breeds studies, such as estimating the genetic diversity of the breed or the frequency of disease mutations in the general population.

How can the DNA be collected?

Ideally the DNA would be collected as a blood sample (~5mls) preserved in EDTA. However, in the UK, the Home Office has strict regulations restricting the drawing of blood for non-veterinary procedures, so owners should discuss this with their vet before requesting a blood sample solely for the purposes of DNA archiving. If a dog is having blood drawn for a veterinary procedure then a vet is permitted to draw a little bit extra for research purposes (which is how DNA archiving is classified) or to use any residual blood sample that is left over from the veterinary procedure.

Alternatively the DNA can be collected using buccal (cheek) swabs. Providing the instructions are closely adhered to it is usual to collect enough high-quality DNA for most research purposes.

What information needs to accompany each DNA sample?

The more information that accompanies each DNA sample the more useful it is likely to be. A DNA sample from a dog for which there is little information is unlikely to be of much use. It is usual to provide details such as the dog's name, breed, KC registration number, D.O.B., coat colour. You will also be asked for a copy of the dog's 5-generation pedigree and for any information about the health of the dog. Keeping the archive updated with any significant health changes is VERY IMPORTANT. For example, if we want to use a particular dog's DNA sample to study a specific inherited condition we need to know the dogs' clinical status with regard to that disease - in other words, we need to know if the dog is affected or unaffected or unknown. If a dog whose DNA is stored unfortunately develops any serious health condition it is very important that the owner informs the AHT so the dog's record is updated. Likewise, if the dog enjoys a healthy happy life and lives to be a ripe old age that is important information too! You do not need to submit a new DNA sample when you update the archive.

Both dog and owner information is kept in the strictest confidence, although the AHT might, periodically, distribute a list of the names of dogs whose DNA is stored to breed club representatives, for the purposes of sample monitoring. Only the names of dogs will be distributed and no other information will be included.

What does it cost to store DNA?

This varies. If the DNA is to be stored for research into a particular inherited condition, or for any other purposes for which funding has already been obtained, then the DNA can currently be stored free of charge. If the DNA is to be stored for unspecified, future purposes then the AHT asks for a donation of £5 per sample to help cover administrative costs. Details of how to submit a sample can be obtained by emailing canine.genetics@aht.org.uk. This is also the email to use to inform the AHT about a change in your dog's health.