

# DNA COLLECTION: AVOIDING SAMPLE FATIGUE

EDDIE DZUIK, *National Beagle Club*

## HEALTH COMMITTEE

The practice of selective breeding involves the process of enhancing desirable traits and weeding out undesirable ones. The same approaches apply whether breeding livestock or dogs. Livestock breeders practice selective breeding in order to improve milk production in dairy cattle, or egg production in poultry, as examples. In the world of dogs, selective breeding involves breeding for desirable conformation, working, temperament, and health characteristics. Selective breeding is often described as a delicate balance between art and science, and in recent years, the scientific component is playing an increasingly significant role.

DNA is the cornerstone of the scientific component, and while a PhD in genetics is not necessary to take advantage of recent scientific advances, a base understanding of DNA certainly becomes helpful. The lack of understanding surrounding DNA has also led to a phenomenon that some within the fancy have coined "sample fatigue." The term sample fatigue does not refer to any type of degradation in sample quality; rather, it refers to the seemingly constant request for DNA samples from breeders and the resulting resistance to respond believing we have already provided samples once before. A base understanding of DNA, the uses of DNA, and the various programs requesting

DNA is essential in order to alleviate sample fatigue.

DNA is the genetic material found in nearly all living organisms that specifies the characteristics an offspring inherits from its parents. The most common canine DNA application is the AKC's DNA Program. AKC DNA Profiling is based on a simple cheek swab collection. The contracted lab establishes the dog's profile, or genotype, based on the DNA found at 14 specific markers - unique locations along the genome. The information is used to verify parentage and for genetic identity purposes, increasing the accuracy and integrity of the AKC's registry. The program does not evaluate actual known genes, and as such does not provide information regarding genetic health, conformation traits, performance ability, coat color, etc. It is used for parentage verification and identity purposes only, and does so with greater than 99% confidence.

The second most common application for DNA involves collection of samples and DNA Testing of genes for specific traits. The recent completion of the mapping of the canine genome has led to exponential growth in research at the molecular level and the availability of resulting tests. These include tests for both physical traits such as coat color and length, as well as tests for diseases

such as Progressive Retinal Atrophy (PRA) and von Willebrands disease (vWD). Most of the available tests are breed specific.

Finally, the least understood application involves DNA collection for research purposes. DNA samples are used by the research community when mapping and identifying the genes that determine inherited traits. Researchers use the sampled DNA, along with corresponding genealogy, phenotype, and known modes of inheritance to identify which genes influence inherited traits, as well as what gene mutations may cause undesirable traits such as disease. Breeders are frequently called upon to supply critical DNA to these various research efforts. Unfortunately many are succumbing to the concept of sample fatigue believing that if they have already contributed DNA, whether through the AKC's Profiling Program, or to another research effort, further samples are not needed. Breeders need to understand that DNA provided to the AKC is not made available to researchers, nor does the resulting profile number provide any intrinsic information that is of value to a researcher. In order to avoid sample fatigue, for research purposes breeders are best off providing DNA samples to centrally managed DNA Banks such as the OFA/AKCCHF sponsored CHIC

*(Continued on page 44)*

*DZUIK, cont'd.*

DNA Repository so that a single sample can be made available to the research community at large without continuous sample donations to individual research projects.

More information on the CHIC DNA Repository can be found on the CHIC website at [www.caninehealthinfo.org](http://www.caninehealthinfo.org). The CHIC DNA Repository works with the genetics labs at the University of California Davis and the University of Missouri to receive samples and store extracted DNA. Both swab and blood based samples are accepted. To date, more than 25 Parent Clubs have sponsored DNA collection clinics at

their national specialty events. The convenience of these clinics are largely responsible for the rapid success of the CHIC DNA Repository which now includes over 7,000 samples representing over 100 breeds. In addition to CHIC, several Parent Clubs such as the Rhodesian Ridgeback Club of the United States have developed programs in-house to promote DNA sample collection and storage.

Parent Clubs can even combine collection clinics for CHIC with the AKC's discounted DNA Profile Program. Multiple samples can be collected at the same time and satisfy both the AKC's profil-

ing requirements as well as the research community's need for samples. Information on this program can be found at: [http://www.akc.org/dna/discounted\\_certification.cfm](http://www.akc.org/dna/discounted_certification.cfm).

A better understanding of DNA, its uses, and knowing what questions to ask when asked to contribute samples, will help us all avoid the dreaded Sample Fatigue. 🐾

*The AKC Canine Health Committee has approved this article and encourages its reproduction.*