

# AKC DNA Program Policies and Updates



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For over 20 years, The AKC DNA Program has used genotyping technology to ensure the integrity of the registry and to assist breeders with the accuracy of their breeding records. With multiple policies in place, this article serves as a quick reference for breeders. This article aims to summarize the services provided by the AKC DNA Program to help breeders in their mission to breed better dogs.

## HISTORY AND TECHNOLOGY

The AKC DNA Program uses a panel of 201 markers for genetic identification and parentage verification purposes. Each marker is a single nucleotide polymorphism (SNP), and all 201 are run on what is called a SNP chip. Implemented in December 2022, this upgrade harnesses newer technology to provide a more robust and flexible panel to serve the growing needs of the registry. Historically, the AKC DNA Profile platform was a 14 marker panel utilizing single tandem repeat (STR) technology.

Both the 201 marker panel and the 14 marker panel satisfy criteria for registration purposes. In most cases, if a dog has a 14 marker profile, an update to the 201 marker technology is not necessary. The only situation where an update may be necessary is for parentage evaluation. Because these profiles come from different technologies, STR DNA Profiles are not compatible for parentage evaluation with the SNP DNA Profiles.

## **Planning a Litter with Frozen Semen?**

- If you plan on using one sire and the sire already has an AKC DNA Profile on file, then no action is required. Both 14 marker and 201 marker profiles satisfy the Frozen Semen DNA requirement.
- If you plan on a multiple-sire litter:
  - Ideally, the 201 marker profile is available on all sires, dam, and puppies.

- If a sire has a 14 marker profile and is still alive, then a new DNA sample can be obtained with cheek swabs. This option is the fastest and easiest.
- If a sire has a 14 marker profile and is deceased, then AKC DNA may be able to pull the previous DNA sample and run the 201 marker profile. A straw of frozen semen can also be used to run the 201 markers.
- If a sire has a 14 marker profile, is deceased, and no DNA is on file, then AKC DNA can request 14 marker profiles on the other parents and puppies.

If you have a multiple-sire litter planned or if you expect you will require a parentage evaluation AND one of the parents has a 14 marker profile, please contact AKC DNA at 919-816-3508 for guidance. Typically, the parent with the 14 marker profile will need an update to the 201 marker profile. If DNA is not currently available for that parent, then the 14 marker STR profile can be run on the puppies and other parents for comparison. The AKC can run compatible profiles when needed. The [AKC Parentage Evaluation Service](#) provides parentage assessments for \$50, which will include ensuring that all sires, dams, and offspring have compatible panels.

### CURRENT AKC DNA PROGRAMS AND PRODUCTS

The AKC has a comprehensive set of programs used to provide dog owners and breeders assurance regarding genetic identification and parentage verification, including:

- Voluntary DNA Profile Program
- Frequently Used Sires Requirement (FUS)
- Fresh-Extended/Frozen Semen Requirement
- Multiple-Sired Litter Registration Policy
- AKC Parentage Evaluation Program
- Imported Breeding Stock Requirement
- Conditional Registration
- Kennel Inspections/Compliance Audit Program (CAP)

**Voluntary DNA Profile Program:** An AKC DNA Profile containing the dog's registration information, genotype, and a unique DNA Profile number is issued for each dog sampled. This DNA Profile number will appear on subsequently issued AKC Registration Certificates and Pedigrees. Many breeders opt to voluntarily submit for DNA profiling in advance or anticipation of AKC mandatory requirements such as FUS.

**Kennel Inspections/Compliance Audit Program (CAP):** DNA samples are sometimes collected by AKC Field Inspectors who perform approximately 3,000 kennel inspections each year.

**Frequently Used Sires Requirement (FUS):** This AKC Board Policy requires the mandatory genotyping of all sires prior to the registration of a 4<sup>th</sup> litter in any calendar year or a 7<sup>th</sup> litter in a sire's lifetime. All breeders, but especially those who purchase breeding stock or stud duty from other breeders, are encouraged to use AKC's voluntary DNA program to verify parentage of purchased breeding stock well before FUS Requirements to avoid future problems.

**Fresh-Extended/Frozen Semen Requirement:** Since October 1998, the AKC has required the mandatory genotyping of all stud dogs whose semen is collected for frozen or fresh extended use. DNA profiling is not required for artificial inseminations wherein both dog and bitch are present.

**Multiple-Sired Litter Registration Policy:** Since September 1998, AKC has required the mandatory genotyping of all potential sires as well as the dam and all puppies of any multi-sired litter. As of October 2022, no penalty fee is required for multi-sired litters.

**AKC Parentage Evaluation Program:** The AKC will evaluate the parentage of a litter and provide a Parentage Evaluation Table and written report based upon genotypes on file with the AKC. Breeders need to submit DNA samples for any canines not already present in AKC's DNA database at the time of the request for **AKC Parentage Evaluation**. The canines sampled do not need to be AKC registered to participate in the evaluation.

**Imported Breeding Stock Requirement:** Imported dogs registered on or after March 1, 2006, must have an AKC DNA profile prior to registering an AKC litter whelped in the United States. This requirement applies to both males and females.

### **AKC Conditional Registration**

If dogs with unresolved parentage exclusions are believed to be purebred, then excluded dogs and their progeny are issued AKC Conditional Registration Certificates and Pedigrees instead of being cancelled. "Unknown" will be noted on the registration or pedigree for the ancestor in question and any male/female bred to a dog with **AKC Conditional Registration** is required to have DNA on file with AKC in order to register a litter. The downgrade to conditional status will remain in effect for the excluded dog(s) and all progeny until a three-generation pedigree of AKC DNA verified parentage is established. The documents issued to conditionalized dogs are clearly labeled as Conditional. AKC Conditional Registration allows breeders to work through parentage issues without totally removing purebred dogs from the gene pool. By fully documenting and disclosing the incident of unknown parentage, breeders and dog owners can make their own informed decisions about whether they will buy or breed a certain dog.

## FUTURE – HEALTH TESTING AND RESEARCH INITIATIVES

### **AKC DNA + Health**

In the next few months, AKC DNA is launching AKC DNA + Health, which includes over 328 tests for health markers, as well as traits such as color, coat, etc. This test utilizes SNP chip technology to enable reliable, cost-effective results with an efficient turnaround time. Most importantly, results will be filtered by parent club recommended health statements, so breeders remain in control of highlighting the most important tests for their breed. Results for other tests will still be provided, as these tests may be relevant in certain lines or individuals.

To complement the health testing, the AKC Canine Genetic Counseling Center has also been created to provide practical information and advice on the interpretation of these tests. Staffed by veterinary professionals, this service aims to provide information so that breeders can make the best decisions. In other words, we will not tell you what to breed; only breeders can make that decision. For questions about the upcoming health test, please email [dnahealth@akc.org](mailto:dnahealth@akc.org).

### **Genetic Diversity Project**

Additionally, genetic tests rely on robust breed-specific data. Caution should be made when extrapolating test results into a separate breed or even a subgroup of the breed. Public genomic sequences of dogs are expanding rapidly, but not all breeds are represented equally. For more common breeds, these sequences may not reflect the full spectrum of genetic diversity within the breed. To address these problems, the AKC is planning to sequence thousands of dogs to develop a gold standard database of genomic information for each breed and to help further canine health research. Using the registry to produce elaborate breed pedigrees, the AKC is in a unique position to ensure that the genetic diversity within the registry is represented. Ultimately, this information will be in the hands of breeders to help them achieve their goal of producing better, healthier dogs. For more information or to participate, you can request a research kit at <https://www.akc.org/breeder-programs/dna/dna-resource-center/genetic-diversity-project/>.

## SUMMARY

The AKC DNA Program is one of the oldest continuously operating canine DNA operations in the world. With nearly one million canines profiled, more than 500,000 canine DNA samples in storage, and more than 250,000 participating breeders, the AKC remains a leader and innovator in this important field. Now in its third decade, the

program is well positioned to take advantage of new and emerging technologies to assist breeders and dog owners alike.