ASCA DNA PARENTAGE VERIFICATION EXPLAINED

HISTORY OF THE DNA PARENTAGE PROGRAM:

The Australian Shepherd Club of America started its pilot DNA program in 1994 after a presentation to the Board of Directors given by Dr. Jerry Caldwell of ImmGen, Inc. The purpose of the program was to develop a DNA genetic database to create and maintain an accurate registry. The program began with processing of 130 samples from members who volunteered their dogs’ blood.

In 1996, the Board of Directors announced there would be a 3-year phase-in of mandatory DNA profiling for parentage verification of all breeding stock. However, there were a lot of misconceptions among the membership about what DNA profiling would accomplish and what kind of information could be obtained from such profiling. The phase-in of mandatory DNA profiling of all breeding stock was later rescinded in an official announcement in the November/December 1996 Aussie Times, however, the voluntary program would continue for those members who wanted their dogs profile added to ASCAs growing DNA database. In the same issue of the Times an announcement regarding the establishment of the DNA Committee was made. The mandate of the committee was to formulate policy regarding the voluntary DNA program for parentage verification of all breeding stock and to educate the membership on the benefits of DNA by writing articles for the Aussie Times.

By the summer of 1997, the members of the Committee had been chosen and work had already begun. In the Committee report in the June/July 1997 Aussie Times, the Committee stated it had prioritized several issues of immediate concern regarding the DNA Program. Later that year, the Aussie Times featured advertisements promoting the DNA Parentage Verification Program.

In 1998, after approval by the ASCA Board of Directors, Certagen became the first approved DNA lab in Europe. With the help of a breeder in Germany and after some initial bumps in the road, the lab was able to certify parentage for the first Aussies in Europe. Since then Certagen is the only ASCA certified lab in Europe and outside the United States.

The mission of the DNA committee was and continues to be the development of policies and procedures for the implementation our DNA Parentage Verification Program and with educating the membership on the benefits of DNA profiling for parentage verification.

WHY DNA PARENTAGE CERTIFICATION IS IMPORTANT:

When breeders consider dogs for breeding they research the pedigrees of the potential parents. Some of the things that are looked for in the pedigree are specific traits, structure, working styles, temperament and health issues. Breeders are trying hard to screen pedigrees for health issues before making breeding decisions.

In the long run, DNA-VP can become very important to the health of bloodlines of dogs from breeders who use health information before breeding a litter.

HOW DNA PARENTAGE TESTING WORKS:

The ASCA parentage verification test is an exclusionary test (the word match does not apply). If a given offspring exhibits two or more genetic markers that do not appear in the DNA profile of either the alleged sire or dam (numbers are exact) then one or both of the alleged parents are “excluded” as being the true parents(s). Note: one marker difference in the offspring is not considered an exclusion as it could be a mutation. The alleged parents are said “to qualify” as the true sire and dam if less than two exclusionary markers are exhibited in the offspring.

A standard DNA test is used by Therion and ASCA to DNA identify (register) individual dogs and verify parentage. A set of 11 genetic sites (loci) are screened on the DNA chromosomes of each dog resulting in a DNA profile. Since chromosomes are found in pairs...
this test results in a DNA profile for each dog of a set of 22 “alleles” or genetic markers. These 11 loci were chosen because they show variable alleles possible at each locus, i.e. chosen because they show genetic variability among most dogs. Please note that if a cheek swab or FTA blood card sample is not collected correctly or handled properly or if not enough cells are deposited this will result in fewer genetic markers being assayed. This is why Therion recommends using whole blood to DNA your dogs.

Each dog/puppy receives half of its genetic markers (11 markers) from its dam and half of its genetic markers (11) from its sire. Therefore if all of the genetic markers appearing (as numbers) in the DNA profile of a given puppy also appear in the DNA profile of either the alleged sire or alleged dam then the puppy is determined to qualify as the offspring of the indicated sire and dam. However if the DNA profile of the puppy contains genetic markers that do not appear in the DNA profiles of either the sire or the dam then the puppy cannot be a product of the mating of those two dogs and either the sire and/or the dam is excluded (based on the non-matching numbers).

PROCEDURE WHEN THERE IS A DISCREPANCY IN THE PARENTAGE:

ASCA informs the Owner and Breeder of the dog that has had the exclusion. We try to identify other possible sires that are on the premises and find out if they are DNA profiled. We then have a new sample submitted if necessary for comparison to the new dogs. The ASCA Office Manager is the main point of contact between ASCA and Therion. The DNA committee is informed if there are cases that cannot be resolved.

HOW TO AVOID COMMON PROBLEMS THAT CAUSE REJECTION ON SAMPLES SUBMITTED:

Rejection of samples is usually a matter of the quality of the sample. Such as not enough blood/cells collected, too much blood on FTA card so some contamination exists, etc. If a sample doesn’t work well the first time we will rerun it either (1) using more of the sample and/or (2) run the sample by itself or run the missing markers individually to maximize the chance of success.

BLOOD TUBE-Whole blood is the most reliable method of submitting a DNA sample. It is important to ensure proper blood collection technique is used to prevent sample errors.

BLOOD CARD- Too much blood or not enough blood will cause rejection. In addition, if the card is not allowed to thoroughly dry, mold can become a problem. Please let the card air dry completely. In humid areas, it is suggested to let the card dry longer than the recommended time.

CHEEK SWAB-Read the directions included with the swabs, BEFORE you start collection. Not enough cells collected or contamination (including mold) of the swab is the usual reason for rejection.

After removing the swab from its package, make sure you do not touch the tip or allow it to come in contact with anything that could cause the DNA to be compromised. To collect your dog’s DNA, lift your dog’s upper lip and insert the swab between the cheek and gum line. Using gentle outward pressure, swab the inside of the cheek in a back and forth motion, turning the swab occasionally to coat the entire tip with cells. Keep the swab in the mouth of the dog for a slow count of 60. The longer you are able to keep the swab in the dog’s mouth the better chance you have of collecting more cells. DO NOT soak the swab in the dog’s saliva as that washes the DNA away. After you have completed the collection of cells, make sure you do not let the tip touch anything, such as counter/table tops, your skin or anything that could contaminate the sample.

MULTIPLE SIRED LITTERS-WHY MANDATORY EXTENDED MARKER SET IS REQUIRED WHEN SIRES ARE CLOSELY RELATED:

If there are multiple sires to a litter (either by choice or chance) that are closely related (father, sons, siblings or uncle) the ASCA registry rules require the use of the extended marker set (12 markers). This is in addition to the standard set of 11 so a total of 23 markers are used for closely related breedings. This is because of the high probability of corresponding genetic markers between the possible sires. The standard marker set would not be able to exclude sires so the extended marker set would be needed.

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