Poodle MHC Study Status – April 2011

The Poodle MHC Study: Dr. Bannasch's statement (2/2010) during the discussions on the Toller that Standard Poodles had 3 DLA haplotypes caused the Poodle Club of Canada's Health Officer to contact Dr. Lorna Kennedy at Manchester (UK) who had done the initial investigation. In her initial samples from the UK, 6 haplotypes were found with 2 each in one dog only. The fact that the PCC had an online health survey <www.pcchealth.ca/main.html> available encouraged Dr. Kennedy to initiate a 5- year study into the number and extent of DLA haplotype variations in Poodles worldwide, sponsored by the PCC, using grant money from Royal Canin. Each DNA sample is directly connected to a dog's record in the PCC Health Survey, so that data for further research into the Poodle will be available to scientists after the study is completed. Using population genetics calculations from the Poodle Health Registry's online pedigree/health database, the Health Officer collected 31 samples from worldwide representative Standard Poodles, including rare outlier pedigrees, which had been imported by a group of breeders concerned by Dr. Armstrong's findings of a genetic bottleneck and subsequent inbreeding depression. A preliminary report was received from Dr. Kennedy in March 2011.

- 10 haplotypes were found, making a total of 11 haplotypes now identified in the Standard Poodle. (7 of the 10 found came from 1 kennel)
- Only 8 dogs in the first batch of 31 did not carry haploype # 1 (the most common haplotype)
- 15 samples were homozygous, (13 homozygous for haplotype # 1).
- Above COI (10 gen) of 7.9%, 12 out of 17 are homozygous.
- Above an estimated % Wycliffe of 40% (genetic bottleneck measurement), 9/10 were homozygous for haplotype # 1.

These results are slightly higher than were found in the original UK samples, which were collected starting in 1988.

A further 50 samples taken from the UK DNA bank will have been processed by the June Board meeting. A second batch from PCC using a directed search towards those bloodlines showing rare haplotypes and looking at Standard to moyen, klein or miniature crosses should have results by September.

Preliminary conclusions:

When Dr. Armstrong proved the presence of inbreeding depression in Standard Poodle, concerned breeders worldwide contributed pedigrees to expand his database. His advice at the time was to lower COI to below 10%, avoid popular sires, and track disease rates, especially cancer. His advice was echoed by the late Dr. Padgett and Dr. Jerrold Bell at breed seminars. Although voluntary except in the initial fight against SA, disease

registries were set up in several countries, especially on SA and Addison's and the data applied to a master pedigree database. However, rough statistical calculations using the breed average COI, the breed average % Wycliffe of 40 and the incidence of Addison's tracked by birth date show that while COI has stopped rising and even fallen slightly, the rise in dogs having 40% Wycliffe or greater (which *may* be homozygosity for haplotype # 1) and the rise in incidence of Addison's develop in parallel, with some lag in the disease graph line. While the % Wycliffe stabilizes by 1990, disease rates of Addison's continue to rise.

It seems evident, at least from these preliminary study results, that once the genetic bottleneck in Standards reached a certain level, no effort on the part of breeders was sufficient to stop the progress of homozygosity in the breed, and Dr. Kennedy has recommended crossing to other sizes of Poodles. It may be that as a result of experience with genetic bottlenecks after World War II, some European bloodlines are less homozygous, but that does not seem particularly evident in the pedigree database.