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## SUSTAINABLE BREEDING OF HEALTHY DOGS

The main mission of the Expertise Centre Genetics of Companion animals is to support sustainable breeding of healthy companion animals. The last couple of years there is a lot of public debate regarding heritable diseases and health and welfare issues related to breed standards and extreme phenotypes. The health issues related to extreme phenotypes should be managed by changing breed standards and by enforcement of unambiguous directions in the law. The problem of hereditary diseases is more complex, as several hereditary diseases manifest at a later age, after the animal is used for breeding. To support breeders in decision making and to ensure a healthy population on a longer term, we must make use of and combine the useful data-sources that are at our disposal. It starts with a good registration of pedigree structure and results of clinical screening tests. With complete datasets, estimated breeding values for individual dogs can be calculated, based not only on characteristics of the animal itself, but also on family-members of this animal. Calculations of inbreeding coefficients based on pedigree data can be a useful tool, however care must be taken that enough generations are taken into consideration, to avoid under-estimation of the inbreeding coefficient. With the availability of DNA-tests for monogenetic diseases, a powerful tool is available for gradual eradication of hereditary diseases from the population. Care must be taken to use the tests in a responsible fashion and not to exclude a large part of the breeding population. The availability of genome wide single-nucleotide-polymorphism (SNP) panels for dogs, offers many new possibilities. Inbreeding coefficients can now be calculated in an individual animal, rather than estimated based on pedigree. Further, it becomes possible to calculate the best match in the population to ensure genetic heterogeneity in the next generation. In this lecture you will learn about all possibilities for sustainable breeding and integration of these different data sources into a breeding advice that takes into account the health of the whole population on the long term.