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Summary of "Crossbreeding Is Inevitable to Conserve the Highly Inbred Population of Puffin Hunter: The Norwegian Lundehund"

The Norwegian Lundehund, the national dog breed native to Norway, is a highly endangered dog. Lundehunds were much appreciated and used highly in the 16th century in the case of hunting for both food and income to many families. As technology advanced and with the invention of the net around the time of the mid-1800s, the need for Lundehunds dropped drastically and led the breed into the demise of endangerment. With also the outbreak of the Second World War, also affected the population of Lundehund, and consequently affected the genetic diversity of Lundehund due to inbreeding. Inbreeding caused psychological and physical complications among the Lundehunds, resulting in smaller litter sizes and reduced population and reproduction. Since then, there has been development and support from both the Norwegian Lundehund club and the Norwegian Kennel Club to allow the method of crossbreeding with three other phenotypical similar breeds with the Lundehund. This is where the beginning of the optimal contribution selection (OCS), the method used to allow a maximum of genetic merit of multiple animals, with regulations of relationships between them, and crossbreeding are used to help the population and genetic diversity among Norwegian Lundehunds.

The data gathered is a pedigree of records gathered by the Norwegian Lundehund Club that included: identification of the individual, identification number of sire and dam, country of origin, country of residence, sex, birth date, information whether the dog is alive or dead, and several offspring. Statistical analysis was performed using both software packages ENDOG and EVA to assess the effects of importation on the Norwegian Lundehund population over three data sets: global, Nordic, and Norway. Also, an additional analysis was used that excluded the cross-bred individuals since the Norwegian Lundehund club prohibited it the time. These were limited to males and were only allowed to be used in 1,5, or 10 mattings; creating a total of 20 mattings being optimized in OCS analysis.

There were many discussions had over the data and analysis that was collected that included: pedigree completeness, the genetic contribution of founders and ancestors, relatedness and levels and trends of inbreeding, the effective population size, the probability of gene origin, and the optimal contribution selection. These discussions came to conclusions, for example, that the Norwegian Lundehund breed showed signs of inbreeding depression that was caused by high relatedness in the whole population. The overall conclusion is that the breeding optimization (OCS), resulted in no productive treatment that didn't include the introduction of foreign breeds with the Lundehund. The overall result of the experimentation is that crossbreeding should be accepted immediately to preserve the population of the Norwegian Lundehund dog breed.

Works Cited

Kettunen, A; Daverdin, M; Helford, T; Berg, P. Cross-Breeding Is Inevitable to Conserve theHighly Inbred Population of Puffin Hunter: The Norwegian Lundehund. Plos;https://doi.org/10.1371/journal.pone.0170039 (2017)