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BEYOND INBREEDING DEPRESSION? A CASE STUDY OF THE IRISH WOLFHOUND

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Inbreeding depression is a widespread and well-documented concern in dog breeding and has been described as a potential animal welfare problem. Consequently, there is currently a considerable movement towards the reduction of inbreeding levels, with the goal of reducing or eliminating inbreeding depression. However, the literature shows that there are mechanisms through which inbreeding depression can be overcome in a population despite continuously high inbreeding coefficients, most notably through purging of the genetic load in relation to genetic bottlenecks, combined with selection for fitness.

Using a pedigree database containing over 50,000 individual Irish wolfhounds dating back to 1862, it could be shown that the breed has gone through at least four genetic bottlenecks since that period, with the result that over 50% of genetic variability in the present population can be explained by just 3 individual ancestors and over 95% by 10 ancestors. However, the exponential increase in population size that took place since about 1965 tends to mask this intense inbreeding when inbreeding is calculated over just a few generations.

When combining the pedigree data with data on individual life span and litter size, no correlation between inbreeding coefficients over 5, 10, 20 and 30 generations as well as calculated back to the beginning of modern breeding and either life expectancy or litter size in Irish wolfhounds could be found. We therefore suggest that the breed may have been subject to purging phenomena during its past genetic bottlenecks.

Our results do not invalidate the well-documented advantages of reducing inbreeding in many breeds; however, they suggest that some breeds may have been subject to purging phenomena and that therefore, caution may be advised in extrapolating results on inbreeding depression between breeds. Research in other breeds with similarly high inbreeding levels (such as the Kromfohrländer) may be useful to further test this hypothesis.

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