

The Role of Health-Conscious Breeding and Genetic Testing in Reducing the Impact of Hereditary Disease

A Position Paper from the WSAVA Hereditary Disease Committee

Hereditary disease is an important welfare issue in companion animals. To reduce its impact, the Hereditary Disease Committee of the World Small Animal Veterinary Association (WSAVA) urges veterinarians and breeders to adopt 'health-conscious' breeding and to ensure the optimum use of pre-breeding physical examinations, genetic testing and counselling.

Health-conscious breeding

The WSAVA calls on veterinarians and breeders to ensure that criteria used for the selection of breeding animals include the ability to reproduce naturally and exclude anatomical characteristics that predispose to hereditary disease, such as extreme conformations including size, skin folds, angulation and extremely short faces (brachycephaly). If a breed demonstrates a disease-predisposing anatomy then selection should be towards a moderate and less extreme anatomy.

The WSAVA also calls on breeders to utilize pre-breeding health screening to select animals that are likely to produce healthy offspring. Pre-screening procedures include an examination of the medical history, veterinary physical examination, and breed-specific genetic testing. Breed-specific recommendations are available from many reputable sources including parent breed clubs, kennel and cattery clubs and animal health organizations.

The role of genetic testing

The WSAVA calls on veterinarians to educate themselves as to the availability and proper use of genetic tests on their patients. It also calls for individual genetic tests to be validated for the specific disease and the breed being tested. Mutations may segregate in multiple breeds but not necessarily be associated with disease in all of them. This means that a DNA test for one breed may not be appropriate for others. It also calls for genetic tests to be performed by a proficient and specialized laboratory that utilizes proper controls

and procedures. The use of multiplex genetic testing panels that report the results of more than 100 identified disease-associated mutations is replacing testing for individual gene tests as it is practical and more affordable to run all available tests on each DNA sample. The need to filter out results with no clinical implications for the individual's breed is essential with these types of test.

The importance of genetic counselling

The WSAVA calls for genetic counselling to be tailored to the individual animal and circumstance, including the mode of inheritance, the penetrance of the mutation being tested for, the breed being tested and the frequency of the mutation within that breed. The interpretation of each individual DNA test result and its associated genetic counselling recommendations must be appropriate for the test, the individual, and the breed to avoid improper decisions regarding breeding, treatment or euthanasia being made.

Further information

The WSAVA Hereditary Disease Committee sponsors the Canine and Feline Hereditary Disease (DNA) Testing Laboratories database (<http://research.vet.upenn.edu/WSAVA-LabSearch>) which is searchable by breed, disease, and testing laboratory. Each disease mutation has a link to the peer-reviewed published citation of its discovery. The Committee is working to develop educational resources and tools for veterinarians and breeders.

The Harmonization of Genetic Testing initiative of the International Partnership for Dogs is developing a website (<https://dogwellnet.com/ctp/>) to document individual laboratory quality assurance processes and procedures, and test applicability by dog breed.

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