

CHANGES AND CHALLENGES

THE ROLE OF DOG BREEDERS, SCIENTISTS AND VETERINARIANS IN THE FUTURE OF PUREBRED DOGS

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The first thing I would like to do today is share with you some information about the AKC Canine Health Foundation, its history, goals and plans. Following that, we will discuss some observations and thoughts about the future of pure-bred dogs and the changing role of dog breeders.

The American Kennel Club started the AKC Canine Health Foundation in 1995. While many people do not know this, AKC has been one of the longest and most significant supporters of canine health research for many years. They were the first and principle funder of the research that developed the vaccine for canine parvo-virus. However, in the early 90's they saw a need for a substantial increase and focus in the effort in canine health, particularly in area of genetics.

Thus the American Kennel Club established the AKC Canine Health Foundation as an independent national public foundation in 1995. The mission of the foundation is "to develop significant resources for basic and applied health programs - with an emphasis on canine genetics - to improve the quality of life for dogs and their owners.

Our motto or tag line if you will is -"working together for the health of your dog"
This motto was chosen because one of the most important goals of the foundation is to seek ways to integrate the knowledge of dog owners, breeders, veterinarians and other scientists for the purpose of advancing the health of dogs.

All of this is very well, but what do we actually do? Basically the Foundation raises money for canine health research - and we give it away. That sounds easy. Well, not the part about raising money! But where does the money go and how are priorities established?

The Foundation currently has 50 active and pending canine health research grants at 24 veterinary schools, universities and research institutions. In its first four years, since its founding in 1995, the AKC Canine Health Foundation has allocated over \$3.6 million dollars in support to canine health research studies.

Foundation funding is competitive. Grants are evaluated in an independent review process that was designed and is managed by Dr. C. Richard Dorn, Professor Emeritus of Veterinary Comparative Medicine, Ohio State University.

Three scientists working in the field addressed by the proposal review each proposal. Proposals are scored for scientific merit and evaluated for their potential to:

- 1) Advance the health of dogs
- 2) Produce materials and applications, which are reasonable and affordable for breeders and owners

additional criteria include:

- Does this research have the potential to produce a test or tool that will enable us to breed healthier dogs?
- Does this research address a significant canine health problem in dogs in general or in a breed?
- Does this research address a significant canine health problem that affects the comfort of the dog and it's relationship with it's owner?

How do we know what problems are important? Every year in May, we survey the all of the parent clubs for all of the 150 breeds of dogs. We ask these clubs to prioritize their most important health issues. We also use other standard surveys and information. Each parent club has been provided with a model health survey and disc. Many are currently conducting health surveys in conjunction with veterinary epidemiologists.

Now the question comes - how healthy are our dogs? – and what do we see in the future? One thing we know is that neither the Foundation, the veterinary profession or the Breed Clubs are likely to run out of work soon. Dr. Donald Patterson of the University of Pennsylvania, School of Veterinary Medicine has identified over 350 genetic diseases in dogs. It is likely that as we move forward additional diseases will be added - because over 3,000 genetic diseases have been identified in human beings - and most of us are not linebred.

Genetic disease is not unique to dogs, or humans, we now know that many of these diseases are inherent defects in the mammalian genome. Given a small population, chance, breeding bottlenecks and selection for specific traits, they will inevitably, sadly and randomly strike. What does this mean to the dog breeder? It means that while we are happily selecting for coat, color, behavior and temperament characteristics, we may also be selecting for undesired, and currently invisible traits that we do not know are there.

Some might say, “So what, don't select and then there will be no problems. First, this is not true - mixed breed dogs suffer from hip dysplasia, bloat, thyroid disease, autoimmune disease, epilepsy and many other diseases. Second, we have come to love, admire and depend on the breeds of dogs we have developed over the years.

Life for shepherds all over the world would be an impossible and lonely task without the many breeds of sheepdogs that have been developed to serve them. Police and service dogs continue to adapt to our call by detecting bombs and drugs all over the planet. Labradors and German Shepherds serve as the eyes of many that cannot see and they are now joined by a legion of therapy dogs that hear for and assist their owners in the tasks of daily living. Search and rescue dogs fly in teams across time zones - to find life in the wreckage of disasters, whether they are natural earthquakes or man-made explosions. Toy dogs serve as loving companions of the elderly - lightening their lives and extending their years.

Since before recorded time - dogs have served man selflessly and for centuries we in turn have provided them with little beyond the necessary comforts of food and shelter. Only in the last century - through modern veterinary medicine - and the health advances of vaccines, therapy, surgery and medicine have we started to provide for their health. Now, we have the opportunity to do something truly remarkable - through research we can and will be able to prevent genetic disease. Now through molecular genetics there is both promise and reality in gene therapy and genetic testing. Due to research – and the development of the canine genetic map led by Dr. Elaine Ostrander, of the Fred Hutchinson Cancer Institute, we have identified genes for two eye diseases, *prcd* and *csnb*, and markers for a rare form of canine cancer.

Three years ago before the formation of the AKC Canine Health Foundation the genetic map of the dog did not exist. Now, in only its third generation, with a little over 550 markers on the map it has already been used to successfully identify disease. This year the map of the canine genome with additional funding from the AKC Canine Health Foundation and Ralston Purina the map will enter its fourth generation. Sometime in year 2000 we hope to have 2,000 markers on the map. It will then become an even more effective tool for scientists and breeders. By giving breeders the tools they need to see beyond the physical characteristics of their dogs - they will be able to make informed breeding decisions. We hope that by using these tools in the future we will be able to avoid calamitous diseases, like progressive retinal atrophy, hip dysplasia and epilepsy.

Fortunately for dogs and people - the homology between human genome and the canine genome is approximately 85%. Of the three hundred genetic diseases in dogs - 153 - to date - have been found to have human counterparts. This means that the medical research street even in genetics will be a two way street. Dogs will benefit from the research that has already been accomplished in the human genome and humans will benefit from the unique characteristics of dogs that make them one of the promising and fascinating species for genetic research. They are the most variable mammalian species in the world.

It seems to have taken a while, from the wolf cave to modern molecular genetics - but here is the question, “How will molecular genetic research and testing affect the breeder and the veterinarian?”

There are several trends that will affect the future of purebred dogs:

First, as the general public becomes more aware of health issues they are asking more questions about the health of their pets, particularly their dogs.

Second, as consumerism continues to grow, questions are increasingly asked about the quality of the dogs that are purchased.

Third, veterinary and medical science is providing us with more tools and tests to answer these questions.

Fourth, breeders are joining together in their national parent breed clubs to identify and prioritize health issues, raise funds and participate with their dogs in canine health research. Currently, we are working with over 50 breed clubs to assist them in locating, funding and co-ordination research projects.

These trends are forcing a division in the world of dog breeding - much as “papers” and “no papers” did in years past. Serious breeders and their dogs are in one group and casual breeders and their dogs are in another. Serious breeders are those who know and study their breed. They keep up with the latest medical advances, purchase good foundation stock and apply appropriate health screening and genetic tests. Casual breeders simply breed two dogs together of the same breed and depend on the luck of the draw. Educated consumers are beginning to discern the difference and it is our job to help them continue to understand and make decisions based on these differences.

The “serious breeder” will pose several opportunities and challenges for the veterinary profession in the years ahead. Some of these are:

- Specialty practices – Serious breeders are demanding and will continue to demand special services to meet their needs. Serious breeders already are seeking practices that offer special reproductive services, including: fresh cooled semen, frozen artificial insemination and reproductive surgery. They will seek out veterinarians and practices that know and understand purebred dogs and the special needs of serious breeders.
- Genetic Testing - over the next decade we anticipate that more and more genetic tests will be offered and used. Veterinarians will need to know what tests to recommend for a wide number of breeds. They will also need to know how to interpret these tests.
- Genetic Counseling - Serious breeders will want testing close to home, and will need help interpreting these tests and applying them to their breeding program. Veterinarians with training in both population genetics, and molecular genetics will be asked to provide these genetic counseling services.

- Continuing Education - Like any science veterinary science has been replete with advances and changes over the years and any practitioner has to advance their knowledge constantly. The area of genetics, however, presents a unique challenge for both the veterinarian and the breeder - as it is unlikely that they have been exposed to this type of study before. Courses will need to be designed particularly for those who wish to learn about and apply the products of molecular genetics.

Remember the “casual breeder”. Veterinarians will soon have at their fingertips a computer program that will provide detailed information on over 300 genetic diseases in dogs. While we may know that a disease occurred in a given breed - in most cases we can only guess at its prevalence. The veterinarian may increasingly become a counselor to their clients seeking a dog or seeking to breed their dog.

With the exploding amount of specific genetic information available veterinarians will be able to provide more information to their clients than ever before. But -- how will this information be organized, marketed and provided to breeders and owners?

Most importantly, how can we continue to communicate to the public the importance of a thoughtful purchase of a dog as a lifetime companion?

This is a task that we all must share, dog organizations, veterinarians and breeders. Finally, how can we best develop, apply and utilize the promising and powerful genetic tools now being developed? The first sheep has been cloned. The Swedish dog registry just registered its first multiple sire litter.

These events challenge our priorities and values and change our world. In the application of new tools and new science we need to continue asking questions.

Not just if we can, but, if we should? How we should? And if we do - what are the consequences for the future? We see a bright and increasingly healthy future for dogs. With the vision and talent of breeders, and, scientists, veterinarians and geneticists working together - we will arrive at that future sooner than we ever thought possible in a ship-powered by science and guided by our love of dogs.