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Genetically Clean Lines

Dogs have between 25,000 and 35,000 pairs of genes. Among those genes, every dog some which, if matched up with certain other genes or particular segments of regulatory DNA, will result in disease or other traits a dog breeder doesn't want. Given With that, there is no such thing as a completely "clean" dog or line.

However, a line might be "clean" of a particular problem. For example, some lines of Aussie will sometimes produce Collie Eye Anomaly, others have not. Progressive Rod Cone Degeneration a form of Progressive Retinal Atrophy, is very rare in Aussies. Therefore many lines will be "clean" of PRCD.

Every line will have strengths and weaknesses. For example, if a line is known for steep shoulders, that is a genetic problem in that line. It's not a disease or gross defect, but it is faulty and it is inherited. The more inbred a line, the more likely that serious problems will come to light whenever the necessary set of genes ar brought together in one dog.

Since no line is 100% "clean" of everything, what's a breeder to do? With your particular breeding goals in mind (for type, structure, temperament, performance ability, etc.) look for mates whose family history is strong where your line is weak. This means considering more than an individual; you must also get to know as many close relatives as you can.

Knowing the status of eyes, hips, etc. on breed foundation animals might be helpful, since present-day dog (sometimes 10 or more generations later) sometimes go back to one or more founder many times. Unfortunately, most of those founder dogs lived and died before anybody was keeping detailed records on health problems or other faults.

Many breeders tend linebreed to achieve their goals, concentrating on the contributions of particular outstanding sires. The use of popular sires has contributed greatly to the increasing levels of inbreeding in purebred dogs. Popular sires are also key factors in increasing the frequency of whatever diseases or faults they may carry genes for.

When breeders emphasize trait selection rather than specific pedigrees they can better manage genetically complex traits like behavior, certain aspects of structure, and some diseases. Genetically complex traits are more difficult to maintain (or avoid) through breeding strategies based on pedigree alone.

A system of assortative mating, where important traits are emphasized can help a breeder maintain valued traits while minimizing the occurrence of those that are unwanted. Rather than studying pedigrees to see how often certain names appear, the breeder evaluates the qualities and faults of the various ancestors behind her bitch and potential studs to select the best match.

There will never be a dog that is free from all undesirable genes, but through assortative mating breeders can minimize the impact of those genes.