

Dr. Roughie's Questions and Answers

Culling Versus Natural Selection

Kasmin D. Bittle DVM

Basic biology teaches us the theory of natural selection. Also called “survival of the fittest”, this theory holds that animals and plants, when left to their own devices, will reproduce in such a way that the strongest and most adaptable organisms will survive and reproduce most effectively. Over time, divergence from the original organism occurs, as animals best adapted to their environment, and even their time on earth, evolve according to the natural selection of the fittest.

In general, the development of purebred dog breeds is the antithesis of natural selection. With artificial animal selection, man determines who survives to reproduce, who reproduces most effectively, and by what criteria these animals are chosen. Selection criteria may include appearance, suitability to perform a specific task (i.e. hunting, herding), and temperament or personality. Often, selection criteria are rather arbitrary. Would, for example, the white German Shepherd be a less effective herder or flock guardian than the darker colored dog of the same breed? If so, why would the Kuvasz, bred to perform a similar job, be specifically selected to be white in color? Would the red setter, born in a Gordon Setter litter of traditional color, be less suited for the job at hand of finding birds in cover? The dog's field performance will probably best be predicted by the capabilities of his parents, rather than by their color. Yet by our modern, artificial selection criteria, neither of the above dogs would be allowed to reproduce, as they diverge from the ideal as set forth by man. It is doubtful that many of our purebred dog breeds would be suited for life in the wild, unassisted and unsupported by man's interventions. Indeed, taking the extreme modern day Bulldog for an example, it is doubtful that many would survive beyond one generation without the assistance of man. It is interesting to note that in third world countries, where semi-feral dogs reproduce with little interference by man, most dogs seen at large approach what I call the feral type-- medium size, medium build, erect ears, short to medium

length coats and long noses with strong jaws. Many of these feral type dogs have evolved into purebred dog breeds with the assistance of man. Examples of purebred dogs of this type, but often without the natural vigor of their disparate ancestors, are the basenji, the Ibizan, the Pharaoh Hound, and the Shiba Inu. Here we have dogs closely resembling the feral type, but often lacking in vigor when compared to their cousins found on the street corners.

How does this relate to the breeding of purebred dogs? Well first of all, these feral dogs would often make very poor companions. Many have rather sharp and cautious temperaments, thus their survival. Many would not be “biddable”, a rather convenient trait in the companion at the foot of the bed, but certainly not an essential trait to the street survivor. Many would hunt very effectively on their own or in packs, but be quite useless in returning quarry to man. Thus, while they may be healthy genetically, they may also be unpleasant to live with in close quarters. While artificial selection may result in animals more suited to an intended purpose, rest assured that a genetic price will be paid for artificial selection criteria. With regard to the purebred animal, it is also likely that animals selected for physical performance, in addition or to the exclusion of appearance, will be more vigorous than those chosen for appearance alone.

How do we then incorporate these principals into our breeding practices? Selection for physical performance, from a soundness standpoint, will result in healthier, more vigorous, dogs. Therefore, the dogs we keep, or the dogs that we choose to place in breeding homes, should be physically vigorous. They should not be the smallest in the litter, unless they are also the most vigorous. They should not be the dogs that are cute when they trot, but rather the dogs that cover ground with ease. They should not be the dogs at the back of the pack, but rather the dogs at the front. If not hunted, then we must look carefully for physical prowess in other ways. Selection for physical soundness and endurance will eliminate weaker animals, sometimes with undiagnosed defects, at an early age. The pup with a serious congenital heart defect may look similar to the

pup with a congenital musculoskeletal defect. Both may be smaller and less competitive with the littermates. While it may be of genetic interest to know why an animal is lagging behind the others, it is most important that the lagger not be chosen to reproduce because he is cute.

Early physical prowess is not unfortunately a good predictor for all hereditary defects. It is only a useful tool for the detection of congenital abnormalities that result in a loss of physical prowess at an early age. Other hereditary defects may have their onset at a later age and be poorly predicted in the puppy period. Epilepsy and late onset blindness are examples of these. The epileptic puppy may appear normal until and even after the onset of seizures. The dog with adult onset cataracts may have normal eye clearances prior to their detection. When artificial selection criteria are used, screening procedures must be utilized to increase vigilance for late onset problems. There is also wisdom in considering longevity when researching pedigrees. At what age did the ancestors of your dog die? What did they die from? Longevity may be a general predictor of overall health status. It also follows that the wisest breeding may not be to the hot young show dog of the moment, but rather to the seasoned veteran that is now seven, and has predominantly healthy puppies that are three and four years old. It is indeed unfortunate that we have most of our information in regards to both early and late soundness at an age when dogs are beyond peak reproductive performance.

Culling is the elimination of unfit animals from the gene pool. Culling may be performed by spaying or neutering these animals, by a prohibition on breeding or in some cases by euthanasia. In whatever form it takes, culling is the necessary substitute for the guarantees provided by natural selection methods. With advances in veterinary medicine many puppies that would fail to survive in a natural, demanding environmental setting may instead, with the assistance of man, not only survive but reproduce. I believe that this may be particularly true in the United States, where few dogs of our breed are hunted and where most breeders consider them to be pets first, and hunters last. The breeder must

decide how heroic to be in saving each and every puppy. Profit should never override the responsibility of soundness. To maintain some degree of vigor breeders must carefully consider the long term consequences of their selection criteria.