



SCOTTISH TERRIER CLUB OF AMERICA

Choosing A Stud Dog

AKC Gazette Article written by Kathi Brown

Choosing the proper stud dog for a Scottish Terrier bitch is one of the most important decisions a breeder can make. First, we must critically, and as objectively as possible, assess the dam-to-be. A realistic analysis of her pedigree, conformation, temperament and health is essential in determining both if she should be bred at all and to whom. The presence of a uterus and an ability to whelp large litters should not be the only criteria. Not to breed is often the best choice.

New breeders often rely on a mentor in making a stud selection. Often, your bitch's breeder is one's first advisor. This is especially advantageous if he or she is a successful breeder of high quality dogs over a number of generations. The knowledgeable mentor can provide essential, honest information about your bitch's ancestry. Often this individual will also convey the principles of breeding, which eventually leads to the weaning of the novice by encouraging the ability to make an intelligent choice.

Choosing a stud must be both a visual and mental process. Some will breed to a particular animal on looks alone, while others extol the strict analysis of a pedigree. It is in the balance of factors, the weighing of information that most consistently yields the best decisions. Certainly, we must have a correct mental image of our breed and the ability to judge specimens from breeding in relation to that picture. In this sense, a breeder is a "visionary" with the desire to improve each subsequent generation. We must also strive to obtain the necessary scientific knowledge on which we base our decisions.

Some might be put off by the language of genetics: the terminology from Allele to Zygote often obliterates the underlying concepts which assist a guide us. If we accept the premise that, in breeding we are trying to increase the predictability of a particular litter, then it becomes obvious that we must rely on the science of genetics. We want to increase the likelihood of positive occurrences and reduce the chance of negative consequences in structure, health and temperament.

I suggest that instead of the basic skill of the three R's, we as breeders increase our knowledge base in the three P's. The first, a homophone "Pea" refers to the principles

of genetic inheritance presented by Mendel in the 1860's which were based upon his observations and breeding of peas and other plants. His experiments showed that inheritance is particular and traits re-segregate upon further breeding rather than the previously held thought that each parent contributes equally to the offspring and these traits are blended. . The terminology associated with how these paired traits (alleles) are manifested include the often and well-explained dominant, recessive, incomplete dominance and multi-factorial. It is necessary for all serious breeders to seek an understanding of these findings through study. Although many publications are extremely technical and difficult, there are available publications which can be read and understood. Discussions among and between breeders of various levels of experience are beneficial in clarifying concepts and the development of clear thinking. The second "P" refers to the Pedigree as a potential guide for breeders. Once we can learn to read past the red lines of those achieving championship status or the wins of individual great dogs, one can begin to assess the likelihood of receiving genetic material from a particular ancestor. I was amused at a breeder who kept citing the existence of one particular dog in the sixth generation of a pedigree as a strong reason for breeding to that stud. Given that all dogs transmit their genetic material on seventy-eight chromosomes which are in thirty-nine pairs, it is a simple matter of applying mathematics and "Probability" to the pedigree analysis to determine the average chromosomes a puppy might receive from an ancestor.

Generation	Number of Potential Ancestors	Average Chromosomes from Each Ancestor	Odds Against Receiving Even 1 Chromosome
First	2	39	-
Second	4	19 or 20	-
Third	8	9 or 10	-
Fourth	16	4 or 5	-
Fifth	32	2 or 3	-
Sixth	64	1 or 2	-
Seventh	128	50 Ancestors Unrepresented	4 to 3
Eighth	256	-	8 to 3

Ninth	512	-	5 to 1
Tenth	1024	-	10 to 1

The third “P” of probability is extremely important in assessing the breeding potential of a stud dog or brood bitch. Applying the logic of this branch of mathematics to the pedigree analysis with knowledge of genetic principles helps us make the best choices for our bitches as well as for the future of our breed. One commonly held belief seems to be regarding the genetic similarity of litter brothers and sisters. I am continuously amazed at the number of breeders who state something along the lines of, *“Why not breed to the litter brother of the Champion Greatscot So-and-So; they have the same parents and, therefore the same genes?”*

The sire will contribute one of each of his thirty-nine paired chromosomes to the formation of each sperm. He may send only one from each pair, one through thirty-nine, to fertilize an egg in which the dam sends one of each of her pair, one through thirty-nine. The likelihood of any two identical sperm being formed is therefore, mathematically two to the thirty-ninth power. A book on human genetics states that humans (who have only forty-six chromosomes in twenty-three pairs) have a chance of a specific chromosome combination occurring one in 16,777,216 times. With the assistance of a calculator, I find the chance of two identical sperm or egg cells being formed by a dog or bitch to be 549,755,813,888 to 1. In light of this calculation, it is clear that littermates carry different chromosomes, display different characteristics and transmit different genetic material to their subsequent offspring.

In order to make the best choices for the betterment of our breed, we all must continue, to increase our knowledge upon which these choices are based.