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## BREEDING TO THE GREAT DOGS

By Carmen L. Battaglia

“What we work for we value most”

### INTRODUCTION

Educators, sociologists and psychologists all agree that the past has taught us not to abandon the fundamental principles that have stood the test of time. This is because many of our traditions and beliefs are deeply rooted in our way of life. These fundamentals have guided breeders for many years and can be stated in the following way:

*We will save those that we cherish,*

*What we cherish will have the traits we have learned to love,*

*What we love will depend on what we understand,*

*In the end,*

*What we understand, will depend on how well we have learned from our past.*

Fundamentals serve as a reminder to all breeders. Without an understanding of the past, ignorance will continue and informed judgments will not be passed forward. In many ways, the past and future are close cousins, because our future depends largely on how well we understand and learn from the sharp turns in the road. The life of a breeder has often been described as an adventure, not a packaged tour and in a sport that values competition, breeders are constantly faced with uncertainties. In such an environment, one must learn to enjoy the adventure as well as learn from the mistakes. At the end of the day, what becomes important is not what we do, but what we do with what we are given. Those who are afraid of uncertainty will not be comfortable in this environment because there will always be disappointments.

## **BREEDERS AND STUD DOGS**

**Change and new ideas have always been part of the sport. They are seen as either opportunities or obstacles. Take for example the old timers... they could not have imagined that computers, DNA technology and the Internet would all become tools of the breeder. To put this into perspective, we only have to look at our recent past. Prior to the 1990's, only a few breeders had computers. Today the PC is routinely used to search databases, find articles and critiques about dogs, look for the results of breedings and browse the placements of companion or performance events. In order to more fully appreciate the implications of these changes, one must realize that the genome was not mapped until 1995. Now, because of these advancements and those of other technologies, breeders are able to better screen and select their breeding stock.**

**Even with the improvements mentioned above some problems continue to linger. They also continue to contribute to the confusion about stud dogs and which ones to use in a breeding. Not knowing what traits a stud dog is able to produce or whether a popular stud dog is the best one to use with a female has caused many breeders to continue to use trial and error breedings. Because of this inherent flaw in logistics, breeders are left puzzled about which breeding method to use and how to recognize the best stud dogs. Both require an understanding of what problems breeders are able to solve. The task of finding the right sire requires time and effort because it is a stud dog's strength that must be used to offset the weaknesses found in the females. No matter how good a dog might be, no two are the same, and not every stud dog will be best suited for every female. While the great ones all have value, they are all different in what they are able to produce. Knowing how to evaluate them is what separates the best breeders from the rest. When it comes to the selection of a breeding animal, even the great performers do not always prove to be the good producers. Careful examination of what they are able to produce, in many cases, shows that some do not produce anywhere near their own level of performance. This dilemma leaves many breeders in the position of not knowing how to sort through all the information known about them and their offspring.**

Generally speaking, as the number of breedings increase for each stud dog, so do their chances of producing the desired traits as well as the undesired traits. In order to understand the impact that a popular stud dog can have on his breed, it is well to appreciate the fact that, for a genetic disease or a recessive trait to exist, there must be three kinds of dogs. Those that are affected, the carriers, and the normals. Thus, when a sire is widely-used he has a better chance of coming in contact with carrier bitches than other stud dogs that are only bred a few times. Since the value of a stud dog is determined by the qualities seen in their offspring, choosing the one that best compliments the strengths of a female, while offsetting her weaknesses, is central to the selection process.

One of the inevitable dilemmas that a breeder must face is the fact that many of the problems a stud dog will produce will not be discovered until after he has reached his prime breeding age. This complicates making comparisons between sires and their breeding results. The general rule in evaluating stud dogs begins with an analysis of their pedigree and the qualities seen in their offspring. This means that breeders must see enough offspring to know which stud dog produces the traits needed for the female to be bred. If it were not for the technology of frozen semen, many of the better producers would be lost to the breeding world. This technology has allowed breeders to learn more about stud dogs and how to use their pedigrees long after they are dead.

## **GREAT DOGS AND IMPORTANT TRAITS**

In each breed the number of high quality sires available for breeders to use is not the same in all breeds. Many believe their occurrence is somewhat predictable and that they will occur about once in every 5,000 individuals born. Unfortunately their discovery will often go unnoticed because the person who owns them will not recognize them or they unknowingly will sell or neuter them thinking they are pets. Given these variables, the predictability of their occurrence becomes somewhat of a soft statistic. In order to better appreciate this dilemma, Table 1 displays some of the differences between a sampling of breeds based on their AKC dog registrations. The reader should notice the dramatic change that has taken place in just one decade because it may well portend a trend that suggests an uncertain future.

**TABLE 1. AKC DOGS REGISTERED**

<b>Dog Registrations by Breed</b>					
<b>Breed</b>	<b>1996</b>	<b>2007</b>	<b>Difference</b>	<b>% Change</b>	<b>Decline as % of Difference</b>
<b>TOTALS FOR ALL BREEDS (Not just those below)</b>	<b>1,333,599</b>	<b>812,452</b>	<b>(521,147)</b>	<b>-39%</b>	<b>100%</b>
Rottweiler	89,867	14,211	(75,656)	-84%	15%
German Shepherd Dog	79,076	43,376	(35,700)	-45%	7%
Labrador Retriever	14,9505	114,113	(35,392)	-24%	7%
Cocker Spaniel	45,305	12,483	(32,822)	-72%	6%
Dalmatian	32,972	1,014	(31,958)	-97%	6%
Poodle	56,803	26,369	(30,434)	-54%	6%
Golden Retriever	68,993	39,659	(29,334)	-43%	6%
Pomeranian	39,712	16,605	(23,107)	-58%	4%
Shetland Sheepdog	33,577	11,755	(21,822)	-65%	4%
<b>Total for Breeds Above</b>	<b>595,810</b>	<b>279,585</b>	<b>(316,225)</b>	<b>-53%</b>	<b>61%</b>

In most breeds the “great” stud dogs are often found among those that are also the “popular” stud dogs. One of the concerns often mentioned about these dogs is the frequency of their use and the problems associated with their over-use. This has led some breed clubs to discourage the use of linebreeding or inbreeding in an attempt to maintain gene pool diversity. While over-use is a legitimate concern, molecular genetic research shows that there is more diversity (heterozygosity) present in a breed than most breeders realize (Bell 2002). Discouraging the use of line and inbreeding as an approach to preserve gene pool diversity has not worked because it is not the type of matings used that cause a loss of genes from a gene pool; the loss of genes occurs as a result of selection and the non-use of offspring. Regardless of a sires popularity, when a large percentage of breeders all begin to use the same dog, the phenomena is called the “popular sire syndrome”. This means that the gene pool of a breed has begun to drift in that individual’s direction, which in turn causes a loss of genetic diversity because the frequency of his genes will increase, possibly fixing a problem through the “founder’s effect”.

Breeding to a popular sire is not the same as breeding to a dominant one. Experience shows that in every breed there are many top performing dogs that have not produced offspring anywhere close to their own level of performance. This only proves that there are many variables that can influence success. Popularity can be misleading because some sires will produce traits that are fashionable (popular) but they do not contribute to the functional objectives of their breed. For example, large heads, wedge shape heads, and popular coat colors are easy to notice but they do not improve or support a breed functions. Close attention should also be paid to the sires that produce the dreaded disorders. These are the problems that cripple, kill, cause blindness or result in early death. Unfortunately, many of these disorders have a late onset. One of the built-in protections against the likelihood that one stud dog will be over-used is the breeders themselves. Fortunately for each breed, most of the breeders are very individualistic in their attitudes and their ideas about the selection of stud dogs. In addition to choice, breeders vary in their preferences with regards to the use of line-breeding, out crossing and in-breeding. Because breeders think differently and own bitches whose pedigrees are not the same, they will not all choose to use the same stud dog. Even if every breeder were given all of the known information about all of the “great stud dogs” in their breed, they would still vary in their choice of stud dogs and in the methods they would use when breeding to them. These differences help to maintain a breed’s genetic diversity. What further influences decisions about the use of stud dogs are the goals of the breeder. What they choose to focus their attention on varies widely from breeding to breeding (Bell 2002).

Last, but not least, is a variable that has yet to be measured. It involves the effect that gossip and rumor has on the use and influence of a stud dog. The longer a dog stands at stud, the greater the opportunity for gossip and rumor to grow. Thus it can easily be demonstrated that the popular sires all have the potential to influence and contribute to future generations. They also have the opportunity to contribute a disproportionately higher number of defective genes into the gene pool of their breed. For example, take a great stud dog that is also a popular stud. In most breeds these dogs will have been bred more often than other lesser known stud dogs. Therefore, it is important to understand how and why they become popular and why breeders choose to use them.

First, breeders choose to use a particular stud dog because they have seen quality in it's winning offspring. Within such a large group of youngsters it is difficult to keep problems a secret and gossip usually spreads quickly. On the other hand, the less popular studs who are bred less often may well have produced the identical number of defective traits and health problems as the popular studs but the gossip and rumor about them is controlled because fewer breeders are involved and there are fewer offspring to be seen.

The key to using a popular or great stud dog is to determine what it is able to produce when bred to certain pedigrees. When evaluating pedigrees, two methods are useful. They are called "depth" and "breadth" of a pedigree (Battaglia 2005). Depth of pedigree refers to the direct ancestors (14) which occur in the first three generations. Thus a dog is said to have depth of pedigree for a specific trait when the ancestors in the first three generations either exhibit or have produced that specific trait. The second method is called breadth of pedigree. This term refers to the littermates of these direct ancestors. This is the second best method for evaluating pedigrees to determine what a dog is likely to produce. Breadth of pedigree is often used when the focus of attention is on health, temperament or some other special trait of interest. For example, if a sire or dam had several littermates that carried or produced a desired trait(s) one would say this dog has breadth of pedigree for a specific trait. Those that are known to have both depth and breadth of pedigree are considered the better stud dog candidates. The following guideline is useful when evaluating the pedigree of all dogs.

#### **FIGURE 1. DESIRABILITY CHECK LIST**

- Frequency of desired traits occurring among ancestors (3 generations)
- Frequency of desired traits occurring among their littermates
- Number of carriers or affected littermates and ancestors (3 generations)
- Number of offspring produced with the desirable and undesirable traits

## **BREEDING METHODS**

**Dr. Jerold Bell, a noted geneticist at Tufts Veterinary College, stated that breeders actually engage in a genetic "experiment" each time they plan a breeding. Thus the selection of breeding methods (in-bred, linebreed, outcross) should coincide with a breeder's goals. Over the years, these three methods have been used to accomplish different objectives. The term "out-cross" is used to mean the breeding will bring together two animals less related than the average for the breed. This means there are no common ancestors in the first four generations. Out-crossing has the tendency to mask the expression of recessive genes which allows them to propagate in the carrier state (Bell 2005). Some breeders have used the out-cross in an effort to dilute the detrimental effects of the recessive genes. This has not proven to work as a method of control because the recessive genes cannot be diluted; they are either present or not. In addition to the above, out-cross breedings tend to bring in new genes which have the tendency to produce variations in the traits. Litters produced from out-cross breedings tend to have pups whose traits vary widely, even between the littermates. For example, the size and shape of their bodies will range from large to small and everything in between. Eyes will be oval, round, small or large. Others will have tails, body proportions and other characteristics that vary from the breed standard. Out-cross breedings are often used when new genes and different traits are needed that are not present.**

**In- breeding and line-breeding have other uses. The founders of most breeds used both methods to establish purebred dogs, and both methods rely on the use of ancestors that are related to each other. In-breeding means breeding ancestors that are closer than cousins to cousins. Line-breeding means ancestors that are cousins to cousins. Both methods can be used to concentrate the genes needed to maintain and preserve needed traits and characteristics. The following guideline is useful when attempting to predict the traits that are likely to occur in a breeding:**

## **FIGURE 2. FACTORS USED IN PREDICTING TRAITS**

- **Has the sire or dam produced the trait?**
- **How many ancestors have produced the desired trait?**
- **Are there good-producing ancestors on both sides of the pedigree?**
- **Were the desired traits observed in the littermates of the sire or dam?**
- **What is the heritability of the trait (s) that is/are needed?**
- **Will in-breeding or line-breeding be used?**
- **Do the notes about the ancestors suggest any surprises?**

**Those who learn about the traits that a stud dog can produce have the best chance of realizing their goals. Those who breed to them without knowing what a stud dog is able to produce will continue to breed based on trial and error methods and their progress will be slow. Finally we must remember that if the ancestors in the pedigrees of the sire or dam have not produced the desired traits, there is little reason to believe breeding them will produce these traits. Breeding purebred dogs demands time and attention to detail and there is no short cut to understanding each dog's pedigree. Success will come to those who take the time to study and understand the strengths and weaknesses of each dog used in a breeding program.**

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## **ABOUT THE AUTHOR**

**Carmen L Battaglia holds a Ph.D. and Masters Degree from Florida State University. He is an AKC judge, researcher and writer and is a leader in promoting the better ways to breed purebred dogs. An author of many articles and several books, he has been a guest on TV and radio talk shows including several appearances on Animal Planet. His seminars on breeding dogs, selecting sires and choosing puppies have been well received by breed clubs all over the country. Those interested in learning more about these topics should visit the website <http://www.breedingbetterdogs.com>**