

## Performance-based Dog Breeding in a Bottle?

The ideas and observations presented here are based on population genetic concepts related to selective breeding as they apply to domestic animals including the **hunting Deutsch Kurzhaar** and other **versatile hunting breeds**. Some “**natural selection**” and “**artificial selection**” breeding concepts are presented here, as well as ideas about how the artificial selection process has shaped **versatile hunting dog breeds** over time. The lion’s share of information provided is based on established population biology concepts. However, some of the information provided about **breeding philosophies** is editorial in nature. Though based on established biological principles, all of the information to follow should be considered the opinion of the author and evaluated as such.

### **The concept that a gene pool is better when it is larger is erroneous:**

In nature and in the breeding of most domestic animals the entire point of selection is to decrease or cover by dominance those genetically expressed traits that are not seen as beneficial without affecting those traits that are beneficial. Do to the fact that many individual traits are linked together and impossible to separate, in most cases nature must be satisfied with a compromise. The benefit of natural selection is that it provides a mechanism for a given species to adapt and flourish in a specific environment. For example if a species of animal expressed a genetic mutation that deprive its offspring the ability to see, making it impossible to find food, by natural selection that genetic mutation would be quickly weeded out since the animal requires nourishment to survive.

In “**artificial selection**”, e.g. the **breeding of Versatile Hunting dogs**, it is also the purpose of selection to decrease or mask with dominance, phenotypes (observable characteristics) that are unwanted or seen as undesirable. Those characteristics include physical traits as well as behavioral ones and as with natural selection compromises must be made. For example, dogs with a severe overbite are not used for breeding by conscientious **Deutsch Kurzhaar breeders**. In theory, overtime the possibility of producing a dog with a “bad bite” is decreased or masked by breeding only dogs that present a “good bite”. On its face the concept of producing the right outcome seems very simple but it is really quite complex, since most genes are responsible for producing more than one characteristic. Thus along with a “good bite” may come a trait that is even less desirable than the bad bite was. In other words, both good and bad phenotypes can be expressed by different loci on the same gene.

With respect to the available genes within a given gene pool, the “Bigger is Better”, concept is primarily based on the theory that more to choose from is necessary to improve the product. That concept is clearly incorrect since the whole point of selection, natural or artificial, is to “**weed out**” the unwanted”, in order to decrease the possibility of reproducing undesirable traits. The fact of the matter is if the “**Bigger is Better**” gene pool was the real motif applied to the artificial selection, e.g. the breeding of **versatile hunting dogs**, we would most certainly still have **Kurzhaar’s** that presented the same phenotypical characteristics as the many breeds from which they originated because the connected traits expressed by those genes would still be in the soup. Since it required that genetic material be available from a large gene pool to begin selectively producing

**versatile** breeds such as the **Kurzhaar**, many incorrectly reason that it requires that same large gene pool to continue the DK's progression.

Due to concerns about gene pool size there is much discussion in breeding circles about the population phenomena that biologist term as a "**Bottle Neck**". A "Bottle Neck" can occur when the available gene pool becomes so limited that a given species is driven to become a population in which the available genetic material is a fraction of that of the original population. In nature the resulting species might not be able to adapt to a changing environment and may become extinct.

With respect to **selective breeding**, no negative connotations should be applied to the "Bottle Neck" phenomena since it is exactly what, by selective breeding, we are trying to mimic. We control the environment thus no adaptation is required unless we choose it so. For that reason, when thinking of selective breeding, one should consider starting at the wide end of a funnel and working towards the small hole at the end. For example a conscientious DK breeder would not consider reintroducing some type of **blood tracking hound** back into the contemporary mix in order to increase the availability of genes in the pool that express good scenting instinct. Why? – because along with the possible enhancement of scenting ability may come pondering agility, sagging skin and other unwanted phenotypes that have been weeded out by our predecessors for good reason.

Consider for a moment that all domestic dogs are descended from the wolf. From the wolf gene pool enough genetic diversity was available to create all of the domestic breeds we see today. Those traits (wolf characteristics) that were deemed most suitable were selected by early domestic dog breeders. Eventually, each strain branched off headed for the "small end of the funnel". Even today, they continue to move towards it.

With absolutely no knowledge of the existence of genes, European breeders desiring a **versatile** hunting companion moved their respective breeds forward by selecting the traits that they desired. Their breeding decisions were strictly based on phenotype because that's all that could be seen and evaluated. It should be noted that genes and their relationship to inheritance were not discovered by Thomas Hunt Morgan until 1911, long after the **Germans** and other Europeans had begun their quest for the perfect **versatile hunting breed**.

In today's breeding world much talk is made of genes and gene pools but the reality is that breeders have no other choice but to select from what they can see, as did their predecessors, and most have little scientific knowledge of what combination of genetic factors contribute to any given characteristic.

It is interesting to note that even though the early breeders had no knowledge of genetics, they were selecting not only for physical and instinctive assets but for behavioral assets. That's interesting because the idea that genetic inheritance is responsible for the behavioral components of a species, including man, was only formally presented in 1975 by E.O. Wilson. Even

In any case, I can only imagine what kind of hideous beasts would be produced if the average **dog breeder** had much control over the complex genetic workings of their choice of **breeds**. Frankly, with all of the different variables and complexities related to the make up of a particular chromosome, genome, its genes, their loci and alleles;

mutations, dominant genes, recessive genes, proteins they code, for and finally the traits they express, they're is no way humanly possible, short of divine intervention, that a breeder can have much knowledge about the potential product of a any given gene. Because of that it should always be assumed that when breeders discuss such things as genes and gene pools that they are really talking only about phenotype – that's all they can actually see!

The point of selective breeding is to push the breed towards the small end of the funnel (towards the perfection of desirable hunting phenotypes); it's not to increase the size of the funnel mouth (the gene pool). Thus defending the need for a large gene pool as a valuable tool for selective **breeding** is paradoxical at best.

The fact that selective breeding is nothing more than the artificial construction of a bottle neck does not mean that it's not good to have a large group of dogs to choose from when looking for desirable characteristics. But it is a given that the final outcome of selective breeding is a decreased quantity of available genetic expression to choose from. Obviously a smaller gene pool equals fewer types of expressed traits. For example, one would not expect to reproduce the orange pigment of an ancestral schweiss hound, an early contributor to today's **Deutsch Kurzhaar**, by selecting from the current gene pool. On what could one draw since the possibilities are long gone? Even if the genes that could express such a trait existed, buried in some obscure recessive cave of a dog's genome, a breeder can only choose from what can be seen. In artificial selective breeding you can only move down a path of constant elimination; though some short lived back peddling occasionally occurs.

Some have theorized that if all domestic dogs were allowed to go loose and breed at random, that the group would eventually take the form of their wolf ancestors. Of course that's a fallacy. From what fountain of genetic material could they possibly draw? Even to theorize that it could happen over several million years is erroneous since, not only would the identical mutations that expressed the traits driven by natural selection have to occur, they must also be shaped by the identical environmental pressures that molded those of the wolf. In other words the ingredients needed do not exist and in all statistical probability can not be recreated.

Take for example the wild horses that were originally released by the Spaniards into the North American west. "Only After the Pueblo Revolt of 1680 were large numbers of wild horses seen roaming the grasslands of the Plains." So for well over 300 years the wild horse has run free to breed randomly. Expectedly, they look virtually the same as they did three hundred years ago. Not withstanding a miracle they will never again look anything like the eohippus ancestor they originated from. (*See Figure 1*)

A large gene pool is only necessary when natural selection, not artificial selection, needs the larger size in order for a given species to have the number of genetic variations needed to allow for natural adaptation of that species to its changing environment. Artificial selection negates that need and it is a given that its affect is going to hinder any adaptive requirements that natural environmental conditions would impose. It is interesting to note that the natural selection process, though responsible for many characteristics in a given species, is only effective if the organism survives long enough

to reproduce. What happens after an organism reproduces matters not. That is not the case with artificial selection. Breeders want a lifetime of good attributes, benefits and behaviors from what they have selected for and produced.

Using artificial selection, it is the breeder who decides what the environment is and indeed what is needed to adapt to it, i.e. what is needed for the dog to be an excellent hunting companion.

Consider the following scenario: We release a small number of domestic dogs into a remote location. Because that small population of dogs possesses traits that were artificially selected based on a breeder's fabricated environment, overtime it is doubtful that the domestic dogs would survive to reproduce in the wild. Though some of their traits might be conducive to their survival, many of the instincts and physical attributes they need to survive will obviously not be immediately available. And they would need those unavailable traits immediately because unlike natural selection that occurs over millions of years based on environmental changes that also occur over long periods of time, the poorly equipped domestic dogs would need to rely on those missing mutations needed for adaptation within days of their release. That just can't happen!

It should be understood that only thru random mutations are new possibilities made available to any living organism. Even in the modern field of genetic engineering the genetic material is not created, it is only relocated. In other words what is gone is most certainly gone forever!

Frankly, those who fear the perceived consequences of an ever shrinking gene pool should be grateful. The hardest work has already been done! When pining for a larger gene pool one should consider the daunting task undertaken by those behind them. Truly having too much to choose from can be much more difficult than not having enough. It is much easier to put together a puzzle that consists of 100 pieces than one consisting of 100,000,000.

### **Artificial Selection Based on Performance Testing, (A Performance-based Breeding Program For the Versatile Hunting Deutsch Kurzhaar):**

Now that we've established that breeding of domestic animals is an artificial system and that our focus when doing so is to "weed out" the bad while conserving the good; with the understanding that we are purposely headed toward the small end of the funnel, we can examine some real world breeding issues related to the **versatile** hunting **Deutsch Kurzhaar** and other **Versatile Hunting breeds**.

Breeders should be aware that selective choices will become harder and harder to make due to an ever shrinking number of available, observable, traits that can be differentiated. That is a given in any legitimate performance based- breeding system. Thus it becomes paramount that the discriminating Hunter seeking out a quality **Kurzhaar** finds an equally discriminating **Deutsch Kurzhaar** breeder. That breeder should have a thorough understanding of the German testing and breeding philosophy in word and practice and should have an even greater understanding of the physical and behavioral traits that are required to produce an exceptional **versatile hunting dog**. The presence of those good qualities in breeding stock should be measured, well documented and made available to the prospective purchaser of any **Kurzhaar puppy**.

### **Real World Divergence:**

As previously discussed, change through natural selection occurs over an extremely long period of time; the material for that change can only be produced by genetic mutation. Conversely changes produced via the artificial selection conducted by breeders occur over a much shorter time period. Take for example the progressing divergence of the hunting **Deutsch Kurzhaar** and the North American **German Shorthaired Pointer** gene pools. This is a prime example of how two vastly different breeding strategies can quickly affect phenotype.

On one hand you have the **GSP** that has been bred in **North America** with little restriction and little attention to performance for at least 85 years. On the other hand you have the hunting **Deutsch Kurzhaar** bred in North America and world wide in accordance with the performance breed testing requirements of the **Deutsch Kurzhaar Verband e.V. (DKV)**.

The **DKV** performance testing regulations exist for the purpose of improving upon and regulating the genetically expressed attributes of the **versatile hunting DK for the common foot hunters' use**.

Unfortunately, American breed clubs have no system of performance-based testing meant to improve or even maintain breed integrity. That's not to say that there are not **hunting dog** clubs and organizations that have some degree of testing. But none have a comprehensive performance-based breeding program in place for the **versatile hunting** breeds. They consist of test clubs with no breed standards and breed clubs with not performance standards.

### **The Affect and the Time Line:**

Let us consider the relatively short amount of time it has taken to precipitate the genetically expressed phenotype of today's **Deutsch Kurzhaar**. We can legitimately use the starting point of 1870 since it is approximately the time when **Prince Albrecht zu Solms-Brauenfels** correctly informed his contemporaries that, "**The only way to develop the wished-for utility dog-of-all virtues was to take and use only the dogs best performed in those requirements**".

Thus 1870 will be used here for the starting point of performance-based breeding of the **versatile DK** even though the zu Solms concept was not fully put into formal practice for sometime after that. Based on that reasonable starting time, the hunting **Deutsch Kurzhaar** has been under the restriction of a performance-based breeding system for approximately 136 years or less. For approximately 136 years breeders that have adhered to performance-based breeding of the **DK** have produced one of the world's finest **versatile hunting** dogs. Any fair minded person will admit that to produce such a specimen from such diversity of type in such a short period of time is remarkable.

Though there is some proof that the **DK** appeared in North America prior to its entry through the acquisitions of Dr. Charles Thorton in the 1920's, they existed here in no important numbers until that time. So we can reasonably use 1920 as their approximate debut in North America.

So now we have two sets of dogs: one a true versatile hunting dog; performance tested and performance bred The performance bred (**Deutsch Kurzhaar**) and another set of untested dogs'; bred with virtually no restrictions and without the benefit of a legitimate breeding program meant to progressively "weed out" undesirable traits.

### **The Math:**

Mathematically speaking, by dividing the **GSP's** 85 years of predominantly unrestricted breeding in North America by the **Deutsch Kurzhaars** 136 years of performance based breeding we find that the **GSP** has only enjoyed 62% of the selection process that has benefited the **Deutsch Kurzhaar** - and that's based on a very generous time line.

With the exception of some justly concerned breeders seeking the infusion of DK blood from time to time, and for good reason; the gene pool of the **GSP** has been left to stagnate in a state of cosmetic selection for nearly 85 years with little, if any, improvement in versatile hunting aptitude.

Simultaneously, the **DK** has steadily progressed forward towards the "small end of the funnel". That fact in and of itself, makes the need for a closed **DK** registry a necessity in order to conserve the progress that has already been made by "keeping the weeds out of the garden".

### **The Closed Registry Controversy:**

Because of the above we now have two different sets of dogs' possessing two very different levels of versatile hunting ability. The question is do we abandon the progress made on the **DK** for the sake of the stagnating **GSP**?

No doubt **German Shorthaired Pointer** supporters do not wish to view their breed as having diminished hunting capacity since after all it is classified as a "hunting breed". To have such a thing occur would clearly define the **GSP** as something "less" than the performance bred **Deutsch Kurzhaar**. The **GSP** is not necessarily a lesser breed as dogs go, but is likely a less versatile breed. Unfortunately, in real world hunting circles, i.e. those who actually hunt with versatile hunting dogs, the lack of versatility within the **GSP** breed is already the focus of much discussion, if not a forgone conclusion.

Those who support a "Closed" **DKV** registry are primarily real world hunters who understand the value of a performance-based breeding program. They have little or no interest in the show ring or financial concerns that have been known to affect the breeding integrity of some. Their main focus is on the protection and furtherance of the versatile hunting **Deutsch Kurzhaar**. As hunters they utilize the skill set of the versatile hunting **Deutsch Kurzhaar** to perform **all** of the hunting tasks for which it was originally conceived. They are practical people and harbor no ill will towards the **GSP breed**. They profess that, due to a lack of a restricted performance-based breeding program, the **GSP** has become a distinctly different breed of dog and only wish to protect the genetic integrity of the versatile hunting **Deutsch Kurzhaar**.

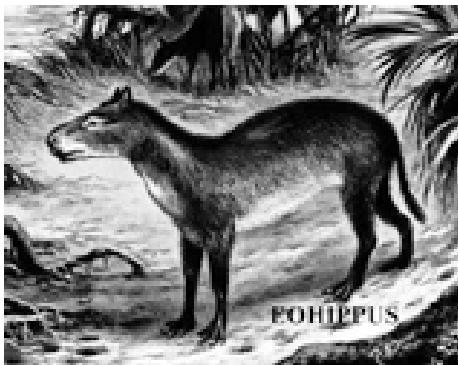
Though physically speaking the **DK** and the **GSP** are not different in appearance, it would be negligent for anyone to think 85 years of virtually random breeding, with little attention to versatile performance, has not taken its toll on the GSP's development.

### **Conclusions and Predictions:**

Breeding **versatile hunting dogs** is all about making the correct selections. Thus any legitimate breeding program should be based not only on conformation and temperament but on performance standards suited for versatile hunting dogs. Due to the efforts of real world hunters, it is likely that the **DK** breed will continue to move forward towards the small end of the funnel. Unfortunately, it is equally as likely that the **GSP** will be left in the wake to take whatever path that unmeasured breeding sends it down.

For more information regarding the versatile hunting Deutsch Kurzhaar go to [www.canamdk.org](http://www.canamdk.org) or e:mail Gary Fleming at: vectortfl@gmail.com

**Figure 1:**



### **Hyracotherium (eohippus)**

#### **Eocene Epoch - 55 Million Years Ago**

Hyracotherium, or eohippus (dawn horse) as the scientists named it, first appeared on earth as a small, timid creature no bigger than a dog. It existed from 55 to 45 million years ago. It was 10 to 17  $\frac{3}{4}$  inches tall at the shoulder and had four toes on its front legs and three toes on its hind legs. Hyracotherium lived in a damp, hot jungle of huge cypress and mammoth trees. Here it fed on leaves as it roamed over the boggy ground. Small size and multi-toed feet kept Eohippus from sinking into the swamp. The remains of this original little horse have been found in such places as the Wasatch Range in Utah, the Wind River Basin in Wyoming, and in Europe.