



# Arabian Breeding: More Than Just a Stallion and a Mare

Written By Jennifer Blosser



Fa Daalim

To discuss the practices of Arabian horse breeding, we must first understand common terms and their definitions. Too often these words are used without the full knowledge of what they actually mean. Terms such as Crossbreeding, Inbreeding, Linebreeding, and even Homozygous and Heterozygous are often used in the promotion of a horse, but do we really understand them? Here is a short explanation of some of the more common terms and a discussion on how they are used in Arabian Breeding.

First, we should start with a little about genes. All genes have two alleles that represent that gene. They can be *heterozygous*, which means they are different (Ee, one dominant and one recessive) or they can be *homozygous*, which means they are the same (EE or ee). Each circumstance has a different result. We can use the basic coat color of horses as an example. The base is either Black or Chestnut. Chestnut is represented as ee, or *homozygous recessive*. Black can be expressed as either EE (*homozygous dominant*) or Ee, heterozygous, which results in black but is carrying the chestnut color and can produce it. Understanding such factors can affect how we breed our horses and what methods we use in selecting specific matings.

*Crossbreeding* is the mating of animals of different breeds (or species). Crossbreeding usually results in *Heterosis* or *Hybrid Vigor*. Heterosis or HV is the amount by which measured traits of the crossbreds exceed the average of the two or more purebreds that are mated to produce crossbreds. Many use crossbreeding loosely to describe the combination of two different lines within the Arabian breed, which can also produce HV to an extent, but in fact the term that should be used here is *Outcrossing*. Outcrossing is the mating of individuals that are less closely related than the average of the breed. Breeders can periodically outcross by adding new sires or using shipped semen from an outside stallion.

As applied to the general equine population, *Inbreeding* is the production of offspring from parents more closely related than the average of the breed population. In smaller, tighter genetic pools, such as Straight Egyptian or Sheykh Obeyd Arabians, Inbreeding specifically refers to only 3 kinds of matings: daughter to father, son to mother, full sibling to full sibling. Inbreeding increases the proportion of homozygous gene pairs and decreases the proportion of heterozygous gene pairs. Inbreeding also increases the prepotency and facilitates expression of recessive genes. *Prepotency* is the ability of a parent to transmit it's characteristics on to it's offspring so that they resemble that parent, or each other, more than usual. Homozygous dominant individuals are prepotent. Inbred individuals tend to be more prepotent than outbred individuals.

Another practice often used in Arabian breeding is *Linebreeding*. Linebreeding is a form of inbreeding in which an attempt is made to concentrate the inheritance of some one ancestor, or line of ancestors, in a herd. While commonly used to describe the concentration of one or more ancestors within a pedigree, technically speaking, the distance between the relationships of individuals under this scenario does not

exceed that of second cousins or sharing mutual great grandparents. The average relationship of the individuals in the herd to this ancestor (outstanding individual or individuals) is increased by Linebreeding.

So what does all of this mean? Well to the casual breeder, not much, but it can be used as an incredibly valuable tool for the more astute student of the breed. Some believe that crossbreeding is very important and indeed it is. The Hybrid Vigor that a crossbreeding or even an Outcrossing program can achieve can have great results. Arabians were exported from Egypt and crossed with a lot of native stock from other countries to produce a more useful and productive animal for their purposes. If it weren't for crossbreeding Arabians, we would not have breeds such as Thoroughbreds, Lipizzaner, Morgans, Hanoverians, Trakehners, Akhal-Teke, Orlov Trotters, Standardbreds, The Criollo (Argentinean cow-pony), The New Forest pony, The Welsh Mountain pony, the Hackney, the list goes on and on. We owe our desert steeds a great debt for their genetic involvement in nearly every breed in the world. All of this is due to Crossbreeding.



Sean Daaim CH (Fa Daalim x Ms Tuht)

Outcrossing within the Arabian breed has also provided incredible results. The Sheykh Obeyd (SO) lines, used as an example only because of the author's first hand relationship with this breeding group, have been bred to only contain the

blood of 66 original horses from 7 foundation breeders in Egypt who meticulously authenticated each pedigree. They can be considered an outcross to most other subgroups of Arabians. They provide a great source of prepotent "old blood" to the newer pedigrees of the Polish, Anglo, Russian, Spanish, and even some Egyptian Arabians. This can be best understood by reading such articles as 'The Sheykh Obeyd Influence on the Show Ring', by Arlene Majid, or 'Blood Tells', by Amelie Blackwell. These articles offer substantial evidence that Outcrossing Sheykh Obeyd Arabians with the general gene pools of other lines of Arabians provides great Hybrid Vigor.

But if Outcrossing and Crossbreeding are such great methods of producing quality animals, why would anyone use Inbreeding and Linebreeding? Aren't these two methods known to produce undesirable traits and genetic recessive disorders such as HYPP in Quarter Horses or Lethal White syndrome in Paints, Severe Combined Immuno-deficiency (SCID) and Lavender Foal Syndrome (LFS) in Arabians? Is it true that in most breeds, this practice can produce disastrous results? Even within the Arabian breed as a whole it can produce lethal conditions that are heartbreaking. However, the original desert Arabian offers an advantage by avoiding these potential genetic disorders even while using Linebreeding and Inbreeding methods.

Why is this? Due to geographical isolation over the course of thousands of years, the Bedouin tribes often used these breeding practices which caused their stock to become extremely prepotent. However, when a foal that was undesirable or unhealthy was born, it died quickly or they killed it. They could not afford to feed and protect something with inferior qualities and genetics. The harsh conditions of desert life and the demands of tribal warfare were ongoing 'endurance' tests for every horse that had lived past infancy. So the Bedouins, in effect, practiced survival of the fittest to the

utmost degree and to the point that they eliminated most undesirable traits or genetic disorders leaving only the strongest individuals alive to reproduce.

Why then do we see any of these problems in Arabians today? When Arabians were exported to other countries, their blood was infused with impure blood and sometimes outcrossed with native stock. Today these horses are still called Arabians and are often registered as purebreds since their ancestors did not differ much in appearance from the small infusions of outside blood. Regrettably this was enough to reintroduce the genetic risk factors for these disorders.



Avalon Fadl Halim, Double Fa Daalim Grandson, by Sean Daaim

Fortunately for us, there are still a small percentage of Arabians that contain only the blood of the original Bedouin desert steeds. Again, I will use Sheykh Obeyds as my example but there are other subgroups that have remained pure. SO Arabians came from the Bedouins out of the desert and have been bred on without the infusion of outside or impure blood. This allows us a resource that continues to be void of most undesirables or recessive disorders. To this day there are no known cases of an SO Arabian dying of SCID or LFS. Since there is little chance of these traits showing up, we can utilize Linebreeding and Inbreeding to their utmost potential to produce extremely

prepotent individuals who will produce consistently for us. Consistency is one of the hardest things to come by when breeding horses and it is the hallmark of all great Arabian breeding programs.

Therefore in breeding programs there is a necessity for Crossbreeding/Outcrossing and Inbreeding/Line-breeding. One must produce prepotent individuals to keep the consistently producing individuals around, such as breeding Sheykh Obeyds to other Sheykh Obeyds to preserve that group. Breeders need to have Sheykh Obeyds or other prepotent individuals available when wanting to Outcross for Hybrid Vigor to other groups such as Polish, Russian, or even Egyptian. Without breeding to preserve the subgroups themselves and to replace them as a closed gene pool within the breed, there will be no outcross available in the future to produce Hybrid Vigor.

In the end we all choose that which is most pleasing to our eye. No one person or breeding program is more right than any other. Some prefer to follow a fad, some prefer to cross great lines to produce a good horse today and some choose to perpetuate the breed in its purest form for tomorrow. It was, after all, the original desert horse from antiquity whose beauty and character inspired the romance which still surrounds the Arabian breed today.

Jennifer Blosser holds a Bachelors degree in Animal and Poultry Science with an emphasis in Equine Studies and Large Animal Reproduction.

#### Works Cited:

Notter, David., et al. "Beef Improvement Federation Fact Sheet." Virginia Cooperative Extension Service. Aug. 1985: Publication 400-025.

Edwards, Elwyn Hartley, Ed. Encyclopedia of the Horse. 1977. Forward Alexander Mackay-Smith. New York: Random House, 1991.

Splan, R. K. "Horse Color – Who Cares?" Horse Production. 2002.

Authentic Arabian Bloodstock by Judith Forbis, P. 286.