

*The Healthy Horse*

**“To breed or not to breed”—making responsible breeding decisions**

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Shakespeare had Hamlet ponder what is perhaps the quintessential existential question: “To be or not to be.” Hamlet was contemplating his own existence at the time, but that same question could be asked of any creative endeavor we are deciding whether to undertake or sustain. While it may seem quite a stretch (and to some an egregious misappropriation of Shakespeare’s fine words), I venture to suggest that we consider this same question in the context of breeding horses.

It is one aspect of horse breeding that, in my opinion, doesn’t get enough air time: whether a particular horse should be bred. Breeding a mare or stallion just for the fun of it, because “I bet her foals would be lovely,” because “he has such good bloodlines,” or because s/he has an injury or other problem which limits other uses is not a good enough reason for creating another horse. Just because a mare has a uterus doesn’t mean it needs to be used. The same goes for a stallion’s reproductive parts; they don’t need to be used just because they’re there.

Sure, there is an inbuilt biological imperative to reproduce, in horses and in humans. However, that “call of nature” doesn’t have to be answered every time or in every individual in order for the species to survive. By taking it upon ourselves to control and manipulate the modern horse to our liking, we also assume the burden of *doing it responsibly*. And sometimes the most responsible thing you can do with your mare or colt/stallion is to *not* use that horse for breeding. There must be a good reason *for* doing it, rather than an absence of reasons for *not* doing it. In other words, the *why* must outweigh the *why not*.

If you’re debating whether to breed your mare, here are some questions that may help you make your decision:

- Why do you want to breed her? What is to be gained, and is it really worth it?
- Do you really need another horse? Or is there a genuine market for her foal?
- Do you have the space and the money to support a horse that you can’t ride for at least 2 years or a foal that you may not be able to sell right away?
- Do you have the resources if this young horse (or the mare) needs more extensive veterinary or farriery care than usual?
- Does your mare have any physical defects or propensities for disease that may be heritable? (More on this below.)
- Is her temperament good enough that you’d be happy to have another horse like her in your barn? Would others see it the same way if, at some point, you had to sell her foal?

If you're trying to decide whether to breed your colt or stallion, consider these:

- Why do you want to breed him? What is to be gained, and is it really worth it?
- Do we really need more horses like him? And is there a genuine market for his offspring?
- Does he have any physical defects or propensities for disease that may be heritable?
- Is his temperament good enough that his offspring will reflect well on him, the breed, and on you as the stallion owner? If not, have you considered the legal and moral responsibilities of knowingly producing more horses with his temperament?
- What criteria will you use to determine which mares you'll accept to be bred to your stallion?
- How will you handle the practicalities of breeding (visiting mares, A.I. vs. natural cover, etc.)?
- Are you prepared to deal with the difficulties of managing a sexually "switched on" stallion for several months of the year?

Before I go on, I should probably tell you my philosophy regarding horse breeding. It's simply this: *Every horse is of value and worthy of good care, kindness, and respect; but only the best horses should be used for breeding.* What constitutes "best" depends somewhat on the horse's intended use, but in every case it comprises two basic elements: (1) absence of physical defects and propensities for disease, and (2) good temperament.

### ***Physical Defects and Propensities***

All too often the primary reason a mare or stallion is used for breeding is because s/he has an injury or other physical defect which limits other uses. "Well, the darn thing's no good for anything else, so we might as well breed 'er." What these breeders don't realize is that they may well be perpetuating a propensity for injury or other defects in another generation of horses.

There are many conformation and constitutional defects in horses that have a heritable basis. By that I mean there is a genetic component to their presence or progression. However, it's not always as simple as direct transmission of a defective gene, and thus a clinical disorder, from one generation to the next. Equine genetics is a great, big tangle of factors and confounders!

Simply carrying a defective gene doesn't guarantee the outward expression of the associated disorder. For example, Quarter Horses who carry just one copy of the gene for hyperkalemic periodic paralysis (HyPP) may never have an episode of HyPP (a debilitating and sometimes fatal muscle disorder). For this and most other conditions that have a genetic component, whether and to what extent a defective gene is expressed in an individual horse is strongly influenced by the horse's environment and management (diet,

housing, footing, exercise program, farriery and dental care, stresses such as frequent travel and competition, etc.).

Tables 1 and 2 contain lists of conditions in horses that are known or strongly suspected to have at least some genetic component. Table 1 comprises conditions that may be seen in any breed of horse, and Table 2 lists conditions which are more-or-less breed specific.

**Table 1. Some conditions in horses that are known or strongly suspected to have a genetic component:**

- parrot mouth
- club foot
- poor hoof shape and horn quality
- cryptorchidism (retained or undescended testicle)
- umbilical and inguinal (scrotal) hernias
- osteochondrosis (OCD, wobbler syndrome, and other defects of joint development)
- angular or flexural limb deformities (crooked legs or “contracted tendons”)
- navicular disease
- upward fixation of the patella (“locking patella”)
- heaves (chronic obstructive pulmonary disease or COPD)
- other hypersensitivity disorders (e.g. hives, “sweet itch”)
- sarcoids, melanoma
- laminitis
- insulin resistance and its consequences (including developmental orthopedic disease, obesity-associated laminitis, osteoarthritis, and possibly equine Cushing’s disease)

(see next page for Table 2)

**Table 2. Some breed-specific conditions that are known or strongly suspected to have a genetic component:**

- hyperkalemic periodic paralysis (HyPP)—Quarter Horses and related breeds
- polysaccharide storage myopathy (PSM, EPSM, PSSM)—Quarter Horses and related breeds, draft breeds, warmbloods, and probably other breeds
- recurrent exertional rhabdomyolysis (RER)—Thoroughbreds, Standardbreds, Arabians, and possibly other breeds
- idiopathic laryngeal hemiplegia (ILH)—Thoroughbreds and possibly other large breeds
- recurrent uveitis (ERU, “moon blindness”)—Appaloosas, less often in other breeds
- combined immunodeficiency syndrome (CID)—Arabians
- lethal white foal syndrome (ileocolic aganglionosis)—Paints (specifically, overo x overo)
- hyperelastosis cutis (also called hereditary equine regional dermal asthenia, or HERDA)—Quarter Horses
- patellar luxation—Miniature Horses
- anterior segment dysgenesis (ASD)— Rocky Mountain Horses, other breeds with the silver dapple color gene (Shetland ponies, Icelandics, Miniature Horses)
- degenerative suspensory ligament disease (DSL/D)—Peruvian Pasos

These lists are by no means complete. There are many more uncommon or rare conditions documented in horses that appear to be heritable. Furthermore, genetic defects pop up from time to time in all breeds and breeding programs.

You’ll no doubt have noticed that several common conditions that aren’t usually spoken of as “genetic disorders” are on the list. The more we study various conditions in horses, the more we’re finding that genetics has a hand in the appearance or progression of the disease. It may simply be in the form of a genetic propensity for rapid growth and large body size (e.g. OCD, wobblers syndrome, ILH), altered insulin sensitivity (e.g. osteochondrosis, obesity, laminitis), or some other derangement of metabolic or immune function. These are the conditions whose expression or progression is most heavily influenced by environmental and management factors. In other cases, there is a more direct link between a defective gene and a particular disease (e.g. HyPP, HERDA, CID). The first list, in particular, is likely to grow longer as we continue to study the equine genome and specific clinical conditions in horses.

*The lessons of HyPP.* Hyperkalemic periodic paralysis in Quarter Horses provides a great object lesson for any would-be breeder. This genetic defect became widely disseminated in the Quarter Horse population because it went hand-in-hand with a physical trait breeders and judges of halter horses considered desirable: a very muscular physique. Unfortunately, good sense and moral responsibility were sacrificed for blind ambition by many Quarter Horse breeders, and this harmful genetic trait was knowingly perpetuated, generation after generation. Even today, with a highly sensitive DNA test for the defective gene and a breed society mandate that all Quarter Horse foals be tested and

their HyPP status noted on their registry papers, some breeders continue to breed horses who carry the HyPP gene—all for the insupportable reason that these horses win ribbons.

A whole lot of damage would have been avoided if more individual breeders had taken responsibility for the future of their breeding programs and the breed as a whole, and selectively bred only those horses who did not have this problem. Although a safe and sensitive test for the defective gene has been available for only the past decade or so, horses affected with this condition are obvious because the symptoms of this disease are obvious, even though they're intermittent. So, although it would have been difficult to avoid breeding all "silent carriers" of the gene before the test became available, it would have been an easy matter to avoid breeding known carriers (i.e. those horses who had one or more episodes of HyPP). Some breeders chose to take this path; others did not, to the detriment of the entire breed.

Sport horse breeders would be wise to take a page from the Quarter Horse annals. For example, polysaccharide storage myopathy (PSM) and recurrent exertional rhabdomyolysis (RER) are common underlying causes of exercise-related muscle dysfunction ("tying up") in warmbloods and Thoroughbreds, respectively. Recent research indicates that both diseases have a genetic component, although the expression of each is strongly influenced by diet, exercise, stress, etc. While the possible advantage of PSM remains to be seen, one of the characteristics of horses with RER is faster muscle contraction and relaxation than in unaffected horses, potentially making horses with this condition superior athletes (if only they didn't keep tying up!). We still know too little about the heritability and expression of PSM, and only a little more about RER. Even so, it may be wise to consider not breeding mares or stallions who have either of these problems. Neither condition is fatal in itself, and both conditions can be handled reasonably well with careful management, but neither condition could be considered good for the affected horse or for the breed.

*Conformation.* A quick commentary about conformation before moving on. In any species, breeding—i.e. blending the highly complex genetic code of two different individuals—is a bit of a crap shoot. You just never quite know what you're going to get. It is foolhardy to try to "balance out" one horse's conformational defect or other undesirable trait (e.g. a long or coarse head) in the next generation by choosing a mate who does not have that characteristic or has the opposite trait (e.g. a short or refined head). Comics had a field day when Billy Joel married Christy Brinkley. "What if their kids inherit *her* musical ability and *his* looks," they joked. Mean though that jibe is, it's worth bearing in mind when you're deciding whether, or with whom, to breed a less-than-perfect mare or stallion.

### ***Temperament***

The "nature vs. nurture" debate continues in human psychology circles, and likely will go on until the end of time. My simple conclusion is that it's both. Sure, our psychological tendencies and habitual behavioral responses are shaped by our life experiences, but there are some traits and tendencies we are born with that are unique to each of us. So, too, with horses. I agree in general with the adage, "Mean horses are *made*, not born." However, we've all come across horses who, from the moment they were born, were firebrands or grumpy old men or scaredy cats or sweet as pie. And then there are the horses whose heritage is evident as much by their temperament as by their build or their facial features.

So, if some part of the horse's temperament is determined before birth, and thus probably has a heritable component, then temperament should figure in the decision whether to breed a particular horse. The breeding of temperamentally difficult or downright dangerous horses just because they have some physical trait or ability someone considers desirable needs to stop! Not only do these horses hurt people, but these horses often are not treated well and they suffer considerably as a result. There is absolutely no reason to perpetuate the breeding of horses with bad temperaments.

By the same token, good temperament is not a suitable reason on its own to breed a horse. "Oh, but she's so sweet!" does nothing to negate the fact that she has crooked legs or heaves or some other potentially heritable defect. Her sweet nature is no justification for burdening her foal with those problems or propensities. Also remember that very few horses spend their entire lives with the person who produced them. At some point, you may have to sell or find another home for that foal, and it is much harder to place a "problem" horse in a good home than it is with a healthy, well-conformed, and equally good natured horse.

### ***The seduction of paper***

To close, I want to mention another common reason why people decide to breed a particular horse: because s/he has "good bloodlines." This one bothers me because what constitutes "well bred" or "good bloodlines" often is highly subjective (in the eye of the beholder) or based solely on winnings. In many sports and breed societies, it all comes down to which line is winning races or winning in the show ring. In other words, *money* is the fundamental decider of what constitutes a good horse. We even use terms like "valuable" and "high dollar" when describing these horses. It appears to matter very little whether these "well-bred" horses are able to *stay* healthy and have long and successful careers. The primary goal seems to be to win enough points or prize money before the horse breaks down that the owner can command high breeder fees or sell the offspring for top dollar. The big picture—the long-term result of today's decisions—is papered over.

Here's a good example of why basing breeding decisions solely on paper can turn out to be a house of cards. One very famous and widely used Thoroughbred stallion (now deceased) was always photographed standing in grass, rather than on a hard surface. That's because he had terrible feet (flat soles, flared walls, thin walls and soles, low-slung and under-run heels). So do many of his offspring, relatively few of whom have realized the potential expected of them based solely on their breeding. Poor hoof shape and quality is a very common reason for chronic, low-grade lameness or poor performance in athletic horses, and a prime reason why a horse may fail to live up to his genetic potential. Nevertheless, very few Thoroughbred breeders consider hoof quality in their selection of breeding stock. The few that do have dramatically reduced the incidence of lameness, training days lost to lameness, and the cost of hoof care, and they have increased their net earnings.

Making breeding decisions based primarily on coat color or pattern can be equally detrimental to the quality of the offspring and the future of the breed. The Appaloosa and American Paint Horse breeds are replete with examples of this type of "color blindness." Conformation and temperament are common casualties when the focus of the breeding program is to produce foals with flashy or showy coat color. The sport horse industry would be wise to take note in the selection and breeding of colored sport horses (e.g. crossing Paints with Thoroughbreds or warmbloods). By looking to the future using a

telescope rather than a kaleidoscope, the discriminating and responsible breeder will make sure that major faults are not overlooked for the sake of color.

Being well bred (or well colored) is not a good enough reason on its own for breeding a particular horse. The horse intended for breeding should be healthy and free from physical defects and propensities and have a good temperament. In addition, it would be ideal if the horse has also proven herself in the particular sport in which her offspring will likely be used. (The same standard should be applied to colts and stallions, too.) Showing some staying power in the sport—i.e. career longevity—is another huge endorsement for the particular horse as a potential breeding animal.

On a related topic, just because a breed society is willing to recognize the horse as “suitable” for breeding stock does not make that horse worthy of being used for breeding if s/he does not satisfy the criteria discussed above. Standards vary quite a bit from one breed registry to the next. The fact that some registries have relatively low standards for inclusion allows owners of less-than-ideal horses to “shop around” and register the horse as one thing or another, thereby enabling that owner to state that the mare or stallion is “registered.” Promoting these horses as breeding animals does the entire equine community a disservice.

No matter what our particular interest or involvement may be, we are all members of the equine community. It behooves us all to reach for a high standard of health and performance in the current and future generations of horses, and refuse to settle for anything less. Let’s treat every horse well, and with kindness and respect, but let’s choose only the very best to create the next generation.

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