

# GENETIC

By Robert M. Miller, D.V.M.

# ROULETTE

**Raising mules takes  
breeding skill, a horseman's eye,  
and dumb luck.**

**T**O PRODUCE superior horses, the breeder must take into account three inherited qualities: anatomy (conformation), physiology (function), and behavior (temperament). These basic qualities are genetically transmitted, and, to a great extent, are linked.

Thus a great race horse, for example, has the body conducive to running at high speed and (we hope) not breaking down under such stress. That's anatomy. He must also have the physiology to make a winning race horse: the reaction time, the stamina, the cardiovascular and pulmonary function. In addition, he must have the mind to race; the desire to not just keep up with the herd, but to be out front.

The same thing can be said about cow horses. They must be anatomically endowed, physiologically adequate, and mentally inclined to work cattle. This principle can be applied to producing any kind of performance horse, whether he be for endurance racing, eventing, draft, polo, or anything else.

Mules, who are becoming increasingly popular as saddle animals, present a special challenge because they are hybrids—the result of crossing two related, but different species, each with a different chromosome count and each with a unique anatomy, physiology, and behavior.

Before we consider the challenge of producing good saddle mules, we must understand the differences between the two species that are crossed to create a mule—the horse and the donkey.



*Like many Quarter Horse-bred mules, Lucky Three Stardust has Thoroughbred conformation, a good head, an exceptional neck with length and a small throatlatch that blends into a long sloping shoulder and strong back. The legs are well-muscled and balanced. The copped hock is the result of injury. The mule is now owned by Barbara Hunter of Hunter Mountain Farm in Virginia.*

The horse evolved as a plains-dwelling creature. His natural habitat is grassland prairie. His natural enemies are larger predators—the giant cats and wolves.

The horse's primary defense is flight. When frightened he sprints away from perceived danger. His anatomy is designed for sprinting, with long agile

legs, a respiratory and circulatory system suitable for running, and an incredibly fast reaction time that permits explosive movement.

The horse's behavior complements his body and helps keep him alive in the wild. Timid, nervous, flighty creatures lacking horns, tusks, or fangs, horses are the only common domestic

PHOTO COURTESY OF WENDY HOOKER



Owned by Meredith Hodges of Lucky Three Ranch, Loveland, Colo., Lucky Three Firestorm has Arabian and Quarter Horse breeding. The head is refined and shows the Arabian influence. The mule has a sloping shoulder, strong back, substantial bone, and a reasonably horse-like neck.



Lucky Three Desiree is Meredith Hodges' Appaloosa-bred mule. Pretty good head, very good neck (long, not upside-down like a donkey's), and smaller at the throatlatch. Like all good performance mules, her neck blends into a long sloping shoulder and good top line.

animals who, in the wild state, depend primarily upon flight for survival.

The donkey, an animal domesticated in many different cultures, is descended from the wild ass. Nearly all modern donkey breeds originated from African wild asses. Their habitat is rocky, sometimes precipitous desert terrain.

Like wild horses, the donkey's natural enemies are the larger predators of the cat and dog family, but because his habitat was different, the ass developed different anatomy, physiology, and behavior than that of the horse.

Blind flight can be dangerous in rough terrain. When he senses danger, therefore, the ass chooses from three options, and he may make his choice in an instant.

He may choose flight, as a horse

would. Or, the ass may elect to stand still, knowing that he is safe where he is. Under such circumstances, he may refuse to move, and that is where the reputation for stubbornness comes from.

His third choice: He may attack. Donkeys will commonly attack dogs. Some sheep men use donkeys to protect flocks against coyotes. In colonial California, it was common practice to run one jennet per fifty broodmares on open range, to protect the foals from wolves. This is the reason that mules, who are the result of breeding a jackass to a mare, will often attack dogs unless trained to tolerate them.

In breeding mules for saddle use, what we want to ideally achieve is, for the most part, the anatomy of a horse, the behavior of a horse, and

the physiology of a donkey.

Let's consider each of these separately.

**I/ Anatomy.** Unless the mule inherits mostly horse anatomy, he will not make a satisfactory saddle animal. Oh, the long ears are inevitable, and some mule breeders like them as long as possible, but the ears aren't important.

A good saddle mule must inherit the neck, shoulder, and withers of his dam, assuming, of course, that the dam is a mare of the best possible conformation. A mule with a donkey neck (having an upside-down curvature, a short neck, and a thick throatlatch) will not flex easily, vertically or laterally. Mules, at best, are stiff-necked. One with a donkey neck is usually impossibly so.

So, the neck, and the rest of the body, should be as horse-like as possible. If the mule is built too much like a donkey,



In Peru, Paso hybrids are greatly valued. This Peruvian Paso hinny was 4 months old when the photograph was taken.



Cover the ears, and this mule looks almost like a horse. This is Gummersall's Tillie, a Tennessee walking mule.



Laurel Miller with Jordass Jean. This molly is out of a registered 14.1 Quarter Horse mare of Poquita Mas and Barred breeding, and by a 14-hand Spanish (Catalonian) jack, El Windy Valley Adam. Jordass Jean stands 16.2 and is a perfect example of why I call mule breeding genetic roulette. A winner in both English and western events, she is of Thoroughbred type, with a refined head, slender throatlatch, a lean and well-angulated neck tying into a long sloping shoulder, and, for a mule, prominent withers. Because of her conformation, she moves like a horse, rather than like a donkey. Most mules can jump big, but most do not jump pretty. This mule tucks up and sails over jumps as gracefully as a good horse.

he will move like a donkey, with what I call a lolling gait in front, and with a lack of speed and agility. Top performance mules, except for the length of their ears, look remarkably horse-like, and they move like horses.

Good withers (not a donkey characteristic) help to hold a saddle on correctly, with minimal dependence upon a crupper or breeching. We also want the head to be refined and horse-like. Mules with oversized donkey heads are more likely to be heavy on the forehead.

I like a mule to have a horse-like foot. The toughness of the donkey foot is desirable, but the shape of the foot works better if it is broader and less upright than the typical donkey foot.

**2/ Behavior.** Good saddle mules are more horse-like than donkey-like in their behavior. We want the flight instinct of the horse. Why? Isn't this why horses so frequently injure themselves or the people around them? Yes, this is true, but the flight instinct is why horses are so useful to us. We can channel that instinct down the racetrack, over fences, into the collar, around the barrels, or after a cow. The donkey's inclination towards balkiness or aggressiveness is not desirable in a trained saddle animal.

Donkeys, being less flighty than horses, usually need constant urging to keep moving. This is not only true at faster

gaits, but often at a walk as well. We have all seen films of people riding donkeys in Third World countries, encouraging them to walk faster with the constant use of a stick. Many mules inherit this quality, and, even though they are capable of high speed when they feel threatened, require constant urging to move forward during ordinary riding.

Again, there are exceptions to this preference for horse behavior. For example, the very fact that donkeys make choices when they feel threatened can be an advantage to the rider, as well as a frustration when mule behavior is evaluated. Mules are less likely than horses to go into dangerous footing, less likely to bog down, and are very sure-footed in steep terrain. They are less likely to panic and struggle if caught in barbed wire. Mules tend to be less quarrelsome and more sociable than horses.

**3/ Physiology.** It is the physiology of the donkey that we want in our mules. We want their extraordinary stamina, their great physical strength, their ability to withstand very high environmental temperatures, and to go for long periods without water. After all, the donkey is a desert animal. Wild burros in our western deserts stay sleek and fat in regions where horses cannot survive at all. We want the long life of the donkey. It averages a decade longer than a horse's life. We

especially want the incredible toughness of their limbs, so resistant to most of the lamenesses that plague horses.

Okay, so we want a mule who looks more like a horse than a donkey, but not completely, thinks more like a horse than a donkey, but functions physiologically more like a donkey than a horse. How do we achieve this? We do it with a combination of three factors—skill in selecting the mare, skill in selecting the sire, and dumb luck.

**1/ Selecting the Mare.** This is the easy part. Regardless of the breed, only refined mares should be used to produce mules. The mules of the past were mostly ugly creatures because cull mares were used to produce them. The handsome mules who predominate in today's shows are out of fine, well-bred mares.

In general, the future use of the mule should determine the kind of mare used. If you want a racing mule, breed a racing mare. If you want a jumping mule, it is logical to use a proven jumping mare. In any case, avoid coarse mares because, however refined the jack is, he cannot add refinement to his offspring. Use a refined mare, as elegant a mare as possible, to produce a mule foal.

**2/ Selecting the Jack.** Most mule breeders knock themselves out looking for jacks with certain qualities, such as speed, pretty heads, smooth gaits, etc. I have a different concept.

I think that a good mule sire lacks prepotency. Prepotency is the ability of a sire to transmit his qualities to his offspring. That's important in stallions. I believe that it is just the opposite in the jacks used to sire mules. You want a lack of prepotency. All you want from that jack is his physiology—that hybrid vigor—and that comes automatically. You want the mare's characteristics to prevail. Then, if you use really good mares, your mule foals will have the anatomy and behavior of a horse for the most part, and that's what makes a good saddle mule.

**3/ Dumb Luck.** Assuming that you have paid attention to carefully selecting the mare and jack, and a mule foal is the result, there is that unknown and unpredictable quality of luck. That's why I call mule breeding *genetic roulette*.

You may do everything right and end up with a mule suitable only for packing. Or, you may do everything wrong and end up with a mule who will outperform good horses.

Mules inherit all of their qualities from their parents. One is a horse;



*The author on Scooter. She is out of a Hobby Horse Quarter Horse mare and by a 13-hand jack. Cover her ears, and she looks like a handy little cow pony. This one came out exactly as we predicted.*

the other is a donkey. Some mules whinny and some bray. Some mules *lollop* along like donkeys and some flatten out and sprint like a champion Quarter Horse. Some mules have horse tails and others have donkey tails. Some have horse feet and others have donkey feet. Some have four chestnuts like a horse and some have only two, like a donkey.

I want a mule who moves like a horse, acts like a horse, looks like a horse, but has the toughness and smartness of a donkey. So far, I've been lucky. I must have dumb luck.

*Robert M. Miller recently retired from a veterinary career in the Thousand Oaks, Calif., area. He has long been a contributor to this magazine, and is the author of the WH books, *Health Problems of the Horse* and *Imprint Training of the Newborn Foal*. 🐾*