

The Species

IN THE WORLD OF HORSES, SIMPLY KNOWING how to ride or professing a love of horses doesn't make you a horseman. That badge of honor comes from knowing a horse inside and out: knowing how he thinks, how his body works, and how best to work in harmony with the often-puzzling qualities that make horses... well, horses. The very qualities that attract us to these unique creatures can also be the downfall of many an inexperienced trainer or caretaker.

Those who do understand equine behaviors learn to love their horses all the more for them. Often, our horses do the opposite of what instinct tells them they should do, simply because we ask them to and they trust us. It's a covenant that every horse owner should understand and respect.

The essence of “horseness” comprises two parts, the mental and the physical. To be a real horseman, you need to know the depths of the equine body and soul.

When you consider a horse's physical being—his body—it's truly an example of a living machine that is perfectly adapted to its environment. The equine is a highly effective grass-to-manure conversion factory with a sensitive surveillance system, all wrapped up in a sleek, aerodynamic package that can travel at speeds of nearly fifty miles an hour.

Thanks to a remarkably complete fossil record, we can see exactly how today's horses came to be the creatures they are. Scientists can trace the evolution of the horse from *Eohippus*, the fox-size “dawn horse” of fifty-five million years ago, all the way to modern-day *Equus caballus*, who first appeared in the last million years. Over the millennia, horses have grown taller and longer-legged, presumably because the added speed and agility made them better able to elude the predators that evolved along with them. Horses' teeth also changed, becoming better equipped for grinding as their diet came to consist more of grasses than of vegetation and fruit. Most notably, their multiple toes evolved to become a single hoof, corresponding with their adaptation from being a forest-dwelling creature to one that roamed open plains.³

Likewise, understanding the horse's mind comes from knowledge of the way the horse lived in the wild, how she interacted with others, how she spent her days, and how she stayed out of the clutches of predators and lived to reproduce another day.

Does this seem like ancient equine history? Although pampered show horses and sedate trail buddies might seem far removed from the wild horses who roamed the plains, knowing where horses come from is integral to understanding the way they are today. Domestication is only a very

recent development: horses are the way they are because they were required to be that way to survive in the wild for millions of years. Keeping the equine “design plan” in mind helps to make sense of the things horses do and what they require to be happy and comfortable.

A Day in the Life of a Horse

Most horses live their lives on a schedule their human beings set for them. Eat, go out, come in, eat, get ridden, eat, go out—that’s pretty much the schedule. But what about horses left to their own devices? How do they spend their days when they, not human beings, decide how their time is spent?

Whether horses are wild and free-roaming, or domestic and confined to pasture, they exhibit similar preferences for how they spend their time when given their own free will. The vast majority of a horse’s day is spent grazing. That single activity occupies 50 to 80 percent of his time over a twenty-four hour period. Horses graze in spurts throughout the day and night, although a number of factors can influence when and how long they graze. Horses spend more time grazing when forage quality is poor or when their nutritional needs are increased (such as when pregnant or nursing a foal). They may alter their grazing patterns due to weather or biting insects, choosing to stand in the shade during the hot, buggy times of the day. But, despite day-to-day variations, the one constant is that the horse spends most of his day eating.

When horses aren’t grazing, they’re usually sleeping, either dozing lightly or sacking out for deep sleep. Horses don’t take a long, uninterrupted period of sleep as humans do. Rather, they sleep for short periods of time throughout the day and night, with the cumulative amount varying from day to day and horse to horse, depending on weather and other factors. Horses who are stabled tend to sleep more than those who are at pasture, but still only sleep for a few hours each day—much less than the eight hours human beings sleep or the ten to twelve hours dogs and cats enjoy.

The horse is aided in this endeavor by a unique system of tendons and ligaments known as the “stay apparatus,” which allows the horse to lock his legs, relax his muscles, and sleep lightly while remaining standing up. The horse stands with one hind leg cocked and resting, his head hanging low, ears and lips drooping, and his eyes fully or partially closed.

Horses do sleep lying down as well, some more than others. Most lie down for at least a brief period once daily, either flat out on their sides or propped up on their chests with their legs folded beneath them. Due to horses’ large body mass, lying down is actually less relaxing for them than sleeping standing up; the weight of the horse’s own body puts pressure on internal organs when he is lying down and may cause additional stress on the heart and lungs.⁴ Horses only lie down for short periods, which is also why it is so difficult for horses to recover from severe injuries like broken legs. A human is laid up in bed for six weeks while such an injury heals, but this simply isn’t physically possible for a horse.⁵

Like humans, horses experience different stages of sleep, characterized by different brain-wave patterns (measured by an electroencephalogram). In slow-wave sleep, brain activity is much slower than it is in an awake animal, but the quality of sleep is relatively light and the animal can be roused easily. In paradoxical or REM (rapid eye movement) sleep, the brain is more active. It is during this period of sleep that humans, and presumably animals, experience dreams, but the muscles of the body are very relaxed. This is a much deeper period of sleep from which it is more difficult to awaken.

Because of the state of muscle relaxation that occurs, horses must be lying down to experience REM sleep. It is possible for horses to become sleep deprived if they are unable to lie down, and thus unable to partake of REM sleep, for extended periods.⁶

Dealing with the Elements

A horse’s day-to-day behavior can be summed up as an endless cycle of “eat, sleep, repeat,” but keep in mind that this year-round proposition

requires seasonal adjustment. Horses aren't able to dig burrows or create nests or other shelter to protect them from the elements, whether it's summer's heat or winter's chill. They have to make do with windbreaks provided by hills or stands of trees, shade where they can find it, and the heat their own bodies can generate. Through a combination of physical attributes and instinct, however, most horses are ably equipped to handle whatever Mother Nature sends their way.

Horses generally are able to handle extremes of both cold and heat, although there can be great variation among breeds and individuals. For example, an Arabian, with his desert heritage, is better equipped to handle oppressively hot weather, while a Shetland pony, whose ancestors hail from the harsh islands of Scotland, is more impervious to bitter winter chill. Individual horses also have the ability to adapt to their own surroundings, however; so an Arabian who was born and raised in Ontario might actually fare better in a harsh winter than would a Shetland pony raised in Florida and abruptly moved north.

To stay warm in the colder months, horses begin growing a long winter coat (replacing their sleek summer one) when the days begin to shorten. The length of hair itself does its part to keep the animal warm, but horses (and other animals) are also equipped with muscles under the skin that cause the hair of the coat to stand on end when the animal starts to get cold. This traps air in the now-fluffy hair coat, which adds another insulating layer. (This phenomenon is also responsible for human goosebumps, although it does little to keep us warm.)

Horses are often quite comfortable outside in cold temperatures or wintry conditions and can continue grazing rather than seek shelter. More bothersome than the thermometer reading is the wind and wet, so savvy equines seek shelter in the form of buildings, hills, or stands of trees, turning their tails to the wind and standing in close proximity to one another to take advantage of neighbors' body heat.

Horses are also able to shiver to generate heat, and the action of digestion generates heat to help keep them warm as well.

A horse's primary defense against the heat is to sweat. Glands in the skin release sweat to the skin's surface, and the action of evaporation helps to cool the body. (The process of sponging a horse off with water after a ride does the same thing.) Horses are quite proficient sweaters, giving rise to the phrase, "sweating like a horse."

An additional aggravation for horses in warm weather is bothersome biting insects. At best, they annoy a horse and distract him from eating or sleeping; at worst, insects can draw blood with painful bites and can harass a horse to the point of making him frantic for relief.

Horses are equipped with subcutaneous muscles that can make certain portions of skin twitch rapidly in an attempt to dislodge insects. If that and a swishing tail are insufficient, a horse usually retreats to a less buggy spot and waits out the pests.

Form Follows Function

It's important to understand the way horses were intended to live in the wild, because that's the lifestyle for which their bodies were designed. Domestic life is quite different. Often we ask a horse to live in a completely unnatural state, and doing so can have adverse consequences. A smart caretaker keeps in mind the way horses are *supposed* to live and tries to tailor the horses' barn-kept lifestyle to approximate it.

Perhaps nowhere is this more important than when considering the equine digestive system. Of the myriad things that can go wrong with horses, digestive tract problems are responsible for considerably more than their fair share.

If you think about a horse's diet and eating habits, it should be immediately apparent that his digestive system is somewhat different from yours, as an omnivorous human being, and different from your carnivorous cat or dog's. Horses are herbivores; their diet is comprised entirely of plants, so their digestive system is geared toward using those foods. And while carnivores spend their days hunting and eating a large meal when they make a kill, herbivores spend their days grazing: a "meal" is an hours-long event.

Keeping those differences in mind, let's take a look at the equine digestive tract. We begin at the very beginning, with the horse's mouth. Horses have agile, expressive upper lips, capable of wiggling gate locks open and offering the goofy equine equivalent of a smile. Study a horse as he grazes sometime, and you'll see that lip in action in its natural environment. Seeming to have a mind all its own, it ferrets through the densest vegetation in search of the good stuff and ably steers those choice bits into the horse's mouth. Once the grass is guided into the mouth, the horse's teeth—adapted over millions of years for this specific diet—tear it off and chew it.

When the horse swallows, food moves down the horse's esophagus via a process called peristalsis, a wave of contractions in the muscles ringing the esophagus that pushes the food along, in much the same way you squeeze the last bit of toothpaste out of a tube. You can actually see the wave of muscle action move along the bottom of a horse's neck when he swallows.

The esophagus empties into the stomach, and here we find one of the oddities of the equine digestive tract. The muscular valve found at the junction of the esophagus and stomach allows only one-way passage. This means that horses are unable to vomit (or burp), except in very rare circumstances that involve very severe digestive illness. If you've got unpleasant memories from a recent bout of the flu, not being able to vomit might seem like a good thing, but it means that a horse is unable to resolve simple cases of digestive upset by expelling whatever is causing the problem. This is why equine digestive problems are considered so serious and are quite frequently life-threatening.

Herbivores are classified by the way they digest plant material; they are separated into ruminants and nonruminants. Cattle, goats, and sheep are ruminants, meaning they chew a cud and their stomachs have four compartments. Horses are nonruminants and thus have a simple single stomach, as do humans, dogs, cats, and pigs.

The equine stomach is small relative to the animal's overall size. Its maximum capacity is about four gallons, but it functions best when it

contains about two and a half gallons of food. It's designed to handle small amounts of food at frequent intervals (which, considering the natural state of grazing in the wild, makes perfect sense).

The stomach fills up as the horse eats, and when it's about two-thirds full, digested food begins to exit (via another muscular valve) into the small intestine to make room for more food coming in. If a horse consumes a large amount of food at one time, however, material must be rushed out of the stomach before it has been digested properly to make room for additional food coming in. The process is designed to accommodate the leisurely eating habits of a grazing animal and is disrupted when a horse consumes food in a less natural manner.

In the small intestine, various enzymes act on fat, protein, and carbohydrates to break them down into the basic components that can be absorbed through the intestinal wall and into the bloodstream to be used by the body. The system is designed for a grazing animal and is optimized for frequent, small deposits of digested material. When a horse consumes very large meals, certain enzymes are not as effective.

Muscle contractions move the contents, mostly fibrous material and water by this point, through the small intestine and into the large intestine. This portion of the digestive tract has a large capacity and is relatively slow, as the bacteria in the gut need ample time to ferment and break down the fiber that comprises a great portion of the horse's diet.

As digestive material nears the end of the large intestine, most of the useable nutrients and water have been absorbed; what's left is formed into fecal balls and exits the horse's body. At this point, it becomes a matter for you and your pitchfork!

So why is understanding this anatomy important? Because today's horses often aren't kept in the manner for which they were designed and often don't eat the diet they were intended to eat in the way they were intended to eat it.

As the human population expands and more land is developed, there's less room for farms and pastures. Even those folks lucky enough to have some acreage often don't have the amount necessary to keep horses out

grazing twenty-four hours a day, seven days a week. Instead, many horses find themselves in a completely unnatural environment, spending a good portion of their days in stalls and eating highly concentrated sources of energy in the form of grain rather than their natural staple of roughage.

Deviating too far from the horse's natural diet and way of eating can lead not only to inefficient use of nutrients (which means a good portion of the expensive grain you're feeding is going straight from the feed bucket to the manure pile without benefiting your horse), but also to severe digestive problems that can affect performance or require dangerous and expensive surgery. It can even be fatal.

The most common digestive issue in horses is colic, an all-encompassing term used to describe most any kind of abdominal pain. (We examine colic more thoroughly in chapter 10.) Horses can colic from eating too much grain or from not having enough roughage in their diets, among many other causes. Severe colic cases often require surgery (which is a risky proposition in itself) and may result in the horse being euthanized. In fact, colic is considered one of the leading causes of death in adult horses.⁷

Gastric ulcers are another common digestive ailment, frequently found in high-performance show and racehorses. Ulcers can have many causes, but a diet that includes large quantities of grain is considered to be a contributing factor.

Proper management is no guarantee against colic or other digestive ailments, but it minimizes the risk considerably. Try to imitate the natural diet as much as possible, relying on roughage (hay or pasture) for the lion's share of the horse's daily calories. The age-old feeding mantra is "little and often," meaning small amounts of food at frequent intervals. Grain should be fed only as necessary and doled out in multiple small meals (two or three times daily) rather than in one big one.

Avoiding Becoming a Lion's Lunch

There's much to be gleaned from understanding the way various equine bodily systems work and the many practical applications to everyday horse-keeping. Equally important is an understanding of the equine mind, and to delve into this, we once again consider the way horses exist in nature.

The horse is a prey animal, meaning that large carnivores like wolves or mountain lions are quite happy to eat the horse for lunch. His survival depends on being alert to any approaching predators and his ability to get away before it's too late.

Thanks to Mother Nature, the horse is well equipped for this. The horse's eyes are placed along the sides of his head, rather than in the front, as they are in humans, dogs, and cats. This gives the horse a field of vision of about 330 degrees—almost a complete circle around his body—without even moving his head. Since he's blessed with a long neck, he's able to turn and look directly behind him, expanding his field of vision to a full 360 degrees. Without moving his feet or twisting his body at all, the horse can see easily in all directions. His vision is quite good, compared to that of other non-primate mammals; it's better than a dog or cat's and almost as good as a human being's.

Couple those two attributes with the horse's keen senses of smell and hearing, and his ears that can swivel to and fro like little satellite dishes, and you have an animal who is extraordinarily tuned into his surroundings. A crackle in the brush in the distance? Head is up, ears are cocked toward it, and he's assessing the situation to see if there's any danger. Something moving across the field behind him? He's seen it without even having to turn around.

Of course, noticing an approaching danger doesn't do a horse much good if he's just going to sit there and wait for it to arrive. Contrary to cinematic depictions of stallions fighting to the death, when it comes to the age-old question of "fight or flight," horses usually choose flight. They don't even consider their options—they just run. Speed is a horse's

ally, and it's better for him to run away from nothing than to end up as a mountain lion's lunch because he paused to think about it.

You don't need to observe horses in the wild to see this instinct in action. In fact, if you've spent much time around horses at all, you've likely experienced the phenomenon of the "spook," when a horse spots some kind of equine-eating monster (invisible to everyone else, of course) in the most innocuous of places and takes off in a panic. Usually the culprit is something like a blowing plastic bag, or an overturned bucket, or...anything, really. That's the point. Instinct tells the horse that he should simply run away from anything he finds suspicious, rather than investigate to find out that, yes, it really is just a bucket.

Although it's no fun to fall off when your horse spooks at a lawn chair and spins out from underneath you, it's important to understand that this is something intrinsic and central to a horse's very being. After all, natural selection favored the horses who ran away instead of those who stood their ground to sniff the mountain lion! The flight mentality is a tendency that can be a little more or a little less prevalent in any individual horse, but it's there in all of them.

Good horsemen and trainers help horses learn to overcome this innate fear through careful engineering of good experiences, desensitizing, and establishing trust. When a young horse is taken to a local schooling show just to hang out and see the sights while munching grass, this introduces in an unthreatening way the concept of showing and all the hoopla that goes with it. The horse leaves the show with nothing but a pleasant, relaxed memory, rather than a sense that there's something to fear.

When working at home with a young horse, a thoughtful rider doesn't punish a spook, but recognizes it for what it is, the horse's natural reaction to a frightening situation. Imagine a young Quarter Horse who's just getting started under saddle with arena work. She's convinced that the new tractor parked outside the arena will eat her if she gets too close. Her handler calms and steadies her, lets her study the tractor from a distance, and then slowly and quietly leads her gradually closer, and closer, and closer until she's near enough to sniff the tractor with a carefully outstretched nose

and see there's nothing to fear. Her handler leads her back and forth in front of the tractor several times, praising her for being brave, until she's calm and even bored with the situation. Then it's back to work, with nary a worry about the "horse-eating monster" in the corner.

Thanks to that good training, the mare can go on to have an impressive reputation for quiet behavior, giving hardly a thought to scary things like wind-whipped flags around an arena or raucous crowds, because she's been taught to trust in her human rider and focus on her job.

The extent to which horses can learn to suppress their flight instinct through proper training and trust in their handlers is remarkable, really. So much of what we routinely ask horses to do goes against their better judgment—getting into small, confined spaces like horse trailers; jumping huge obstacles without being able to see where they'll land on the other side; standing in the middle of busy traffic on a crowded city street. Not all horses are able to overcome their natural fears to such a degree, of course, but careful training and understanding the way the equine mind works can help almost any horse learn to cope with scary situations.

Ignorance of the horse's natural instincts can lead a handler to assume a horse is misbehaving when she's simply frightened and to punish a horse inappropriately, creating an even less trusting animal.

The Herd Mentality

Although horses are well equipped to be on high alert for danger, no animal can maintain that state of readiness all the time. They have to sleep, after all. Horses, like many other prey animals, find safety in numbers. The herd is an insurance policy—if one horse is dozing and doesn't hear the approaching wolf, another horse might, and his hasty departure will alert the other horses to the danger.

Wild herds usually include three to twenty horses, and are either a "bachelor" band of young stallions or a harem of mares and their offspring led by a mature stallion (who is continually challenged by younger stallions seeking to take over his harem). The mares within a herd usually stay

there, although their offspring leave the band when they're old enough, preventing inbreeding between a stallion and his progeny.

Domesticated horses don't need the herd's protection, but the instinct to stay together is still strong. Horses are social creatures. They enjoy company, primarily that of other horses, but in a pinch, even a goat or a donkey is an acceptable substitute. They generally graze in loosely knit groups rather than strike off on their own. They develop friends within the herd, often engaging in mutual grooming or fly-swatting. And when separated from their herd, they can get anxious and upset, calling back to the group and pacing nervously. A horse who is extremely herd-bound can be difficult to work with and to train, as he is distracted and nervous whenever away from his friends.

The equine herd is a complex social structure in which each member is keenly aware of his place. The highest-ranking horses have first priority for resources, such as food, water, or the choice shady resting spot. Horses who are lower in the hierarchy simply yield to those who occupy a higher social position.

In wild herds, the stallion is usually in charge, with other members sorting out their places by virtue of age and the length of time they've been in the herd. An older mare assumes the role of "alpha," leading the band on its travels to water sources and grazing areas, while the stallion drives the herd from behind. The stallion occasionally is challenged for control of his harem by younger stallions; if the younger horse wins the battle, he assumes the leadership position in the herd, and the former leader, vanquished, must find another herd.

In a herd of domestic horses, the roles are not defined so rigidly. There's generally no de facto leader, unlike the stallion-led wild herds; in domestic herds, the horses simply sort out who the leader is among themselves, independent of age, sex, size, or length of time in the herd.

If you've ever seen a new horse turned out with an established group, you've seen how this process works. The squealing and posturing, the laid-back ears and bared teeth, the double-barreled kicks, all are acts of aggression that horses use to sort out a dominance hierarchy among

themselves. It can be a little hair-raising to watch sometimes, and, of course, human beings should stay nearby to separate horses if need be. But generally, after lots of squealing and some nicks and scrapes, the newly reordered hierarchy is set and everyone coexists peacefully. If a horse ever forgets his place and oversteps his bounds with a horse above him in the hierarchy, the more dominant horse needs only to threaten to bite or kick to put the submissive horse back in line—there's no need to go through the whole production again.

The dominance hierarchy gives the group stability. It can change over time, or if one horse is removed from the group and later reintroduced. But for the most part it stays relatively constant. Even when horses are moved to a new herd, they often adopt similar positions. Certain horses always tend to try to occupy the “alpha” position, while others are content to submit and be lower-ranking members of the herd. And the alphas might not be who you would think—mares can be dominant over geldings; small horses can be dominant over large ones.⁸

Although we humans tend to anthropomorphize—feeling pity for the horses who are lower in the hierarchy, or feeling that higher-ranked horses are being “mean” to their subordinates—it's important to remember that this is a natural behavior for horses, and that a stable hierarchy prevents constant squabbling over position and access to resources. It may seem unfair that certain horses have a lower social position than others (some owners blanch to see their “expensive” show horse submit to a scruffy pony), but horses shouldn't be punished simply for acting on their instincts to establish peace in a group situation.

In some cases, though—say, when herds have two very “alpha” horses constantly fighting with each other for supremacy—a stable hierarchy may never be established (or the horses' owners might simply lose patience with the ongoing fighting). In these situations, it might be best to rearrange the herds if possible, splitting a large group into two smaller ones and putting the alphas in separate groups, for instance.

While horses should be allowed to sort differences out among themselves, there should always be one leader in the “herd” whose position is



Ears pressed back, an angry horse turns to defend himself from a pursuing dog.

unquestioned—the human handler. Learn to understand the equine body language that depicts aggression, like the flattened ears and bared teeth that signify a horse is threatening to bite, or the rump turned toward the handler with a leg cocked, threatening a kick. Horses should never be allowed to show aggression toward any human being. If such behavior is allowed to continue, the horse might become dangerous to handle, and certainly difficult to work with and train. Humans should always be unchallenged in their position at the very top of the hierarchy.

Humans use their superior reasoning ability, knowledge of equine behavior and of their own equine herds in particular—not kicks, whips, or nearby farm implements—to maintain respectful order on the ground, of course. Horses who push past human handlers to charge into the field ahead of them; who won't stand still to be mounted or administered to by a veterinarian or farrier; who crowd handlers while being led, need some lessons in horse/human etiquette. Manners are a wonderful gift to a horse.

A Very Different Environment

When considering all the aspects of horses' behavior, it's striking to realize how dramatically different we have made their lives in domestication. Rather than slowly ambling along an open plain all day, a horse might be cooped up in a twelve-by-twelve box for all but an hour a day. Instead of constantly nibbling grass, a horse might get a tub full of highly concentrated grain to devour in a few minutes and a paltry flake of hay to occupy him the rest of the day. Rather than enjoying the social camaraderie of a herd, horses might find themselves isolated in individual turnout paddocks, unable even to sniff noses with a friend across the fence.

These substantial changes in a horse's lifestyle can have physical consequences, as in the case of colic, as well as psychological effects. Imagine a horse who bares his teeth and lays back his ears whenever someone opens his stall door. He's incorrigible to handle, nipping whenever he gets a chance, and bulldozing his way down the barn aisle with no respect for his handler's tugs on the lead shank. Under saddle, he bucks and tries to take off. And on top of everything else, he has just about destroyed his stall, gnawing away giant portions of the wooden boards.

Would you buy such a horse for your young child? Or would you consider him dangerous and disagreeable?

Imagine the same horse after some significant management changes. Instead of being allowed fifteen minutes of turnout daily in a small dirt paddock, he now goes out in a large field for twelve full hours with a group of other geldings and has a chance to play and "get his bucks out." Instead of a huge portion of sweet feed, he now receives a much more modest serving of a pelleted feed and plentiful helpings of hay. The increased turnout, combined with a more reasonable diet, diminishes his nervous energy, and he's now pleasant and able to focus under saddle. He no longer acts aggressively toward his handlers or misbehaves on the ground because he no longer is trying to act out his unhappiness.

The cribbing has all but gone, now that he's getting an ample oral workout from grazing and his hay.

When uneducated horse owners fail to recognize the effects of an unnatural lifestyle, their horses are blamed for acting out when it's really no fault of their own.

Fortunately, in most cases, a happy medium can be struck between what the horse needs and the realities of suburban horse-keeping. But it falls on the caretakers to recognize the unnatural demands that can be placed on their horses in these situations and to examine possible causes and solutions before blaming the animal.