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Fact Sheet 98-29

Horse Handling And Riding Guidelines Part I: Equine Senses

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Introduction:

Horses play an important role in the recreation of many individuals today and "I continue to do so in the future. More and more people are participating in horse ownership and in various horse activities such as rodeo, racing, horse shows, and recreational riding. What ever your purpose for owning or using a horse may be, an understanding of basic horse handling and riding concepts will help make your involvement safer, more successful, and more enjoyable.

There are many ways of doing things. Often, trainers do not agree on methods of handling horses. Some may be almost opposite in their methods, but quite frequently get similar results. Keep in mind that the information presented is based upon basic scientific concepts and proven methods known to be safe for both horse and handier.

Horse Behavior and Senses

The horse evolved as a creature of open spaces and by means of natural selection acquired certain genetically fixed physical and behavioral characteristics essential to survival in its natural environment. Basic behavior of the horse reflects a period of time when it lived on the open plains. Nearly all horse behavior is in some way related to self preservation. A basic understanding of equine behavior and senses is important to effective communication, training, and riding the horse for any purpose.

Some examples of survival characteristics are listed here:

Physical	**Behavioral**
Conformation	Creature of Habit
Speed	Routinist
Vision	Herding Instinct
Olfactory	Flightiness
Auditory	Continuous Grazer

Some survival characteristics have been modified but not eliminated by domestication. Frequently, today, such characteristics are considered to be vices or undesirable habits.

Before considering the above characteristics as related to the handling and riding of horses it would perhaps be worthwhile to first consider the equine mind. Horses have been considered to be animals of low intelligence. However, there are different kinds of intelligence and no general measurement. Research has demonstrated that animals have different abilities or aptitudes for different kinds of work. Intelligence includes the ability to reason. Some have said the horse is not able to reason. However, some studies demonstrate the horse has some ability to reason. Keep in mind that the horse does not need a high level of reasoning ability for survival. It is also important to understand that the horse learns readily. New tasks are not difficult to learn if the cues given influence the stronger senses such as touch, sight, and hearing. Horses have very good memories. All experiences are recorded at the same level of consciousness and are not easily forgotten. Successful horse trainers are aware of the limited reasoning ability of the horse and focus training on the positive characteristics of the horse.

The Special Senses

The eyes, cars, and nose are specialized sensory organs of the horse. These structures provided for the survival of the horse throughout time as they increased the horse's awareness to its surroundings and enabled it to respond to danger. The nature of the horse is to run from danger rather than to fight its enemies. Survival was therefore based on the horse's perception of sight, sound, touch, or smell.

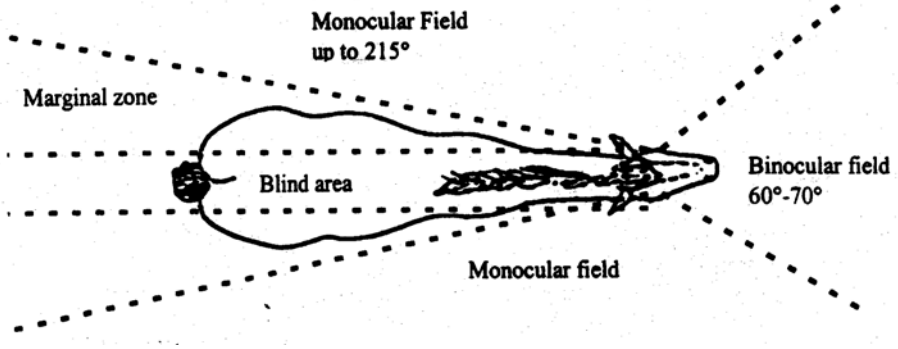
Vision

Vision in the horse is somewhat unique. The shape of the eye, distance between the eyes, and their placement on the head allows the horse to see with two types of vision. They are referred to as binocular and monocular vision. Eyes can be used together to focus on an object in binocular vision. Each eye can also be used independently when using monocular vision. This system of sight was important to the survival of the horse that is a prey animal. Knowing how the horse sees helps us to understand why the horse often reacts to different stimuli as it does.

Monocular Vision

The eyes of the horse, a prey animal, are set wider apart as compared to those of a predator. Consequently it can see large areas to each side of its body. This type of vision was developed to provide the horse protection from its predators, as it could see a threat coming form either side without turning its head (Figure 1).

Figure 1.



The horse almost has a continuous focus from a distance of about 3 or 4 feet forward. At distances less than 3 or 4 feet the horse has limited ability to focus. A horse will raise its head to see close objects and will lower its head to see distant objects. When an object is closer than 3 or 4 feet the horse cannot use binocular vision.

Visual perception and sharpness is rather poor in the horse as compared to other domestic animals.

The field of vision in the horse is about 215 degrees for each eye with a blind spot directly in front of the horse and one directly behind (Figure 1). The wide set eyes of the horse allow it to have a panoramic field of vision, to the extent of seeing nearly everything around itself with only minimal head movement., For this reason it is almost impossible to approach a grazing horse without the horse knowing it. Although the horse has poor depth perception it can detect movements far in the distance.

The shape of the head, size of the eye and jaw, and position of the head all influence the field of vision in the horse. It may be restricted in some individuals as the length of head and size of muzzle and nostrils increase. The ability of the horse's eyes to adjust to changing light conditions is much slower than in humans. When a horse moves from an area of bright light to one of dim light, or vice versa, the eyes of the handler adjust more rapidly to differences of light intensity than those of the horse. Therefore, one should give the horse some time to adjust to differences in light when going into unfamiliar places such as stalls, arenas, or trailers.

Rods and cones are two photoreceptor cell types found in the eye. Cones regulate day vision and function in color discrimination. Rods are more light sensitive and function in low light intensity or in the dark. The human eye has a high percentage of cones whereas the eye of the horse has a high number of rods. Although it appears that the horse is not able to distinguish color it does have superior night vision. Whether or not horses can see color is not completely known. Some studies have demonstrated that horses may be able to differentiate shades of yellow and green but not red and blue. Others have indicated that horses see blue and may be able to distinguish between a color and gray of equal brightness. However, most conclude that horses do not perceive color.

Binocular Vision

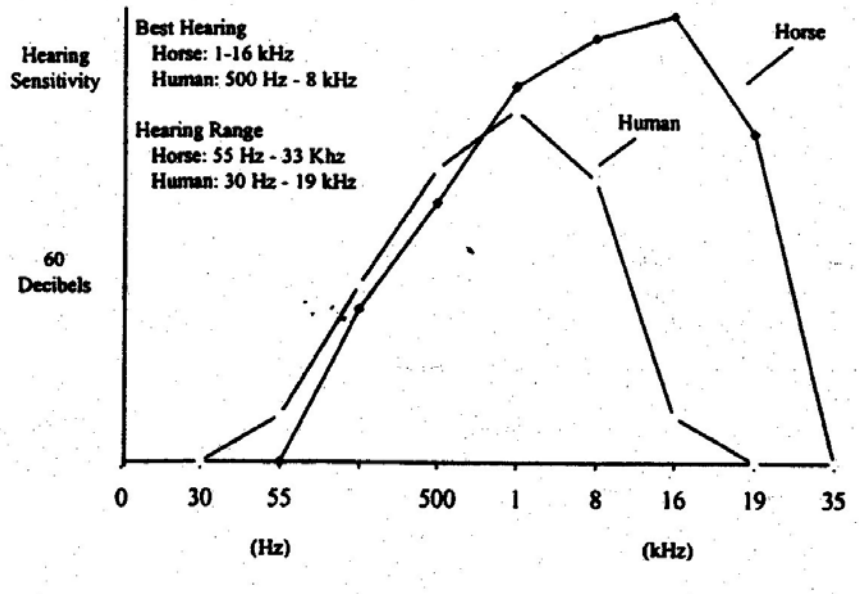
'The horse sees with binocular vision when it uses both eyes to observe an object. The horse's binocular vision, however, is not as good as its monocular vision. Some horses have better binocular vision because their eyes are set closer together. Horses often have to learn to use binocular vision through training. Examples are when teaching a rope horse to follow cattle at the correct distance, teaching a barrel horse to judge the distance to a barrel in order to make a turn, or teaching a hunter or jumper the correct approach to a fence.

Olfaction

There is not much known about the horse's sense of smell. However, it is generally agreed that it is somewhat well- developed. Horses have apparently learned to associate certain odors with specific conditions considered to be friendly or life threatening. Horses use smell to locate feed and to identify each other as well as humans. They are frequently able to associate a medicinal smell with veterinarians and their function. When certain odors are associated with unpleasant or threatening conditions, horses may become nervous and difficult to control.

Hearing

Horses have a well-developed sense of hearing. In most situations sounds that are audible to people are also heard by horses. However, some differences do exist. The horse is capable of hearing sounds at frequencies above those perceived by humans. Whereas the human is able to hear sounds at lower frequencies than the horse (Figure 2).



Although horses can hear sounds of a higher frequency than humans, they are less sensitive to these higher frequencies than other mammals.

There are ten muscles controlling each ear of the horse so they can turn their ears in almost any direction. 'Mere is also good coordination between eye and ear movement as the horse directs its attention toward an object. The horse has good ability to localize the source of sound. However, when a horse hem sounds, it knows the general direction but may not always detect its precise location. This is why a horse may be somewhat flighty or startled at first sounds.

Your horse may not hear you talking if your voice is at a very low frequency. Also, the horse may spook at a high frequency that you cannot hear. Many noises can be particularly irritating or frightening to the horse and can interfere with their ability to respond to the handler or to function in given situation. Horses can overcome the fear of noise phobias if they are gradually conditioned to them over time.

Horses respond to particular sounds in specific ways. The tone of voice used around the horse tells it a great deal. Some words have harsh tones while others can have soothing or canning affects. 'Me tone and inflection of your voice can be an important aid in the control of the horse.

Touch

The nervous system is a rather complicated control mechanism that allows the horse to perceive and immediately respond to conditions of its environment. Be horse is a very sensitive animal with exceptional tactile perception. This fact coupled with its learning ability have provided for its domestication and use by man. The superior athletic ability of the horse together with its willingness and desire to please make it a desirable animal for many uses. The horse's low tolerance for pain, sensitivity to pressure and touch, and its excellent memory make it a desirable companion animal.

The horse has a well-developed sense of touch. Consequently, touch is the horse's most important sense for responding to the aids or cues of the rider or handier. The most sensitive areas are around the eyes, ears, and nose. Other sensitive areas to touch are the withers, ribs, flanks, and legs of the horse. Young horses or those that have not been handled extensively are fearful of anything touching or holding their legs.

Touch is an important sense when riding the horse. Horses will respond to the rider's hands through the touch of the bit on its mouth and the touch of the rider's legs an its side. It is important that these two areas remain sensitive through a careful, consistent and considerate use of the hands and legs of the rider. A rider who continuously kicks the sides and pulls on the mouth will cause the horse to become unresponsive to these riding aids.

The back and withers are also very sensitive areas on the horse. The horse is extremely sensitive to the body weight of the rider and will readily respond to shifts in the body position of the rider. Changes in body position in harmony with use of the hands and legs can cause the horse to move forward, stop, or turn. Exaggerated changes in body position can cause the horse to go off balance or become confused.

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