



How Horses See and Hear

Teaching Notes for Powerpoint slides

SLIDE #2 WHAT DO HORSES SEE AND WHAT DO HORSES HEAR?

It is important to know what a horse can see and hear and what he can't. It is also useful to understand how a horse's vision and hearing differs from our own. Having an understanding of horse vision and hearing will provide you with insight on why a horse might behave a certain way.

- Can he see you approaching?
- Can he see the horse or vehicle beside him?
- What does he see as he is approaching a horse trailer?
- Why does he seem nervous when it is windy?

SLIDE #3 & 4 HOW HORSES SEE

Horses have large complex eyes that can see the horizon and the ground at the same time. Because of this, they don't see clearly at a distance. They see movements and shapes better than specific details. They are "near-sighted" and their depth perception is not very strong. Rule of Thumb: Eyes on the side of the head = prey; eyes on the front of the head = predators.

Having eyes set back from his nose means he can't see directly in front of himself; he can't see his nose and mouth. You can probably see your nose but not your mouth. Horses' eating habits dictate that their heads be at ground level most of the day. Therefore, they need to see the grass they are eating and scan the horizon for predators at the same time. Their range of vision is about 300 degrees, except for an area of about three feet directly in front of and six feet behind them.

Horses have both monocular and binocular vision. When a horse looks to either side, each eye moves and sees independently. This results in lack of depth perception. When a horse looks straight ahead, both fields of vision overlap and his vision becomes

binocular, just like humans, and he gains some depth perception. In order to bring objects into focus, the horse will move his head up or down.

Horses have a complex eye to brain structure. Each eye feeds into one side of the brain with limited crossover, and the pictures the eye receives are not as sharp as are ours. This is an important factor in the training process. This means that while you may cause no reaction when working on one side of a horse, you may cause a reaction on the other. Horses, with their monocular/binocular vision, may also see objects larger than they really are. You may appear to be ten feet tall to a horse!

Horses have much better night vision than we do. This is possible because of the tapetum, a highly reflective area in the back of the eye. This is what you see when you shine a light into a horse's eyes at night; it is reflected back as a green glow.

Most animals, other than birds and primates, see just two colors (blue and green). The colors these animals see best are yellowish green and bluish purple. Therefore, yellow is a high-contrast color for almost all animals. This may be why animals react strongly to yellow turnouts and machinery.

According to Temple Grandin in "Animals in Translation", horses see the way they do because of the difference in the shapes in our eyes. Human retinas have a "fovea" (*foe-vee-a*), a round spot in the back of the eye where they get their best vision. Domestic animals -- and fast animals who live on the open plains -- have a "visual streak" instead of a fovea. The visual streak is a straight line across the back of the retina. Most experts think the streak helps animals scan the horizon.

Many animals see more intense contrasts of light and dark because their night vision is so much better than ours. Good night vision involves excellent vision for contrasts and relatively poor color vision.

Animals' sharper contrast seems to make dark spots appear to be deeper than lighter spots; the reason cattle guards work.

In "An Anthropologist on Mars", Oliver Sacks told about an artist who lost his color vision. It became very difficult for him to drive because tree shadows on the road looked like pits his car could fall into. Without color vision, he saw contrasts between light and dark as contrasts in depth.

SLIDE #5**EAR DIRECTIONS**

The horse's hearing is much more acute than our own. He has large, mobile ears, operated by ten muscles (humans have three; cats have 32), which can rotate fully, and can pick up sounds from all directions. They operate in conjunction with the eyes. In other words, when an ear is pointed forward, its corresponding eye is also pointed forward. Tradition says that the closer together the set of the ears; the better the forward vision.

The ears are one of the best indicators of a horse's mood, giving crystal clear messages because they are so mobile. They can be rotated almost 180 degrees and move independent of each other. Ears that are actively moving in all directions indicate a horse that is attentive to all around him. Ears that are almost flaccid belong to a relaxed horse. The ears are held forward when the horse is interested, pricked rigidly forward for anxiety, twisted toward sounds to listen, and laid back tightly against the top of the neck to show displeasure or aggression. If his ears are laid back against his head, use extreme caution working around him until he's calmed down

SLIDE #6**EARS GIVE YOU CLUES**

Horses have large ears that can twist almost all the way around. The ears will tell you the direction of the horse's attention. They can listen to two directions at the same time. Their hearing is very sensitive.

Like other prey animals, the horse's ability to pinpoint sound is not very precise. He knows the general direction of a sound; enough to know which way to run!

His hearing range is greater than ours: 55 to 33,500 hertz as compared to 30 to 19,000 hertz (cycles per second) in humans. His bottom range is higher than ours which means he may not hear you talking if your voice is pitched very low, and his top range is higher as well: he may spook at an unfamiliar sound which you can't hear.

SLIDE #7**WHO'S LISTENING HERE?**

The picture shows more than just ear direction. It also shows body language. The horse at the back is not relaxed; he's listening with his whole body to the horse in the front. The horse in front is listening to the horse behind and to the camera.

SLIDE #8**THE NOSE KNOWS**

Horses have a highly developed sense of smell, and they use it to identify objects in their surroundings. Allow the horse to smell your hand, your equipment, whatever is causing him to be anxious.

Horses are “obligate nose breathers”. This means they cannot breathe through their mouths like humans can. Be sure you do not cover your horse’s nose – either with a blanket or your hands – and do not adjust his halter or bridle too low on his face.

GOOD VIBRATIONS

Horses have a highly developed sense of touch. It is their primary method of communication with each other and with humans. Knowledge of this is very useful in our interactions with horses. We use leg pressures to communicate our requests for direction and speed changes when we are riding; we use grooming to bond our relationship with our horse.

In fact, touch and sound are much more important than sight to a horse. On encountering a strange object, a horse will accept it more easily if allowed to touch it with nose or foot and will be quicker to accept if you reassure him with your voice and hands. Horses show affection by touching, nuzzling and grooming each other (and you!).

AND THINGS THAT GO BUMP IN THE NIGHT

Horses also have a highly developed sixth sense. This ESP, perception or psychic ability is well documented. It includes a pronounced homing instinct, the ability to sense impending danger, sensitivity to moods of others, and even the reluctance to pass reputedly haunted places! Horses have incredibly positive energy which is understood and absorbed by our own bodies. They are "feel good" animals.

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