



The Eyes Have It: Some Basic Information on the Equine Eye

By Dr. Alex Urban

The general anatomy of the equine eye is similar to other mammals, including humans. Eyelids with horizontal lashes close over the cornea, or surface of the eye. The white, sometimes pigmented, portion of the eye surface just beside the cornea is the sclera. There is a third eyelid at the inside corner of each eye that acts as a “windshield wiper” to distribute tears across the eye surface. Deep to the cornea is the iris, varying from dark brown to blue, with its central black opening called the pupil. Corpora nigra, irregular edges of the iris particularly on the upper rim, act as sun shades to the back of the eye; these are unique to horses. Just behind the pupil is a clear lens that acts to focus on objects close to the animal. As the animal ages, this may become cloudy (cataract type change). Horses are less able to focus on close objects because the lens has limited ability to change shape. At the back of the eye behind the lens is the retina, including the tapetum. This extremely complex structure converts light energy into electrical energy that is transported by the optic nerve to the brain. These events result in vision.

The tapetum is a reflective portion of the retina that is responsible for the “glowing” eyes seen at night; it ranges from blue to green to red/pink depending on horse coat and eye color. This adaptation improves night vision. Also within the retina are two types of cells that are sensitive to different types of light: rod and cone photoreceptors. Rods are more sensitive to dim light and motion, while cones are more sensitive to bright light and provide color vision. Because rods outnumber cones by nearly 9 times, horses are very good at escaping potential predators at night. Based on current research, our equine friends are able to see blue, yellow, and green, but red may appear to have a more green color than humans perceive. Extreme lateral (side) placement of the eyes within the skull allows the horse a 350 degree field of vision, with very narrow blind spots directly in front of and behind the animal. This is why it is wise to never approach from either extreme.

Tears drain from the eye via the nasolacrimal duct, which runs from the inner corner of each eye through the skull to an opening at the bottom of each nostril. If this duct is clogged or is damaged in some way, the horse will have excess tears and buildup of discharge at its inner eye corners with no signs of pain. A clogged duct can be cleared in the field with a simple irrigation. Signs of an eye issue other than increased tearing include: squinting, swelling of the lids, increased or thickened discharge, redness of the sclera or behind the cornea, upper eyelashes turned downward, and the appearance of eyes sinking into, or protruding from, the skull more than usual.

A multitude of equine eye diseases exist, some of which produce the above signs. In Central Florida, foreign bodies, corneal ulcers, uveitis, and abnormal growths are very common. A foreign body refers to any object that is not a normal part of the ocular anatomy, such as grass, sand particles, sticks, etc. Occasionally, these foreign bodies can irritate and damage the cornea leading to a corneal ulcer. A corneal ulcer is a defect of one or several layers of the cornea. An ulcer that is extremely deep (down to a single layer of corneal cells) runs the risk of eye rupture. Inflammation within the eye is termed uveitis. This inflammation may be caused by ocular infection or trauma (such as a penetrating foreign body), systemic infection (such as Leptospirosis or herpes-virus), and/or genetic predisposition (as in Appaloosas).

Many ocular tumors occur, though some are more common than others. Squamous cell carcinoma is a cancer often seen around equine eyes with pink skin which has minimal melanin (pigment) to protect against the sun’s rays. Sarcoids are seen in all colors and breeds; the cause of this neoplasia is still being researched, though many believe it is caused by a virus. Summer sores, or habronemiasis, around the eye or involving the third eyelid are caused by fly larvae. The body tries to rid itself of the parasites, leading to inflammation and gritty yellow granules within the inflamed tissue.

At Brandon Equine Medical Center, we offer hospital appointments with our board-certified ophthalmologist Dr. Tammy Miller Michau, as well as farm calls with our team of ambulatory veterinarians. If you would like to make an eye-related appointment for your horse with Dr. Miller, Dr. Urban, or any member of the team, please call 813-643-7177.

Contact Brandon Equine Medical Center at 813-643-7177 or email info@brandonequine.com with any questions regarding this topic.

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