

Eye spy

Vet **Linda Belton** considers how the world looks from your horse's point of view, and offers advice on how to treat common eye problems



Most of us will have wondered at some point exactly what a horse can see – especially when we're having a battle to get them past a particularly scary piece of grass when out for a hack!

Certainly for reliable detection of any predators, the eyes need to be positioned to the sides of the head and relatively far back on the skull. It is the need for this very wide field of vision, coupled with teeth suitable for eating large amounts of fibre, that has determined the shape of the horse's head.

When a horse's head is pointing forwards, he has a visual field of nearly 350 degrees in total, with only a small blind spot near his tail. Thus the horse has a wide and complete panoramic view of his surroundings.

His binocular field of vision – the area in which both eyes see simultaneously – is limited to a 65 to 70 degree arc in front of

him. A binocular visual field is better for depth perception, but the horse can use other visual clues for depth perception and therefore judge distances in the areas of vision where only one eye can see.

Attention to detail

Visual acuity in the horse – which means the detail with which he can see – is actually quite high. To measure acuity, the smallest stimulus that produces a tracking response in the eye is measured.

A horse viewing an object at 20ft has approximately the visual acuity of a person viewing the same object at 33ft. The horse has a visual acuity of approximately 1.5 times that of a dog and three times that of a cat. This improves when objects are more than 70cm above ground level.

A horse's colour vision is also the subject of much debate. Some eye specialists believe that the horse has the ability to

detect the colours red and blue but not yellow and green, while others think red is poorly differentiated but the yellow, green and blue range can be detected.

Horses have other special adaptations in their eyes especially to aid night vision, again important for escaping predators rather than jumping fences – although this is possibly relevant when jumping into woods or areas of low light.

Vision testing

Testing a horse's vision can be difficult. Examining the eye with an ophthalmoscope can detect any abnormalities or diseases. However, the next step is to assess what impact any abnormalities found have on the horse's actual vision.

Vision testing must be carried out without the use of any sedative drugs, and horses that are upset or tricky to handle will make the process difficult.



Examining the eye with an ophthalmoscope can help reveal any abnormalities.

Vision tests must always be performed without contact with a handler or another horse, and in unfamiliar surroundings. Horses on a short lead in a familiar environment, or foals in contact with their dam, may not reveal any visual difficulty that is present.

Obstacle testing or maze testing is very useful. Various obstacles can be placed in a school that the horse is then required to step over, pass between or avoid.

The obstacles can easily be changed during the test to avoid any risk of the surroundings becoming familiar. Each eye is blindfolded in turn to assess the vision in each independently, then the vision is tested without a blindfold. Obstacles should be a variety of colours and, if possible, a maze test carried out in light and dark conditions.

Horses with normal vision should inspect and then avoid the obstacles. Horses with visual impairment may be unaware of the obstacles, and trip over or bump into them. The assessment of the horse's response is obviously subjective, but maze testing is probably the single most useful test of a horse's vision.

Diseases of the eye

Uveitis

This is an inflammatory condition of the eye that is particularly common in horses. Uveitis should be regarded as a veterinary emergency, as it is not only very painful for the horse but, if left untreated, can cause permanent damage.

Uveitis is not a single disease entity, but a term to describe a set of diseases affecting parts of the eye. The underlying cause is variable and may not be possible to identify. Infections (bacterial, viral or

parasitic), chemical reactions, tumours or trauma can all cause uveitis. Affected horses are often sensitive to light, have a discharge from the eye, hold the eye shut and may appear depressed due to the pain. If you have a horse with one eye held closed, take the problem seriously straight away and seek veterinary advice.

The changes occurring in a uveitic eye can result in adhesions forming within the eye that stop the pupil responding to light and this can result in a loss of vision in the affected eye. Uveitis can become recurrent, which is often termed colloquially as moon blindness, and it recurs spontaneously.

To try and minimise the risk of uveitis becoming recurrent, treatment needs to be aggressive and prolonged, and medication needs to be given topically to the eye as well as orally. Treatment is aimed at forcibly dilating the pupil with the use of eye drops and reducing inflammation. Corticosteroids are the treatment of choice and are given

in drop form directly into the eye, orally to the horse and medication can be injected into the conjunctiva. However, in some cases of uveitis there may also be damage to the surface of the cornea and the use of corticosteroids is then limited.

As uveitis is a painful condition, many horses are uncooperative about having drops placed in the eye. To be effective, drops need to be given multiple times a day. To make this practical, an ocular lavage kit (see page 98) may be inserted into the eye.

Uveitis is one of the most common causes of blindness in horses and it can affect one or both eyes. Some recurrent cases cannot be controlled. In such cases, if the other eye is normal, the affected eye may be removed, especially if vision is already compromised in that eye.

Tumours

The two most common tumours affecting the eye are sarcoids and squamous cell carcinomas (SCC). The SCC is the most common and usually affects the third eyelid, which is the small pink triangle just visible in the inside corner of a horse's eye.

Early signs of an SCC include a persistent discharge from the eye, which is initially clear but may become slightly bloodstained. The third eyelid becomes thickened and over time a pink cauliflower-like growth may appear on the third eyelid. The cause of an SCC may relate to ultraviolet radiation and thus a lack of pigment around the eye may be a contributory factor.

Treatment of an SCC involves removal of the entire third eyelid. The earlier this condition is diagnosed, the more successful this is likely to be, but this is a tumour that does have a tendency to local recurrence.



Inflammation is one of the symptoms of uveitis.

Eye removal

The surgical removal of the entire eye, leaving an empty socket covered with normal skin and hair, is known as eye enucleation. Removal of the eye may be necessary in cases of ocular tumours, severe trauma to the eye, or recurrent uveitis. The surgery is carried out under general anaesthetic and the recovery time post op is relatively short.

The skin over an enucleated socket gradually becomes concave and some owners may find the cosmetic appearance unacceptable. In some cases, it is possible to use an intraorbital prosthesis to improve the appearance after removal. There are many different implants available, such as silicone, and the failure rate is less than 10 per cent, provided the right cases are selected.

One-eyed horses cope well with ordinary life and there are relatively

well-known one-eyed horses that have competed to quite high levels in various disciplines, such as Briarlands Blackberry, who evented to four-star level.

One-eyed horses do have the ability to judge depth and distance and thus can jump reasonably safely, but some disciplines exclude one-eyed horses from competing on the grounds of safety to both horse and rider. An example is polo – where a reduced visual field increases the risk to the horse of being hit by the ball, and injury to the good eye could be catastrophic. There is a well-known saying that there is nothing wrong with a one-eyed horse until something goes wrong with the remaining eye!

Care must be taken when riding a one-eyed horse on the road, especially if he is blind in his right eye. Such horses may be more likely to shy in front of a car approaching from behind that they are unaware of.



One-eyed Briarlands Blackberry in action.

Sarcoids are a skin tumour found in a number of different areas on the body. When they affect the eyelids or the area around the eye, they can be extremely problematic. Their appearance varies from a nodular lump, to an area of bald skin, to an area of roughened skin. Treatment is difficult and expensive, involving either the use of immunotherapy with BCG (TB) vaccine or the use of radiation, where iridium wires are implanted into the sarcoid.

Cataracts

A cataract is an opacity of the lens. Different parts of the lens can be affected, and to different extents. The transparency of the lens depends upon its relatively dehydrated state, the precise arrangement of the lens fibres and the solubility of the lens proteins.

The lens capsule must be smooth and uniform. Any injury to the lens or capsule can result in metabolic changes within the lens and a reduction in its transparency.

Cataracts can be congenital (present at birth) although there is often a delay in recognising them. Juvenile cataracts appear up to three years old, adult cataracts at three to 20 years and senile cataracts at over 20. Hereditary or congenital cataracts occur due to abnormal development of lens fibres.

In cases of acquired cataracts, where the lens has developed normally but a cataract occurs due to some extrinsic cause, the exact reason may be difficult to determine. It may be due to metabolic changes within the lens or secondary to some other ocular disease. Senile cataracts are part of the normal ageing process of the lens.

Cataracts may be either stationary or progressive. Sometimes it is not possible on a single examination to be certain whether the cataract is likely to be progressive. They can affect one or both eyes.

There is no medical treatment that will influence the progression or nature of a cataract. Some cases are suitable for surgical removal of the lens to restore vision. However, cases must be carefully selected and the highest success rates are in foals with congenital cataracts.

Corneal ulcers

Erosions on the surface of the cornea can occur for a variety of reasons. Direct trauma to the front of the eye, often when grazing hedgerows, is a common cause. Infection is another cause, or they may occur secondary to some other condition of the eye. Horses with a corneal ulcer will usually have a discharge from the eye and tend to hold the eye closed, especially when you try and examine it!

To check for a corneal ulcer, fluorescein dye is inserted into the horse's eye. It sticks to areas of damage on the cornea, thus highlighting the ulcer. Treatment depends on the underlying cause. All cases must be checked carefully for the presence of a foreign body in the eye, which will obviously require removal for treatment to be successful.



A lavage system makes giving eye drops easier.

Lavage systems

An ocular lavage system is fitted to enable accurate and easy delivery of medication directly onto the eye.

A catheter is inserted through the eyelid. It then runs between the ears and along the crest, finishing about halfway along the neck. At this point, a syringe containing eye drops can be attached and depressed, forcing the drops along the tube to the eye. Thus the drops are effectively delivered onto the eye from a remote point, making the job less stressful for horse and owner!

To fit the lavage system, the horse usually needs to be sedated and a nerve block placed to desensitise the eyelid. The catheter is then sutured in place, with the free end often taped onto the mane allowing for easy access.

Expert file

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