

Stable
Management

VOLUME 34

EXTRA



THROUGH YOUR HORSE'S EYES

Welfare-Friendly
Property Design

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Through Your Horse's Eyes

Maximize equine welfare by designing your equine property from the horse's perspective

Katie Navarra

Chances are your horse property is designed to make chores easier—from feeding to cleaning stalls, turnout and riding, and everything in between. Of course, your barns, paddocks, and arenas also prioritize equine safety and welfare, but did you ever consider its layout from your horse's perspective?

Although most horses adapt quickly to living in “our world,” considering how they naturally see and interact with their surroundings can improve their well-being. For

our horses to be more confident and relaxed in their environment, we must understand equine vision and consider how they perceive the world.

Scientists are studying how horses view the world, and their findings are providing valuable insights into how we can better design barns, turnout arenas, and riding spaces for the sake of the horse. Considering the horse's perspective in a property design can help reduce equine stress levels and likelihood of behaviors such as spooking.

Here are a few opportunities to embrace “horse-centric” thinking as you prepare to build or renovate your horse property.

Home Base

Regardless of how frequently you travel—locally, nationally, or internationally—you have a place where you return to and feel most comfortable. For people, a home base is a physical location; horses, as herd animals, operate differently.

“Their home base is the herd. For a

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(firocoxib)

Legend
(hyaluronate sodium)

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(hyaluronate sodium)

Surpass®
(1% diclofenac sodium)

EQUIOXX IMPORTANT SAFETY INFORMATION: As a class, non-steroidal anti inflammatory drugs may be associated with gastrointestinal, hepatic and renal toxicity. Use with other NSAIDs, corticosteroids or nephrotoxic medication should be avoided.

LEGEND IMPORTANT SAFETY INFORMATION: The following adverse reactions have been reported following intravenous injection: occasional depression, lethargy, and fever. Following intra-articular injection: lameness, joint effusion, joint or injection site swelling, and joint pain.

HYALOVET and HYVISC IMPORTANT SAFETY INFORMATION: A mild inflammatory response may occur post injection. For intra-articular injection in horses only. Do not use in horses intended for food. Caution: Federal law restricts this drug to use by or on the order of a licensed veterinarian.

SURPASS IMPORTANT SAFETY INFORMATION: SURPASS topical cream is only approved for use in horses and has not been evaluated in breeding, pregnant, or lactating horses, or in horses under 1 year of age. Do not exceed the recommended dose.

Brief Summary: This information is not comprehensive. Before using Equioxx® (firocoxib) tablets, please consult product insert for full prescribing information. The product insert may be obtained from your veterinarian or by visiting www.equioxx.com.
CAUTION: Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

Indications: EQUIOXX Tablets are administered once daily for up to 14 days for the control of pain and inflammation associated with osteoarthritis in horses.

Dosage and Administration: Always provide the Client Information Sheet with the prescription. The recommended dosage of EQUIOXX Tablets is one 57 mg tablet administered orally to horses weighing 800–1500 lbs, once daily for up to 14 days. For ease of administration, EQUIOXX Tablets may be given with food.
The overall duration of treatment with any firocoxib formulation in horses, including EQUIOXX Tablets, Injection or Oral Paste, should not exceed 14 days. Please see the package insert for EQUIOXX Injection or Oral Paste for appropriate prescribing information for those formulations.

Contraindications: Horses with a hypersensitivity to firocoxib should not receive EQUIOXX Tablets.

Warnings: For use in horses only. Do not use in horses intended for human consumption. Store EQUIOXX Tablets out of the reach of dogs and other pets in a secured location in order to prevent accidental ingestion or overdose.

Human Warnings: Not for use in humans. Keep this and all medications out of the reach of children. Consult a physician in case of accidental ingestion by humans.

Precautions: Horses should undergo a thorough history and physical examination before initiation of NSAID therapy. Appropriate laboratory tests should be conducted to establish hematology and serum biochemical baseline data before and periodically during administration of any NSAID. Clients should be advised to observe for signs of potential drug toxicity and be given a Client Information Sheet with each prescription. See Information for Owner or Person Treating Horse section of this package insert.

Treatment with EQUIOXX Tablets should be terminated if signs such as inappetence, colic, abnormal feces, or lethargy are observed. As a class, cyclooxygenase inhibitory NSAIDs may be associated with gastrointestinal, renal, and hepatic toxicity. Sensitivity to drug-associated adverse events varies with the individual patient. Horses that have experienced adverse reactions from one NSAID may experience reactions from another NSAID. Patients at greatest risk for adverse events are those that are dehydrated, on diuretic therapy, or those with existing renal, cardiovascular, and/or hepatic dysfunction. NSAIDs should be avoided in potentially nephrotoxic drugs should be carefully approached or avoided. NSAIDs may inhibit the prostaglandins that maintain normal homeostatic function. Such anti-prostaglandin effects may result in clinically significant disease in patients with underlying or pre-existing disease that has not been previously diagnosed. Since many NSAIDs possess the potential to produce gastrointestinal ulcerations and/or gastrointestinal perforation, concomitant use of EQUIOXX Tablets with other anti-inflammatory drugs, such as NSAIDs or corticosteroids, should be avoided.

The concomitant use of protein bound drugs with EQUIOXX Tablets has not been studied in horses. The influence of concomitant drugs that may inhibit the metabolism of EQUIOXX Tablets has not been evaluated. Drug compatibility should be monitored in patients requiring adjunctive therapy. The safe use of EQUIOXX Tablets in horses less than one year in age, horses used for breeding, or in pregnant or lactating mares has not been evaluated. Consider appropriate washout times when switching from one NSAID to another NSAID or corticosteroid.

Adverse Reactions: The safety and effectiveness of EQUIOXX Tablets was established in a relative bioavailability study, comparing EQUIOXX Tablets and EQUIOXX (firocoxib) Oral Paste. Therefore, additional field studies were not performed to support the effectiveness of EQUIOXX Tablets. In controlled field studies, 127 horses (ages 3 to 27 years) were evaluated for safety when given EQUIOXX Oral Paste at a dose of 0.05 mg/lb (0.1 mg/kg) orally once daily for up to 14 days. The following adverse reactions were observed. Horses may have experienced more than one of the observed adverse reactions during the study.

Adverse Reactions	EQUIOXX n=127	Active Control n=125
Abdominal Pain	0	1
Diarrhea	2	0
Excitation	1	0
Lethargy	0	1
Loose Stool	1	0
Polydipsia	0	1
Urticaria	0	1

In these field trials, EQUIOXX Oral Paste was safely used concomitantly with other therapies, including vaccines, anthelmintics, and antibiotics. The safety data sheet (SDS) contains more detailed occupational safety information. To report suspected adverse events, for technical assistance, or to obtain a copy of the SDS, contact Boehringer Ingelheim Animal Health USA Inc. at 1-888-637-4251. For additional information about EQUIOXX, visit www.fda.gov/reportanimal.

Animal Safety: The safety of EQUIOXX Tablets was supported by a relative bioavailability study comparing EQUIOXX Tablets and EQUIOXX Oral Paste. CLINICAL PHARMACOLOGY: Relative Bioavailability Study, pharmacovigilance information, and target animal safety data for existing firocoxib containing products in horses. No additional target animal safety studies were conducted with EQUIOXX Tablets.

In a target animal safety study conducted to support the approval of EQUIOXX Oral Paste, firocoxib was administered orally to healthy adult horses (two male castrates and four females per group) at 0, 0.1, 0.3 and 0.5 mg firocoxib/kg body weight (1, 3 and 5X the recommended dose) for 30 days. Administration of firocoxib at 0.3 and 0.5 mg/kg body weight was associated with an increased incidence of oral ulcers as compared to the control group but, no oral ulcers were noted with 0.1 mg/kg. There were no other drug-related adverse findings in this study.

In another target animal safety study, firocoxib was administered orally to healthy adult horses (four males or male castrates and four females per group) at 0, 0.1, 0.3 and 0.5 mg firocoxib/kg body weight (1, 3 and 5X the recommended dose) for 42 days. Administration of firocoxib at 0.1, 0.3 and 0.5 mg/kg body weight was associated with delayed healing of pre-existing oral (lip, tongue, gingival) ulcers. In addition, the incidence of oral ulcers was higher in all treated groups as compared to the control group.

Clinical chemistry and coagulation abnormalities were seen in several horses in the 0.5 mg/kg (5X) group. One 5X male horse developed a mildly elevated BUN and creatinine over the course of the study prolonged buccal mucosal bleeding time (BMBT), and a dilated pylorus of the right colon. Another 5X male had a similar mild increase in creatinine during the study but did not have any gross abnormal findings. Of seven females in 5X group had prolonged BMBT, bilateral tubulointerstitial nephropathy and bilateral papillary necrosis.

Tubulointerstitial nephropathy occurred in one 3X female, two 3X male horses, and the 5X female horse discussed above with the prolonged BMBT. Papillary necrosis was present in one 1X male horse and the 5X female horse discussed above. Despite the gross and microscopic findings, all of the horses were clinically healthy and had normal hematology, clinical chemistry and urinalysis values.

In another target animal safety study, firocoxib was administered orally to healthy adult horses (three females, two male castrates and one male per group) at 0, 0.25 mg/kg, 0.75 mg/kg and 1.25 mg/kg (2.5, 7.5 and 12.5X the recommended dose of 0.1 mg/kg) for 32 days. An additional group of three females, two male castrates and one male per group, was dosed at 1.25 mg/kg for 32 days but was monitored until Days 147-149. There were treatment-related adverse events in all treated groups. These consisted of ulcers of the lips, gingiva and tongue and erosions of the skin of the mandible and head. Gross and microscopic lesions of the kidneys consistent with tubulointerstitial nephropathy were seen in all treated groups. Papillary necrosis was seen in the 2.5X and 12.5X groups. In addition, several 12.5X horses had elevated liver enzymes (GGT, SDH, AST and ALT). One 2.5X horse had increased urea and urine protein levels which was due to renal hemorrhage and nephropathy. Gastric ulcers of the margo plicatus and glandular area were more prevalent in the 2.5X and 7.5X groups, but not seen in the 12.5X group. The group of horses that were monitored until Days 147-149 showed partial to full recovery from oral and skin ulcers, but no recovery from tubulointerstitial nephropathy.

Storage Information: Store at room temperature, between 59°–86° F (15°–30° C). Brief periods up to 104° F (40° C) are permitted.

How Supplied: EQUIOXX is available as round, beige to tan, half-scored tablets, containing 57 mg firocoxib. EQUIOXX Tablets are supplied in 60 and 180 count bottles.
1 McCann ME, Rickes EL, Hora DF, Cunningham PK et al. In vitro effects and in vivo efficacy of a novel cyclooxygenase-2 inhibitor in cats with lipopolysaccharide-induced pyrexia. *Am J Vet Res*. 2005 Jul;66(7):1278-84.
2 McCann ME, Anderson DR, Bideau C et al. In vitro activity and in vivo efficacy of a novel COX-2 inhibitor in the horse. *Proceedings of the Academy of Veterinary Internal Medicine*. 2002. Abstract 114, p.185.
3 Data on file Made in France.

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For stalled horses, having a herdmate stalled directly across from them and having the upper part of the stall open to allow them to monitor their surroundings and engage with other horses as they please is the ideal setup.

domestic horse, it is their paddock where there are other horses,” says Candace Burke, MSc, from the Department of Neuroscience in the Canadian Centre for Behavioral Neuroscience at the University of Lethbridge, in Alberta, Canada. “Their behavior is organized to stay with the herd. So, the further you take them away from their herd, the greater the demand for you to read their behavior so that you won’t have an accident.”

In the wild, the herd might roam from one spot to another, so the home base shifts. As Burke points out, in domestic horses, home base becomes a smaller area they live within as part of their herd and, as a result, feel most comfortable—close to their buddies.

“When designing a stable, the most important thing to keep in mind would be that horses are herd animals and, if their home base is in a stall, then just like out in the paddock they want the opportunity to see other horses but have privacy,” Burke says. “Being able to see other horses, like having a horse directly across from them and having the upper part of the stall open to allow them to monitor their surroundings and engage with other horses as they please, is the ideal setup.”

Ideally, we’d build arenas, wash stalls, and other amenities in proximity to what has become the horse’s home base. However, that is not always practical. Property size and layout might place them further from the barn or paddocks.

Plus, performance horses are frequently off-site, where you have no control over the facility’s layout. However, when you understand how horses acclimate to a space away from their home base, you can help them feel comfortable more quickly.

Horses need to sniff, look, and loop to become comfortable in a space away from home base, says Burke. Loops are “exploratory excursions” away from home base to investigate new surroundings.

“We have found that when a horse can move on its own when ridden, it will sniff, look, and loop,” she says. “So, even when ridden, they are still trying to express their innate behavioral organization.”

Instead of rushing to get on your horse and ride, train, or compete, take research-based steps to reduce his anxiety by letting him walk around the venue, look, and sniff, says Burke. This allows horses to exhibit natural exploratory behavior and become more relaxed in new surroundings, she adds.

“Having a riding companion is another great way to reduce a horse’s anxiety when in an unfamiliar place,” she says. “Their herd is their home base, so if your horse has its home base with it, you will have a pleasant ride.”

Inside, Outside, Alone, or in a Group?

Horses are social animals that rely on other horses for safety, comfort, and interaction.



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IMPORTANT SAFETY INFORMATION: As with any prescription medication, prior to use, a veterinarian should perform a physical examination and review the horse's medical history. A veterinarian should advise horse owners to observe for signs of potential drug toxicity. As a class, nonsteroidal anti-inflammatory drugs may be associated with gastrointestinal, hepatic and renal toxicity. Use with other NSAIDs, corticosteroids or nephrotoxic medication should be avoided. EQUIOXX has not been tested in horses less than 1 year of age or in breeding horses, or pregnant or lactating mares.

¹ EQUIOXX product labels and FOI summaries and supplements

² Kvaternik V, Pollmeier M, et al. Pharmacokinetics and metabolism of orally administered firocoxib, a novel second generation coxib in horses. J Vet Pharmacol Ther. 2007;30(3):208-217.

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Your property was probably designed to make chores and horse-keeping easier, but did you ever consider its layout from your horse's perspective?

Managing horses in groups mirrors how they exist naturally—pairing that with 24/7 turnout is often considered the ideal living scenario.

“However, due to many constraints this is not always possible,” Burke says.

For example, not all horses can coexist harmoniously. In these cases, Burke says safety is more important than around-the-clock turnout or group living situations. In this situation, being separate but near the group or being able to see the other horses might be the better option. For stalled horses, she recommends placing a familiar horse in a nearby stall to satisfy their social needs.

Housing horses as a group has an added benefit, says Burke. Usually, a horse will see the herd as home base more than the physical location.

“This gives you more flexibility, as it is easier to move a horse around when it has a friend to tag along,” she says. “Many owners likely have had a situation where they need to take a challenging horse somewhere and have found that bringing their more relaxed herd member first is a great way to do this. That is the moving home base in action. Because they are more comfortable

together, it can really be used to an owner's advantage.”

It's also worth noting that while ample pasture turnout mimics natural horse living scenarios, in some instances it can have an unintended opposite effect. In the 2014 study, *Relative occurrence of stereotypic type behaviours in pastured horses in Australia*, researchers found that pastured horses can develop some of the same stereotypies (repetitive, purposeless behaviors), such as cribbing and weaving, as stalled horses. The study authors suggest this behavior corresponds with caretakers setting regular feeding times and amounts, especially when grass is sparse.

Eye Level

How horses physically see the objects around them is another factor to consider when designing the spaces on your property. Horses see 350 degrees around their body. But what horse owners might not know is how the height and angle of objects in a horse's field of vision might appear. In the 2012 study *Lateral vision in horses: A behavioral investigation*, Evelyn B. Hanggi, MS, PhD, and Jerry F. Ingersoll, of the Equine Research Foundation

in Bend, Oregon, observed that horses could recognize objects from various angles and heights but do appear to have a preference.

The study authors wrote, “It is important to note that there may be a preferred range of stimulus presentation height, which can be used to facilitate cognitive studies. For example, horses may perform better during experiments when they can use a natural head and body posture rather than raise their heads high to view stimuli for prolonged periods.”

In the same study, the authors noted the natural location of food sources for horses is on the ground, given their grazing patterns. Therefore, choosing feeders that account for the horse's downward gaze for eating can optimize their natural vision.

Low-Light Vision

Decades ago, scientists established that horses could see better than humans in the dark. Observations of wild and domestic horses have shown they eat, interact, and wander at night. In the study *Stimulus discrimination by horses under scotopic conditions*, Hanggi and Ingersoll wrote, “Years ago, horses carried soldiers in darkness and,



Horses see better than humans in dim light and can distinguish two-dimensional objects in near darkness. Consider using more natural lighting than artificial on your property.

still today, horses are ridden through the night, often through hazardous topography, in endurance rides (e.g., the Tevis Cup 100 Mile One Day Ride). In such events, horses must be able to perceive rocks, holes, fallen timber, brush, branches, ruts, ravines, and many other potential pitfalls that their riders cannot see in order to avoid injury.”

The pair’s research not only confirmed horses see better than humans in dim light but also provided new data on the quality of equine eyesight in low-light situations. During the experiment, the horses could distinguish two-dimensional objects in near darkness, a feat the researchers could not accomplish.

While horses can see better in the dark than humans, their eyes take longer to adapt from bright light to dark environments and vice versa. Therefore, designing arenas and stable areas to include as much natural lighting as possible can make the adjustment easier on a horse’s eyes.

Give Them Space

Most horses willingly follow their handlers onto trailers, into stalls, and to many confined spaces. While this often happens without a thought or a balk, being in small areas is counterintuitive to natural horse

behavior. Physical size is only a portion of the equation. Clutter quickly shrinks an otherwise large space.

“Horses feel safest when they are in the open,” says Burke. “The more cluttered the wall of an arena and the more dark objects near the walls, the more they will not want to be there. Therefore, having adequate lighting, quieter areas further away from the entry point, and less clutter will likely set you up for the most success. Of course, all horses can be adapted, but most of their memory is for a day. Always be prepared to start over the next day.”

Pastures are another place on the property where you can offer horses more space and areas designed to mimic their natural behaviors. In the wild, horses roam from one location to another and have opportunities to stop and eat or drink along the way. Creating track paddocks on your property can help replicate these experiences.

Track paddocks are expansive corridors that encircle a pasture or property, designed to encourage horses to move freely and exhibit natural behavior. Jaime Jackson popularized these paddocks in his book *Paddock Paradise, A Guide to Natural Horse Boarding*, which emphasizes the importance of allowing horses to move in a way that

mimics their natural instincts in the wild.

Jackson says track paddocks promote physical and mental wellness and can reduce vices and improve hoof health. The paddock typically comprises permanent fencing on the outside and temporary fencing on the inside, although it can be arranged in a variety of ways, such as circling a building or arena or weaving through a trail course, offering nearly limitless possibilities.

Take-Home Message

Horses want three basic things in life: peace, comfort, and food. When experiences meet these criteria, they are often more relaxed and agreeable to work with. For most horses this includes moving easily between their pasture, stall, and arena area on- or off-site. The more we can educate ourselves about natural horse behavior and how they see the world, the more opportunities we have to design properties that are functional and comfortable for horses and humans alike.

“When horses spook, they are only half telling you that they are scared of an object—their real message to you is that they don’t want to be there,” Burke says. “The more pressure you have put on your horse, in a space, the more likely they will find things to spook at.” **SM**