

# HOW TO KEEP YOUR HORSE HYDRATED DURING THE WINTER

WHEN THE TEMPERATURES DROP, MAKE SURE YOUR HORSES ALWAYS HAVE ACCESS TO WATER AND THAT THEY ARE DRINKING ENOUGH.

As we head into an incredibly cold stretch of weather for the start of winter, there has been much discussion on how to prepare horses. Increasing forage intake to help keep core body temperature warm while it ferments in the digestive tract is incredibly important. Also consider providing blankets and shelter, depending on your horse's hair coat.

One factor we cannot overlook, however, is keeping horses hydrated. Most equine nutritionists consider water to be the most important nutrient because of the various functions it performs. These include regulating body temperature, digestion, absorption, and utilization of nutrients, moving feedstuffs through the digestive tract from mouth to rectum, and removing waste products.

On average, the adult horse drinks approximately 1 gallon per 100 pounds of body weight; therefore, the average 1,000-pound horse needs about 10 gallons of water a day. It is very important to make sure horses are consuming enough water, especially when their diets are high in dry feed content, such as hay, to help ensure the feed is moving through the digestive system. If horses do not consume an adequate amount of water, they may become dehydrated quickly, could go off their feed, and might suffer from impaction colic.

Many horses decrease their water intake below required amounts in extremely cold weather for a variety of reasons, such as not wanting or

being able to walk to a water source, water being too cold to drink (preferred water temperature is between 45 and 65 degrees F for most horses), or water being frozen.

Horse owners and managers can do several things to ensure their horses do not become dehydrated:

- If a drop in temperature is predicted, make sure water is freely available before the temperature change, so horses are properly hydrated before the cold weather hits.
- If hot water is not available in the barn, get insulated water jugs and bring it from the house. Invest in heated water buckets or a water heater. Make sure these are grounded, and routinely check to make sure they are working properly. A horse that gets shocked when he tries to drink will be conditioned to not drink!
- Break ice if it forms on the water source and remove the chunks of ice. Although horses can break through thin ice, it can deter them from drinking. "Frost-free" type waterers can be helpful, but even these can freeze if horses are not drinking often enough. Check water sources for ice at least twice a day and more often in colder conditions.
- Monitor your horse's hydration status daily. If you do not know how, ask your veterinarian or another experienced horse person to train you in doing skin pinch tests and evaluating mucous membranes.
- Soaking feeds can be a way to get additional water into your horse. For example, beet pulp is a feed that can hold a good amount of water, and most horses are willing to

eat it. Chopped hays also absorb water and are usually willingly consumed by horses. Ideally, soak these dry feeds in warm water for about 15 minutes before offering them to the horse.



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#### **TAKE-HOME MESSAGE**

When the temperatures drop, make sure water is accessible at all times, and that horses are drinking enough. It is crucial to have water available at mealtimes, especially when feeding dry feeds; researchers have shown that horses drink the most water within three hours of consuming a meal. Finally, carefully monitor both water intake and hydration status daily, especially during extreme or rapid changes in the weather.

The Horse

## WHAT RESEARCH IS SAYING ABOUT SUPPLEMENTS FOR HORSES

## SCIENTISTS ARE STUDYING THE SAFETY, EFFICACY, MECHANISMS OF ACTION, AND PHARMACOKINETICS OF EQUINE NUTRITIONAL SUPPLEMENTS.

Every year equine nutritional supplements continue to increase in popularity. Verified Market Research reported that the global nutritional supplement market for horses was valued at \$73.61 million in 2018. The data used to generate that report projected a steady increase in supplement sales, potentially reaching \$96.18 million by 2026.

As we've reported in previous years, science continues to lag behind the popularity of nutritional supplements ... but not for want of trying.

"While the amount of scientific information on veterinary pet supplements and nutraceuticals is increasing, there remains a paucity of quality control, safety, and efficacy data for the majority of both the substances marketed in pet supplements and the resulting products for purchase currently available," Carrie J. Finno, DVM, PhD, Dipl. ACVIM, of the University of California, Davis, (UC Davis) School of Veterinary Medicine, wrote in a 2020 edition of Nutrition Today. "Despite this lack of evidence, the use of veterinary supplements and nutraceuticals continues to increase."

Rest assured the importance of research in this field is not falling on deaf ears. Veterinary science teams are generating data on the safety, efficacy, mechanisms of action, and pharmacokinetics of various nutritional supplements. A PubMed search shows that within the past year or so, the bulk of equine nutritional supplement research focused on cannabidiol (CBD), followed by omega-3 supplements, gastrointestinal products, and antioxidants.

In this article we'll provide a brief rundown of [some] of the data from those studies, as well as information on maximizing equine safety when offering supplements.

#### **OMEGA-3 FATTY ACIDS**

Omega-3 fatty acids can modulate the inflammatory response in tissues. "Fish oil or algae-derived supplements containing the omega-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) have become increasingly popular," says Undine Christmann, DVM, MSc, MPH, PhD, Dipl. ACVIM, professor of equine internal medicine at Lincoln Memorial University College of Veterinary Medicine, in Harrogate, Tennessee. "To date, studies have explored the effect of these supplements on general behavior, performance, skin, asthma, joint disease, metabolic syndrome, tying-up, various reproductive parameters, and even learning ability in young horses."

Data on omega-3 fatty acid pharmacokinetics are lagging behind their popularity. Addressing the need for basic science, Pearson et al. (2022) offered 50 study horses, split into two groups, low doses (7.5 g or 15 g) of a marine-derived omega-3 supplement containing 1.11 g of EPA and 0.69 g of DHA and 2.22 g of EPA and 1.38 g of DHA, respectively, for 12 weeks. The team's goal was to ascertain if this level of supplementation could

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alter the fatty acid profile in a horse's bloodstream. They noted a significant increase in all omega-3 fatty acids, including EPA and DHA, in the horses' blood at six and 12 weeks of supplementation. Horses supplemented with the 15-g dose had a significantly higher level of omega-3s in circulation than horses receiving the 7.5-g dose.

"The study showed that administration of low doses of DHA and EPA resulted in a dose-dependent increase in omega-3s in the blood of horses," Christmann says.

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Pearson et al. reported circulating levels of omega-6 fatty acids decreased significantly after six weeks of supplementation.

"This further increases the omega-3 to omega-6 ratio, shifting it away from a pro-inflammatory state," says Christmann. In a 2021 study she and colleagues demonstrated that orally administered EPA and DHA were incorporated into glycerophospholipids (GPLs), which are the body's reservoirs for those fatty acids. In turn, EPA and DHA are precursors for oxylipins, which are anti-inflammatory mediators.

"Our goal was to look at the potential of DHA and EPA supplementation to increase oxylipin precursor pools in the joints and lungs of horses, because osteoarthritis and asthma are frequent issues in horses," Christmann says.

Her team divided 20 study horses into two groups: The treatment group received 8.82 g EPA and 5.35 g DHA once daily for 90 days, and control horses received the same diet without supplementation. The researchers collected plasma, synovial fluid, and surfactant (lung fluid collected on bronchoalveolar wash) from all horses at baseline and Days 30, 60, and 90.

"We found that omega-3 supplementation led to increases of key omega-3 fatty acids (EPA, DHA, and docosapentaenoic acid) contained in GPLs in the joints (synovial fluid) and lungs (surfactant) of horses," Christmann says. "Peak incorporation of these fatty acids in GPLs was reached after 60 days of supplementation."

"Horses with osteoarthritis or asthma potentially benefit from increased GPL storage pools that can produce inflammation-resolving lipids," she adds.

Finally, Rizzo de Medeiros Ferreira et al. studied omega-3 fatty acids in the reproductive arena. Their team reported improved uterine involution after supplementing the diets of pregnant mares starting 90 days prior to their expected foaling date until seven days after their first ovulation. The researchers administered a DHA-rich microalgae product once daily at 0.06 g/kg body weight. The product contained 16.12 g DHA per 100 g of product. Assuming a horse weighs 550 kg (1,200 pounds), this means an average dose of DHA was approximately 5 g.

The sooner a uterus involutes postpartum, the more successful breeders might be at achieving a pregnancy at the time of foal heat, and the better the mare's odds of early conception, Christmann explains.

#### GASTROINTESTINAL SUPPLEMENTS

#### Antiulcer products

Equine gastric ulcer syndrome (EGUS), which includes disease of both the squamous (upper) and glandular (lower) regions of the stomach due to gastric acid, is prominent and believed to contribute to poor performance, recurrent colic, weight loss, and behavior changes.

Medications typically help resolve equine squamous gastric disease (ESGD), but without implementing and maintaining management changes, ulcers in the squamous region tend to recur. The rate of EGUS is high, particularly among performance horses, making gastroprotectants popular.

Andrews et al. (2022) evaluated a nutritional supplement containing curcumin. While the research team's primary goal was to determine if curcumin improved lameness, presumably due to the herb's anti-inflammatory properties, their secondary goal was to evaluate its effects on gastric ulcer scores.

In the study, 10 Thoroughbreds received a supplement containing 1,050 mg curcumin extract, as well as Yucca schidigera, vitamin B12, methylsulfonylmethane (MSM), and Boswellia extract, or a control diet for 31 days. By Day 14 of supplementation, curcumin and its metabolite were measurable in 90% of the horses, demonstrating it is absorbed after oral administration.

Most of the horses had gastric ulcers at the start of the study. Gastric ulcer scores decreased in both the treatment and control groups by Day 31, showing that the curcumin supplement did not worsen gastric ulceration, and new ulcers did not form. The study authors were surprised that even the control group had reduced ulcer scores, considering stall confinement is a known risk factor. They suggested the horses had a high plane of nutrition compared to their diet on pasture prior to the start of the study, as well as less competition for feed.

One other study evaluating a nutritional supplement for EGUS found that a combination of pectin, soy lecithin, zinc oxide, and Castanea sativa "promoted healing of mild ESGD in endurance horses."

In that study Lo Feudo et al. (2021) randomly divided 15 endurance horses diagnosed with squamous gastric ulcers into a treatment and control group. Treated horses received the supplement for 30 days, and both groups underwent recommended management changes typical for horses diagnosed with ESGD (e.g., increased pasture turnout, access

to good-quality hay, and reduced intake of nonstructural carbohydrates). Only the treatment group experienced a significant decrease in ulcer score, prompting the authors to conclude the supplement "was effective at promoting healing of mild ESGD in endurance horses."

Mechanisms thought to contribute to the improvement in ulcer scores included:

- Pectins form a gel when exposed to the gastric juice, which protects the stomach lining.
- This gel might also stabilize mucus, increase buffering capacity, and increase gastric pH to make it less acidic.
- Lecithin forms a protective layer that reinforces the acid-repelling properties of the squamous stomach lining.
- Zinc oxide and C. sativa Mill. might exert antioxidant properties that protect the stomach lining against damaging free radicals.

#### **PROBIOTICS**

Probiotics, prebiotics, and post- and parabiotics are popular products to support gastrointestinal health, the intestinal microbiome in particular.

"High-grain diets, abrupt changes in feed, administering medications, especially antibiotics, may all contribute to dysbiosis—an imbalance in the microbial population of the microbiome," says C. Giselle Cooke, MB, BS, PhD (cand.), of the School of Medical Sciences at the University of Sydney, Australia. "In turn, dysbiosis can result in colic, colitis, behavior changes, laminitis/tissue inflammation, and immune dysfunction.

"Dysbiosis produces metabolic byproducts which can be noxious or even toxic, such as those that cause intestinal colic," she adds.

Cooke's team recently published a comprehensive review of studies evaluating the safety, tolerability, and efficacy of probiotic products from 1954 to 2020. After identifying and assessing 18 studies, here's what they found:

- The most common bacteria in probiotic supplements were Lactobacillus, Bifidobacteria, Enterococcus, Streptococcus, and Bacillus.
- Products containing only a single probiotic species appear less efficacious than multispecies formulations.
- Probiotic bacteria did not improve digestibility of either starches or fibers and did not provide a clear benefit in managing colic or preventing salmonellosis.

"In fact, our conclusion was that there were unclear and conflicting results associated with probiotic bacteria use for gastrointestinal conditions," says Cooke. "This could be because bacteria species are ones commonly used for human consumption. In other words, the currently available commercial probiotic formulations do not contain equine-specific species but, rather, appear to have appropriated human probiotic species without good evidence for any repurposed benefit."

In addition, "Neither single nor multispecies probiotic supplementation has been shown to be efficacious in treating equine salmonellosis," she says.

Two positive findings Cooke mentioned were that probiotics improved athletic fitness and stamina and reduced grain-induced hindgut acidosis.

#### **BALANCING EFFICACY WITH SAFETY AND QUALITY CONCERNS**

In an Irish industry survey by Murray et al. (2018), 93% of respondents thought feed supplements had to meet legal standards. Seventy-two percent thought each batch was analyzed for quality, and 92% were under the impression each supplement underwent testing prior to launch.

None of these assumptions are correct. Instead, production of nutritional supplements for animals is largely unregulated, with the exception of the NASC's quality seal program. As a result, our sources say, the market is flooded with poor-quality supplements presumed, but often unproven, to be safe.

#### TAKE-HOME MESSAGE

These are exciting times for owners keen on providing their horses with the best possible diets. With new products continuing to enter the market, safety issues persist, and many questions remain, such as what supplements to give, how much, when, and to which horse.

When recommending products, veterinarians should consider Finno's word of caution: "A veterinarian is legally liable if he or she recommends a pet supplement or nutraceutical product that leads to adverse effects."

The Horse

# REHABBING EQUINE ATHLETES' HOOVES READ ABOUT THE STEPS VETERINARIANS AND FARRIERS TAKE TO IDENTIFY, EVALUATE, AND TREAT RIDING HORSES' HOOF PROBLEMS.

Hoof problems can be time-consuming and tedious—not to mention frustrating—to treat, especially when they're plaguing an equine athlete who's a few weeks from the regional show, preparing to canter down centerline at a year-end competition, or needing the performance of his life to make the national team.

This is where veterinarians and farriers come in to identify, evaluate, and treat hoof and shoeing problems. But even with today's modern technologies and continuously evolving techniques, managing horses' feet is no cakewalk.

#### DON'T DOWNPLAY ROUTINE HOOF CARE

First, let's reemphasize the importance of preventive care, which is important to all facets of your horse's health and soundness—including his feet.

"Proper farriery care from a skilled farrier is essential to keeping your horse working at its top potential for as long as possible," says Lesser.

Researchers have confirmed that in healthy working horses, the long-used four- to six-week interval between trims and shoeings is effective for preventing unbalanced loading and reducing injury risk due to excess loading (Lesniak et al., 2017). Still, it's important to work with your farrier to determine the ideal interval for your horse, as slightly shorter or longer cycles can be beneficial in some cases.

Routine farrier visits can also help your hoof care team identify problems early. One study on the prevalence of hoof issues in a group of nearly 950 horses in the Netherlands revealed that an "unexpectedly high prevalence of hoof disorders was observed during

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regular hoof trimming." While most of the issues—including thrush, hoof wall and quarter cracks, sole bruises, white line disease and widening, and chronic laminitis—were in their mild stages when first noted, left untreated they could develop into more serious problems that could ultimately sideline an equine athlete during treatment.

#### WHEN THINGS GO WRONG

Despite regular hoof care from a skilled and experienced farrier, things can go wrong with your horse's feet.

"When things don't go well, the easy thing to do is look at the foot and start pointing out the imperfections," Reilly says. "And sometimes, that's warranted."

But remember: There's no such thing as a normal or ideal hoof.

"I tend to go back to humans—nobody has perfect conformation," Reilly says, noting the same holds true for horses. "So what are we going to do when things go wrong? And this is where everything falls apart because the real short version is nobody has enough facts (about the equine foot), nobody has enough understanding."

For example, he says, a farrier might recognize he or she needs to "wedge up" a hoof (i.e., apply a shoe with a wedged heel to relieve tension on certain structures), but to what degree? In many cases it comes down to opinion, past experiences, and, ultimately, a little trial and error.

"The problem with horses is nothing stays where you put it," says Reilly. "Over the course of a shoeing cycle, everything is growing. It's like you're starting out in a size 10 shoe and, six weeks later, you need a size 12. The angle of the hoof changes by 3 ½ degrees, on average, over a six-week interval."

Lesser says when things go wrong, it's crucial for veterinarians and farriers to work together to find a solution.

"This is key to success," he says. "Farriers have the skill set and knowledge to treat many issues within the hoof but, without diagnostics that veterinarians can provide, they are working with a handicap."

Reilly concurs. For instance, he says, take navicular bone problems and heel bruises, which both cause lameness and often respond similarly to nerve blocks, or diagnostic analgesia. "They're going to block out the same way," he says. "But, if the cause of lameness is a bruise, now all those trimming and shoeing changes indicated for navicular bone problems—bar shoes, backing up the toe, wedging up the foot—are not only not going to help, they're going to

hurt. They're actually going to make the condition worse because we've just concentrated force in the area of the heel that's bruised."

A thorough clinical exam can reveal important information about the issue, and diagnostic analgesia can help identify areas of pain. But veterinarians typically need diagnostic imaging to get as much information about the problem as possible. Radiographs can help them diagnose issues such as thin soles and negative palmar angles (horses should normally have a slightly positive angle between the bottom of the coffin bone and the ground surface), but they simply can't see every structure within the rigid hoof capsule. Other modalities such as MRI and computed tomography (CT) offer more detailed insight, but not all veterinarians have easy access to these technologies, and not all owners choose to pursue these more expensive options.

"And a lot of times, if an owner can't afford an MRI, now it's back to an educated guess," Reilly says.

This is where veterinarian and farrier communication really comes into play.

"Because I've worked at the same place with the same vets for 15 years, we've all had a very common set of experiences," Reilly says. "So when I say, 'Remember when we did this and it worked and when it didn't work?' We're all drawing off the same experiences."

In field settings certain veterinarians and farriers might not have collaborated on cases before being presented with a challenging lameness. And, Reilly says, it can be tough to get the entire health care team on the same page when they don't share those common experiences. That's why he teaches his vet students the importance of reaching out to their patients' farriers to discuss treatment plans.

For instance, "it might sound great to say put a bar shoe on to treat a problem, but if this horse is already shod with a shorter shoe because nobody can keep a shoe on because it's turned out in a swamp, that's something we need to discuss," he says.

"I work for the owner," he continues. "The vet also works for the owner. Sometimes that direct communication can seem like an unnecessary, time-consuming step or one that could result in confrontation because the vet's going to want to do one thing and the farrier's going to want to do something else."

That communication, however, could ultimately reduce a horse's rehab time and improve his chances of full recovery by simply eliminating steps one party knows won't work but the other might not.

#### **COMMON ISSUES AND TREATMENTS**

Keeping in mind that not all treatment approaches work for all horses, some of the common issues and therapeutic options veterinarians and farriers see and use in riding horses include:

Thin soles "Many of these horses need additional protection to the bottom of the foot," Lesser says. "This could be as simple as applying a shoe or a shoe with a pad to elevate the foot off the ground or added mechanics (i.e., shoeing) to help grow more sole." (The proper movement shoeing enables translates to better blood circulation to the extremities and stimulation of sole and wall growth.) With correct maintenance, most of these horses do very well, he says.

**Poor-quality hoof walls** "These are a problem with horses that like to pull shoes," Lesser says. "Farriers are often reaching for modern material such as glue-on shoes to help these horses with compromised walls continue to be athletic."

*Laminitis* Lesser says he uses aggressive mechanical and medical support to treat these cases. Depending on the severity and the speed of intervention, horses can return to function, although sometimes at a lower level.

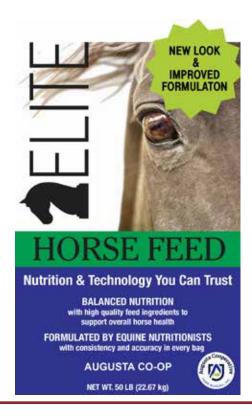
**Podotrochlosis** (aka navicular disease) "We're able to do a lot more now than we used to with more targeted therapies thanks to advances in imaging," he says. "I often shoe these horses in a fashion that the concussion is redistributed away from the navicular region and, depending on the issue, wedging or rockering may be considered. Navicular syndrome is a degenerative disease but, if treated aggressive medically and mechanically, this diagnosis is much more manageable than in the past."

Lower-limb soft-tissue issues "This relies heavily on the location of the injury, chronicity of disease, and severity of the lesion," Lesser says. "A general rule is that the closer to the hoof the injury is, the more helpful therapeutic shoeing can be in the rehabilitation process."

#### TAKE-HOME MESSAGE

A hoof or shoeing issue can, quite literally, stop a horse in his tracks. "If things go wrong," says Lesser, "a veterinarian and farrier team approach to determine the exact cause of lameness and proper medical and mechanical application to rehab your horse's hooves is essential."





#### EVENTS / CALENDAR =

#### **AUGUSTA CO-OP EQUINE & DIAL VIRTUAL SEMINAR**

#### Monday, February 6 | 7 PM - 8 PM

Hear from Purina and local veterinarians about the latest industry trends and science. RSVP required by February 5th.



RSVP Link: https://equineanddial1.rsvpify.com

#### AGRONOMY CUSTOMER APPRECIATION DAY

Friday, February 10 | 11 AM - 2 PM

Augusta Expo Building #2

277 Expo Road, Fishersville, VA 22939

Additional information: **RSVP** to Staci Alger by January 31 at (540) 885-1265 x 253 or SAlger@AugustaCoop.com

#### **BEDFORD AGRONOMY & FEED DIVISION MEETINGS**

#### Thursday, February 16 | 6 PM - 8 PM

The Traveller Event Venue | 3763 Peaks Road, Bedford, VA 24523 Additional information: Producer related meeting, offering door prizes, food, educational material & much more. Dinner served at 6 PM. **RSVP** required to Mikala Liptrap at (540) 430-3169 or MLiptrap@AugustaCoop.com RSVP Link: https://BedfordAgronomy.rsvpify.com

#### **AUGUSTA CO-OP VENDOR DAY**

#### Wednesday, February 22 | 4 PM - 8 PM

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#### **PURINA CHECK-R-BOARD & CHICK DAYS**

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#### **CUSTOMER APPRECIATION**

Saturday, March 18

Staunton Store Location Only Visit AugustaCoop.com for more details.

#### **AUGUSTA CO-OP EQUINE & DIAL VIRTUAL SEMINAR**

#### Tuesday, March 21 | 7 PM - 8 PM

Hear from Purina and leading industry nutritionists about seasonal changes.
RSVP required by March 20th.



RSVP Link: https://equineanddial2.rsvpify.com

#### **SMALL ENGINE OPEN HOUSE**

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