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UNDERSTANDING CHOKE IN HORSES

CHOKES ARE COMMON EQUINE EMERGENCIES WITH POTENTIALLY SERIOUS CONSEQUENCES. HERE'S WHAT YOU NEED TO KNOW.

Esophageal obstruction, or "choke," is a common equine emergency. Unlike in human medicine, choke in horses refers to an obstruction of the esophagus. The most common sign horse owners recognize is feed material coming from the nostrils, although they might also notice choking horses hypersalivating, retching, not eating, acting colicky, or coughing. *Chokes can have serious consequences, so it is important to have your veterinarian evaluate your horse as soon as possible.*

Most commonly, chokes occur when horses eat concentrated feed too quickly without chewing it appropriately. However, esophageal obstruction can also occur with hay or straw, hard treats, carrots, or nonfood objects. Anatomical problems, such as poor dentition and abnormal esophagus anatomy, can also predispose a horse to choking.



While waiting for the veterinarian, it is important that you keep your horse from eating. Hand-walking or muzzling can prevent continued feed intake. Also, it is important to not administer any oral medications. Finally, it is an old wives' tale that you can and should resolve a choke by shoving a garden hose in your horse's mouth— *this only increases the risk of serious complications*, *especially aspiration pneumonia*.

There are two main schools of thought on treating equine esophageal obstruction.

- The first and most common approach is for a veterinarian to sedate the horse and pass a nasogastric tube to clear the obstruction. The veterinarian lavages (flushes) the obstruction with small volumes of water and slowly removes the accumulated feed material. It is important to do this gently to prevent esophageal rupture. With a bad choke this can take upward of an hour.
- The second approach is based on the theory that most chokes eventually self-cure, so veterinarians might administer repeated rounds of sedation, medications to relax the esophageal muscles, and intravenous fluids to keep the horse hydrated.
- Rarely, veterinarians are unable to resolve a choke using nasogastric intubation. In those cases, you might need to send your horse to a referral center for further diagnostics, such as an endoscopic examination.

Following resolution of the obstruction, the horse will need continued care. *Most importantly, chokes predispose horses to aspiration pneumonia*, which is caused by feed material going down the trachea and into the lungs. This foreign material in the lungs can cause the horse to develop a secondary bacterial infection. To prevent this, many veterinarians place horses post-choke, on antibiotics. *It is important to monitor the horse's temperature for several days following a choking episode, because a fever might be one of the first signs of pneumonia.* Other signs include coughing, nasal discharge, and increased respiratory rate or effort.

Depending on the severity of the choke, you might need to withhold certain feed types for several days. Typically, avoid dry feeds and hays and offer the horse a soupy mash of complete concentrate feed. Repeat chokers on certain types of feed might need to remain on soupy mashes indefinitely, and horses that eat too quickly sometimes benefit from having large, smooth rocks placed in their feed tubs. Finally, a common cause of choke is poor dentition leading to inadequate chewing; be sure to schedule a thorough dental exam following a choking episode.

Chokes are common equine emergencies with potentially serious consequences. Call your veterinarian as soon as you notice signs of choke.

FEEDING HORSES FOR JOINT HEALTH

HERE'S WHAT YOU SHOULD KNOW.

TAKE A PROACTIVE APPROACH USING YOUR HORSE'S DIET ~ HOW CERTAIN NUTRIENTS SUPPORT JOINT HEALTH AND THEIR DEVELOPMENT.

WHAT MAKES UP A HEALTHY JOINT?

Proper nutrition can literally make or break joint health. Although a foal's diet as it grows influences skeletal health most, its nutrition throughout adulthood also plays a role. We typically think of minerals such as calcium and phosphorus when talking about bone integrity, but vitamins, amino acids (the building blocks of protein), and energy also have their place when feeding for joint health.

YOUNG, GROWING HORSES

Postnatal growth is our main window to potentially optimize the horse's long-term skeletal health. Growing horses are at risk of acquiring developmental orthopedic diseases (DODs). These encompass all growth disorders in foals, including osteochondrosis (OC, which causes lesions in the cartilage and bone of youngsters' joints), subchondral cystic lesions, angular limb deformities, physitis (growth plate inflammation), flexural deformities, cuboidal bone abnormalities, and juvenile osteoarthritis. Factors that predispose foals to DODs include bone trauma, rapid growth rates, genetics, hormonal imbalances, and, not surprisingly, nutrition.

Surveys by German and Dutch researchers indicate OC can affect all horse and pony breeds and its incidence in horses younger than 2 might be as high as 50%. Diet prior to and throughout weaning is key to proper joint cartilage maturation; OC results when the cartilage matures abnormally. Feeding that Thoroughbred colt to sell him as big, strappingly handsome yearling, for instance, might have dangerous consequences. That's because feeding excess energy (calories), which leads to greater weight gain and growth, might negatively affect his skeletal development, especially if other nutrient needs (such as protein) are not met.

Researchers in Australia found that when they fed energy at 120% of National Research Council's (NRC, authors of Nutrient Requirements of Horses) recommendations per day, weanling foals developed OC lesions consistently, while their counterparts fed energy at 100% daily didn't. Researchers have implicated energy from concentrates, in particular, as a cause of OC lesions due to the connection between certain hormones and cartilage development. The hormone insulin affects articular cartilage growth, and post-meal elevated blood glucose and subsequent insulin levels might alter the cartilage growth.

In a 1996 study, researchers at Rutgers University fed a diet of 50% commercial sweet feed and 50% alfalfa grass mix hay to eight weanlings, four yearlings, and three 2-year-olds, four of which had radiographic (X ray) evidence of OC lesions. The scientists observed higher post-meal

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changes in blood-glucose and insulin-levels in youngsters with OC lesions, implicating a connection between metabolism and joint-development. *Contrary to popular belief, feeding high or low levels of protein impacts foal growth rate but not DOD development.*

FEEDING THE YOUNG GROWING HORSE FOR JOINT HEALTH

Calcium and phosphorus contribute the most to bone and joints' mineral pool. A reversed calcium-to-phosphorus ratio (less than one to one) and calcium or phosphorus deficits, regardless of the ratio, can negatively affect a young, growing horse's joints, says Sarah Ralston, VMD, PhD, Dipl. ACVN, who recently retired from her post as professor and associate director of teaching at Rutgers University, in New Brunswick, New Jersey.

The microminerals, copper and zinc, help the horse's body develop and repair collagen. In a study of Thoroughbred mares grazing on pasture with low dietary copper (less than 10 parts per million), for instance, copper supplementation significantly reduced the incidence of physitis in their foals.

"Excessive vitamin A (>100,000 International Units per day to an average sized pregnant mare) has been implicated as a cause of birth defects in horses, which can occur if a pregnant mare consumes multiple supplements and fortified grain.", says Ralston.

NUTRIENT	DON'TS	DOS
Energy	Do not overfeed calonies, and limit access to mare's concentrate if necessary	Do ensure adequate calorie intake, creep feeding if necessary
Protein	Do not underfeed protein or essential amino acids	Do provide adequate-quality protein for essential amino acids, especially lysine, creep feeding if necessar
Minerals	Do not underfeed calcium or phosphorus.	Do provide adequate calcium and phosphorus prior to wearing.
	Do not underfeed copper, especially after wearing (+10 ppm)	Do ensure the calcium-to-phosphorus ratio is between 1:5:1 and 2:1.
	Do not overfeed zinc.	After weaning, do feed 0.25 mg copper per kg body weight per day.
		Do ensure the zinc-to-copper ratio does not exceed 5:
Vitamins	Do not overfeed vitamin A (+100,000 it) per day)	Do provide vitamin A only when feeding older stored hay and pasture is not available.
		Do provide vitamin D only if no tumout is provided.
Overall		Monitor growth rate to maintain consistency and prevent growth spurts.

- So, what can we do to optimize joint health in young, growing horses? NRC authors say joints appear to have different "windows of susceptibility" after which OC lesions are less likely to resolve on their own—at about five months of age for hocks and eight to 12 months for stifles.
- "The goal should be to provide adequate energy, protein, and mineral intakes to sustain a steady growth rate throughout the first year of life to avoid DODs," says Ralston.
- Around the second or third month of age, the calcium and phosphorus levels in the mare's milk might no longer meet the growing foal's needs. At this point owners often supplement the foal's diet with creep feed or minerals designed for growth, particularly if the forage does not adequately meet their needs, either.
- After weaning Ralston, suggests feeding the best-quality forage available, such as a legume mix for quality protein and mineral intake. Feed at least 2% of the horse's body weight per day in dry forage matter. If concentrates are needed to balance minerals, Ralston recommends using forage-based products designed specifically for rapidly growing young horses. If feeding a grain-based product, feed no more than 0.25% to 0.4% body weight per meal, and do not exceed 1% body weight per day. When using a highly concentrated supplement such as a ration balancer, which is designed to be fed in very limited amounts, be sure to follow feeding recommendations on the label.

BROODMARE

In 1938, researchers at the University of Cambridge, in England, began to unravel the connection between maternal environment and nutrition on foal development. Their studies indicated just how influential nutrition can be for development. During pregnancy, the mare's daily nutrition requirements are high enough to maintain her own condition, as well as support the growing fetus. Most fetal growth occurs during the third trimester, and nutritional needs change accordingly.

According to Nutrient Requirements of Horses: Sixth Revised Edition (2007), the mare's calcium and phosphorus requirements increase around the seventh month of pregnancy as the fetus begins to use these minerals. While she's lactating, her calcium and phosphorus needs remain elevated. Mares mobilize calcium from their own bones during this time, but bone mineral density returns to normal once they're no longer producing milk.

Calcium and phosphorus deficiencies can have dramatic consequences in developing foals, such as enlarged joints and poor bone mineralization. In 1993, Michael Glade, PhD, found that foals from mares on diets containing insufficient calcium levels had weaker bones at birth. Because mare milk contains very little copper and foals are not capable of absorbing copper well during the first few months of life, maternal copper intake vitally influences the foal's copper stores in the liver during gestation. Elevated copper in the liver at birth appears to help repair cartilage lesions (van Weeren et al., 2003). A mare's inadequate copper intake might result in her foal developing OC lesions; however, in a large study of Hanoverian foals, researchers reported no relationship between mare copper intake and foal OC lesions (Winkelsett et al., 2005). Clearly, more work needs to be done to understand the connection between dietary copper and DODs.

NUTRIENT	DONTS	D0'S ()
Energy	Do not overfeed calories	Do provide adequate calories to maintain body condition, increasing during late gestation and lactation.
	Do not feed high-starch concentrates	
	i-1 gram per kilogram of body weight per meal	Do provide a balance of calories from high-quality fiber, fat, and nonstructural carbohydrates throughout gestation.
Protein	Do not underfeed protein or essential amino acids	Do provide adequate-quality protein with essential amino acids, especially fysine, and increase levels in late gestation through lactation
Minerals	Do not underfeed calcium or phosphorus, especially during labe gestation and lactation.	Do ensure the calcium-to-phosphorus ratio is between 1.5(1 and 2:1 during gestation and lactation.
	Brancheston Carrol Introduction	Do feed copper at 0.25-0.4 mg per kg body weight during
	Do not underfeed copper during gestation	gestation.
Vitamins		Do provide vitamin D only if no turnout is provided.

Kristen M. Janicki, MS, PAS



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horse.

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