

BRIDGE THE GAP BETWEEN

# OCD AND Nutrition



Conformation flaws of the limbs are easily identified. With time, even the most novice horsemen can develop a practiced eye for a buck-kneed, splay-footed, calf-kneed, or pigeon-toed horse. Horses with straight legs often, though not always, remain sounder through the rigors of training and competing than their crooked-legged counterparts. From casual inspection, however, it's impossible for horsemen to know what's happening to bone beneath the skin. One of the most career-debilitating bone afflictions of young horses is osteochondritis dissecans (OCD), a developmental orthopedic disease that's invisible to the eye.

OCD can be defined simply as an interruption in bone development.

During normal bone growth, cartilage is remodeled into bone. It is during this physiologic revision that ossification goes awry and OCD lesions originate. On radiographic or arthroscopic examination, these lesions appear as flaps, which in severe cases may actually detach from the bone and enter the joint capsule. These free-floating flakes of cartilage are called joint mice.

Some lesions are detectable when horses are as young as one month of age, but most are likely formed by the time horses are six months old. Usually, however, lesions are not diagnosed until later in life. In racehorses such as Thoroughbreds and Standardbreds, lesions are often detected when horses enter training, usually by two years of age. Because warmbloods are not started in training until they are older, lesions may not be discovered until horses are five or six years old.

Three categories of OCD lesions are recognized: (1) those showing clinical and radiographic signs; (2) those showing clinical without radiographic (but arthroscopic) signs, and (3) those showing radiographic but no clinical signs. Clinical signs of OCD include joint effusion or swelling and lameness of varying degrees. Often clinical signs are absent altogether.

In typical cases of OCD, horses have one or two lesions that are frequently bilaterally symmetrical, which means that if the joint of one hind limb is affected the contralateral joint

**“He stands correct, but how does he look on film?”**

may also be diseased. Severity of bilaterally symmetrical lesions may differ; only one, for instance, may cause lameness or other clinical signs of disease. Interestingly, if a lesion is found in one fetlock, practitioners will often radiograph the remaining three fetlock joints because there is a tendency for OCD to be present quadrilaterally. Once again, clinical signs may not accompany all lesions. In rarer instances, horses present with multiple lesions in various joints and bilateral symmetry may not be evident.

Veterinarians have pinpointed certain joints in which lesions typically occur including the fetlock, shoulder, stifle, and hock. Though less common, lesions have also been described in the elbow, hip, and cervical vertebral joints.

Much of the research conducted on OCD has involved Thoroughbreds, Standardbreds, and various warmblood breeds, primarily Swedish and Dutch Warmbloods. While researchers have focused on these breeds, OCD has been identified in seemingly all breeds of horses.

One study involving 161 horses affected with stifle OCD included 82 Thoroughbreds (51%), 39 Quarter Horses (24%), 16 Arabians (10%), 9 warmbloods (6%), 5 crossbreds (3%), 3 Paints (2%), 3 Appaloosas (2%), and 4 horses of unknown breeding (2.5%).

Researchers have been wrestling with OCD for nearly 50 years; the first mention of the syndrome appeared in veterinary literature as early as 1947. As interest in OCD has mushroomed in the scientific community, a well-defined set of causative factors has been cataloged. Sitting atop the list of potential causes is nutrition.

**“Hip 241 is a nice-bodied colt and bred well, but has Doc read the radiographs yet?”**

**“She’s a great mare but it seems every one of her foals has problems with OCD.”**

## Reducing the Incidence of OCD Through Nutrition

Nutrition is thought to play an important role in the pathogenesis of OCD. Deficiencies, excesses, and imbalances of nutrients may result in an increase in the incidence and severity of the syndrome.

Appropriate mineral balance of rations is of particular importance in deterring the development of OCD. Deficiencies of calcium, phosphorus, copper, and zinc may invite bone growth problems. Less common than mineral deficiencies are mineral excesses, which usually occur because of overfortification or environmental contamination. Though massive supplementation can occur, environmental contamination is a more likely cause. If a farm is experiencing an unusually high incidence of affected foals or if the location and severity of the lesions are abnormal, environmental contamination should be investigated. Blood, feed, and water analysis should be performed. Chemical analysis of hoof and hair samples may uncover the underlying cause in such a situation. Farms that are located near factories or smelters are the most likely candidates for this type of contamination, although OCD from a zinc-induced copper deficiency has been reported on farms using fence paint containing zinc or galvanized water pipes.

The ratio of minerals may be just as critical as the actual amounts of individual minerals in the ration. Too much calcium, for instance, may stand in the way of proper absorption of phosphorus, zinc, and iodine.

Excessive energy intake can lead to rapid growth and increased body fat, which may predispose young horses to OCD. A study conducted by Kentucky Equine Research in the mid-1990s revealed that growth rate and body size may increase the incidence of OCD in Thoroughbred foals. Yearlings that possessed OCD of the hock and stifle were large at birth, grew rapidly from three to eight months of age, and were heavier than the average population of yearlings.

The source of calories for young horses may also be important, as hyperglycemia and hyperinsulinemia have been implicated in the pathogenesis of OCD. Foals that repeatedly experience an exaggerated and sustained increase in circulating glucose or insulin in response to a carbohydrate (grain) meal may be predisposed to the development of OCD. Studies with fetal and foal cartilage cells suggest that the role of insulin in growth cartilage may be to promote cell survival and that hyperinsulinemia may be a contributory factor in OCD. To help protect foals from OCD, therefore, it is prudent to feed them concentrates that produce low glycemic responses, such as those that incor-

porate fat and fiber as energy sources. These specialty feeds minimize the amount of sugar and starch in the diet, thereby reducing the likelihood of OCD.

## Feeding Practices

One of the most common problems of feeding young horses is excessive intake that results in accelerated growth rate or fattening, two conditions that may result in OCD. Calorie consumption is key. Large intakes of grain are appropriate if the forage is sparse or poor quality. For example, grain intakes as high as 2% to 2.5% of body weight may be necessary to sustain reasonable growth in weanlings that have no access to forage other than tropical pasture. Conversely, grain intakes higher than 1% of body weight may be considered excessive when weanlings are raised on lush pastures or have access to high-quality alfalfa hay.



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Occasionally, the concentrate offered to a growing horse is incorrectly fortified to complement the forage that is being fed. The problem occurs particularly when the forage is mostly alfalfa or clover. Most concentrates for young horses are formulated with levels of minerals and protein needed to balance grass hay.


Inadequate fortification of grain is another concern for managers of young horses. The most common reasons for inadequate fortification are using unfortified or underfortified grain mixes, using correctly fortified feeds at levels of intake that are below the manufacturer's recommendations, or using fortified feeds diluted with straight cereal grains. These errors in feeding can be corrected by the incorporation of a highly fortified grain balancer supplement. Feed stores typically stock a supplement pellet that will round out the nutritional profile of the young horse's diet.

### Prevention

In almost every circumstance of OCD, the surest way of determining if nutrition is a contributing factor is to perform a ration evaluation, which compares the intake of several essential nutrients with the requirements of the horse. Gross deficiencies or excesses of key nutrients can then be identified and corrected.

Ration evaluations can be approached in two ways. One way is to add up what is being fed and compare it to the horse's requirements. This is actually more difficult than it may first appear since most horsemen do not actually know exactly what their horses are eating. Alternatively, a new ration may be developed.

One easy way to determine the appropriateness of a ration is through the use of Gro-Trac, the growth-monitoring software designed by Kentucky Equine Research. One special feature of Gro-Trac is the ration evaluator, which allows users to work with their feed manufacturers in determining the best feed for their horses. For more information on Gro-Trac, please contact Kentucky Equine Research at 859-873-5663.

Not all cases of OCD can be traced to a nutritional origin. Other factors such as heredity and trauma may also be implicated. By feeding a well-balanced, low-starch diet and aiming for moderate growth, breeders can help build a sound skeleton and a solid foundation for a long-lasting athletic career. 

### 2003 Kentucky Equine Research Nutrition Conference

For the first time since its inception 13 years ago, the Kentucky Equine Research Nutrition Conference was held on foreign soil in Sydney, Australia. From August 23-25 nearly 250 horse owners, stud managers, scientists, and veterinarians gathered in the capital city to attend a series of talks chock-full of information on growth and development of the equine skeleton.

The symposium included presentations by leading researchers in the field of equine orthopedics. The featured speaker of the conference was Dr. C. Wayne McIlwraith of the University of Colorado, widely acclaimed as the pioneer in equine arthroscopic surgery. In addition to equine nutritionists Drs. Joe Pagan, Larry Lawrence, and Peter Huntington from Kentucky Equine Research, presentations were given by Drs. Brad Dowling, Neville Grace, Andrew Dart, and Elwyn Firth, as well as Ms. Elizabeth Owens.

Topics presented at the symposium included surgical and medical management of osteochondritis dissecans (OCD), the role of nutrition in the management of developmental orthopedic disease (DOD), principles of bone development, nutritional assessment of weanlings and yearlings, managing growth for different commercial end points, conformation and its relationship to soundness, effects of growth promotants in growing horses, and the effects of exercise and training on skeletal development.

### Miss the Conference But Still Want the Information?

Information disseminated at the conference has been archived in a spiral-bound proceedings. Sixteen fact-filled papers are contained in a 200-plus-page booklet. This compilation is undoubtedly one of the most comprehensive publications on growth and development of horses ever assembled. All of the articles contain the findings of recent scientific trials and valuable reference lists.

To order a copy of the proceedings, contact Kentucky Performance Products at 1-800-772-1988.

