**Developmental Orthopedic Disease**

Developmental orthopedic diseases (DOD) include several conditions that arise in response to alterations in endochondral ossification, i.e., the process by which bones grow. Disturbances in bone growth can result from trauma, genetic predisposition, unusually rapid growth, and nutritional imbalances such as excessive calories, high-starch diets, calcium/phosphorus imbalances, and mineral deficiencies. In addition to controlling the diet, supplemental administration of trace minerals has been associated with an increase in bone density in thoroughbred yearlings, especially when mineral intake is suboptimal. Furthermore, mineral supplementation is generally recommended for growing horses. In addition, copper supplementation of pregnant mares may also reduce the risk of DOD in their foals, and providing supplemental copper to foals has been associated with a reduction in lesions consistent with DOD.

**Conclusion**

Dietary supplementation of young and adult horses is a key component to ensuring optimal growth, development, and maintenance of connective tissues, such as bones, ligaments, tendons and cartilage. Providing appropriate amounts of vitamins, minerals **including silicon** and omega-3 FAs, such as those in Platinum Performance® Equine and Osteon®, is one way to achieve this. Not only does this play a role in optimizing exercise performance, but it is critical to the general well-being of all horses.

**Putting it into Practice**

• To promote normal healthy bone and connective tissue health, provide a high forage/low concentrate diet. Supplement with Platinum Performance® Equine to provide omega-3 FAs, silicon, vitamins, minerals and antioxidants.

• In horses recovering from bone or soft tissue injury, supplement with Platinum Performance® Equine and Osteon®.

• In racehorses in training and racing, supplement with Platinum Performance® Equine and Osteon®.

---

**Literature Cited**

detrimental effects of processing and storage, the best way to add omega-3 FAs to the equine diet is through supplementation.

Vitamins D, A and C

Vitamins D, A and C are critical for the health of connective tissues. Although vitamin D is synthesized naturally by most animals, horses that are stabled or have insufficient access to relatively fresh hay or pasture may require supplemental vitamin D. As evidence of this, analysis of alfalfa hay revealed that the vitamin D content was nearly 80% lower six weeks after bailing when compared to fresh alfalfa (Figure 4). Vitamin A is obtained by the horse predominantly through consumption of green forage. However, environmental factors such as sunlight, processing, exposure to air, and moisture can significantly decrease vitamin A activity in hays. Vitamin C's role in collagen and bone matrix formation make it a popular supplement and important nutrient for young, rapidly growing horses. In addition, vitamin C supplementation has been recommended for horses with arthritis or soft tissue injury.

Potassium, Magnesium and Boron

In addition to silicon, other minerals are important to maintain healthy bones. For example, high-grain/low-forage diets tend to be low in potassium, which may be important because the availability of potassium reduces the loss of calcium from bone. Magnesium also is important to ensure adequate strength of bones by preventing the formation of crystals that lead to brittle bones, and boron helps maintain bone mineral content and density possibly by promoting the generation of steroid hormones.