DuraPlex™ – Improving Bone Health

DuraPlex is a proprietary blend of specific proteins, minerals and vitamins scientifically proven to increase bone mineral density and bone area in both performance and growing horses. Studies at Kentucky Equine Research with exercised Thoroughbreds showed positive changes in bone quality after just one month of supplementation. DuraPlex was also shown to prevent the natural demineralization that occurs when access to free-choice exercise is restricted such as when young horses enter a training environment or during stall rest due to injury.

Bone Formation and Effects of Exercise

Many horses begin their athletic careers long before they have reached maturity. Racehorses enter training at 18 months of age, and many will race before they have reached two years old. The change in environment from the breeding farm to the training stable is quite dramatic, especially from a physiological perspective. Recent research has focused on how changes in environment and management affect the musculoskeletal system of the horse. Horses are born with 17% of their mature bone mineral content (BMC). At one year of age, horses have only 76% of mature BMC, and complete mineralization is not reached until six years of age.

Horses are often expected to be competitive athletes at just two years old, which results in significant stress being placed upon immature bones and joints. A horse traveling at race speeds places extreme force on its legs, sometimes as much as three times its body weight. Many horses are unable to withstand heavy training at a young age. Statistics reveal that thousands of two-year-olds are afflicted with bone-related lamenesses, and many break down while training or racing. Maximizing bone density is important in improving bone strength and preventing bone injuries.

Bone injuries related to heavy training usually begin as microfractures in the bone matrix that, with increased stress, can manifest into catastrophic career-ending injuries. Building and maintaining strong, well-mineralized bone can act as insurance policies against these injuries. Although attention to conformation, foot balance and track design all play an important part in preventing skeletal injuries, increasing cortical bone density by building stronger bone is vital. This can be achieved through a combination of nutrition and exercise.

Bone engages in a continuous cycle of remodeling that is influenced by many factors including age, season, nutrition and exercise. The skeleton is made up of more than just calcium. Other minerals such as magnesium, sodium and potassium are essential in bone-building processes. Aside from minerals, another major component is the protein collagen. Bone can be compared to reinforced concrete with calcium as the cement and collagen as the reinforcing rods.

It is well known that bone density is built and maintained when force or impact is applied. Several studies have shown the positive effect training has on increasing bone density in young horses. For instance, two-year-old Thoroughbreds that entered training with restricted free-choice exercise exhibited a drop in bone density, which later increased with the onset of heavy exercise. However, heavy exercise was introduced after a period of demineralization when bone may have been at its most vulnerable, increasing the risk of bone-related injury.

Feeding Directions

Top-dress on feed at a rate of 120 g per day. For best results, split into two 60-g feedings.

1 scoop = 30 g

KERx SPECIAL NEEDS NUTRITION™

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A division of:

Kentucky Equine Research®
Official Equine Nutritionist of the USEF

DuraPlex

DuraPlex has been formulated by KER using the latest knowledge and research on bone development. In conjunction with carefully planned exercise and a balanced daily ration, supplementation with DuraPlex can result in improved bone density and skeletal durability. Young horses will be able to stay in training longer, avoiding the interruptions that bone injuries cause.

DuraPlex positively impacts orthopedic tissues so they possess greater ability to withstand the rigors of training and competition. Using radiographic photometry (Figure 1), a sensitive and noninvasive method of monitoring change in bone mineral content, KER observed bone changes in a group of growing Thoroughbred horses that were exercised and unexercised.

Two-year-old Thoroughbreds supplemented with DuraPlex and given access to daily turnout but no formal exercise showed greater bone growth and bone mineral content (Figure 2) than control horses. Among the exercised horses, DuraPlex-supplemented horses showed less demineralization than control horses (Figure 3).

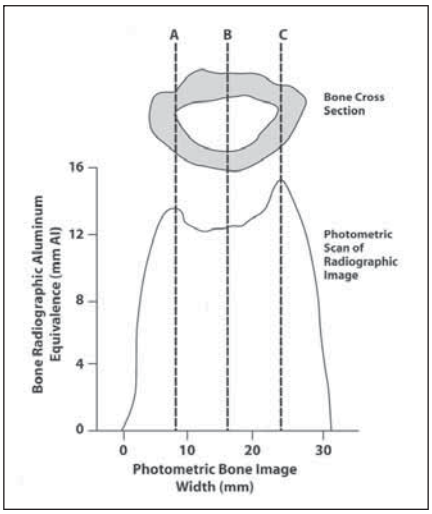

Figure 1. Bone mineral content is expressed as a radiographic bone aluminum equivalence (RBAE). Selected points on the cannon bone are scanned and lateral, medial and midpoint RBAE are generated to calculate actual bone mineral content.

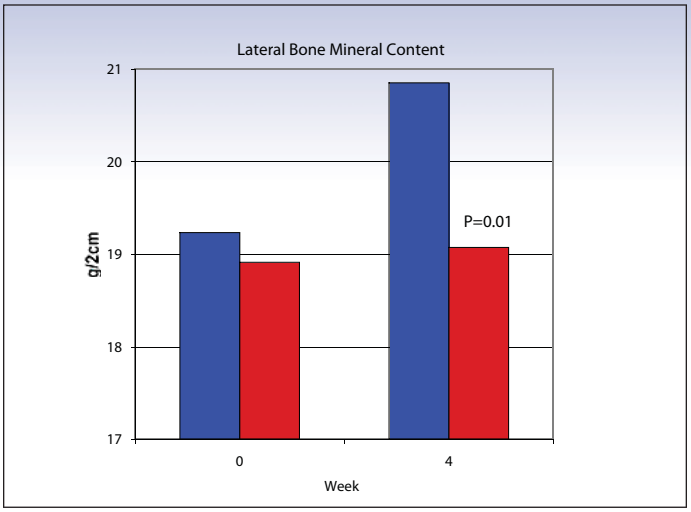

Figure 2. Bone mineral content of supplemented (■) and control (■) two-year-old Thoroughbreds that received no exercise and 5-6 hours of daily turnout. Horses receiving DuraPlex showed significantly more bone mineral content after 4 weeks of supplementation compared with control horses.

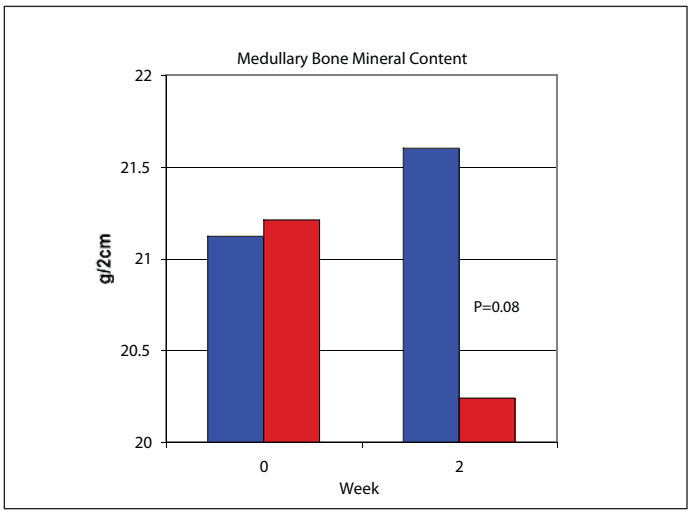

Figure 3. Medullary bone mineral content of supplemented (■) and control (■) two-year-old Thoroughbreds during an exercise study. Horses receiving no supplementation exhibited demineralization of bone, which is typical of young horses in training situations when access to free-choice exercise is restricted. DuraPlex supplementation prevented this bone loss.

Guaranteed Analysis

Nutrient	Per 120 g
Calcium	10000 mg
Phosphorus	5000 mg
Magnesium	2000 mg
Copper	60 mg
Zinc	120 mg
Manganese	100 mg
Vitamin A	5000 IU
Vitamin D_3	4000 IU

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