



Supporting Your Horses' Bones & Joints Naturally

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Horses endure a significant level of stress to their bones and joints during stages of growth and development as well as during exercise, training, and performance. These circumstances can lead to the onset of inflammation, acute and chronic arthritis, brittle bones and lameness issues; all-too-common occurrences in the bones and joints of horses.

So what can be done to prevent and minimize the impact of such damage?

Nature provides the horse with an array of ingredients that assist in creating bone, supporting connective tissues, and the repair of damaged tissues as well as regulation of normal bodily functions. These ingredients are commonly referred to as minerals and vitamins.

MINERALS AS BUILDING BLOCKS

Minerals are an essential part of your horse's dietary needs and are required for horse maturity, maintaining energy and performance, and in the prevention of health problems. There are two types of minerals; macrominerals which are required in large amounts within the horse's body and microminerals (also referred to as trace minerals) which are required in small amounts. Minerals compete for absorption during digestion, but too much of one mineral can result in a deficiency of another. This is why supplementation that is being done as a nutritional stopgap should provide paired minerals to ensure no inadvertent deficiencies are created. Keep in mind that daily nutrition requirements are based on the horse's age, weight and work regimen and each horse should be evaluated based on their individual needs.



Selena O'Hanlon, Canadian Eventing Team Silver Medalist

Calcium is the most required and therefore the primary mineral in your horse's diet for bone development and maintenance. A healthy adult horse needs 20 g of calcium per day¹³ and it should be provided in a formula that may include phosphorus (14g/day¹³). Phosphorus aids in the development of bones, teeth as well as supporting the horse's metabolism¹³. The absolute intakes of calcium and phosphorus by horses must be adequate, because if calcium intake is less than phosphorus intake (ratio less than 1:1), calcium absorption may be impaired¹⁰ and a deficiency can occur.

Similar to the relationship between calcium and phosphorus, calcium and magnesium should be kept at a 2:1 ratio as this is roughly in line with recommended intakes of each mineral⁸. *Magnesium* is a crucial component in skeletal development, muscles, nervous tissue and overall joint health. In fact, every major biological process in your horse's body requires the presence of magnesium. Although there is a recommended daily allowance of magnesium, it is safe to say that 7.5 g per day^{10,13} will be an adequate amount to administer.

A healthy adult horse requires 30-40 mg of *Zinc* per day¹⁰ as it is important in the development of healthy hooves and bones and is a cofactor of *Vitamin D₃* which is essential for calcium and phosphorus metabolism in normal bone growth and development.

Zinc's competitive partner is *Copper*. This mineral is necessary to obtain bone and cartilage development but only in tiny amounts. A daily dose of 75 mg of copper⁷ is sufficient.

Boron is also necessary for bone and joint health¹¹; however there is no conclusive research that defines the adequate intake level for a horse. Empirical evidence shows that it helps prevent loss of calcium and magnesium through the urine, especially when low levels of magnesium are evident¹.

BOOSTING THE IMMUNE SYSTEM

When a horse's immune system is low, its bodily defences become weakened and allow greater vulnerability to illness and injury. Inflammation is a result of the natural consequence of chemical reactions that occur when the horse's metabolic balance is no longer functioning to its full potential. Such circumstances permit inflammation to spiral out of control causing pain in joints, tissue damage and the potential for arthritic conditions⁹.

Anti-oxidants help construct a security system for the bones and joints by quenching free-radicals -- the immune system saboteurs, and by providing a protective function by boosting the immune system.

There are many anti-oxidants that are beneficial to bone and joint health. *Alpha Lipoic Acid* is one in particular that serves to reduce inflammation¹² in arthritic conditions².

B Complex Vitamins also aid in reducing joint inflammation through their impact on the inflammatory marker, homocysteine⁶.

Vitamin C is a powerful anti-oxidant that not only assists in joint inflammation reduction, but also promotes cartilage healing³. *Vitamin C* works great alongside *Vitamin E*, which improves pain control⁴ and increases immune function in horses.

Another biological anti-oxidant is *Selenium*. This essential component to your horse's diet aids in the detoxification of lipoperoxide and hydrogen peroxide which are toxic to cell membranes, however one must monitor the levels of Selenium

intake as there is a fine line between deficiency and excess, both of which can be detrimental to the horse's health. No more than 0.8 mg should be given to a horse in a single day⁸.

Biotin greatly increases the overall health of the hoof by improving horn hardness, growth rate and tensile strength. A focus on sound feet allows pressure and exertion to be taken off the horse's limbs and joints^{5,8}.

CARE & PREVENTION

The horse's body was designed to be active, perform delegated work and to be load bearing, all of which cause wear and tear on the horse's skeletal structure. Regular and gentle exercise assists in the care of the horse's joints by strengthening muscles, supporting bone structure and nourishing the joints with circulating joint (synovial) fluid.

Keeping a watchful eye on the nutritional value in your horse's feed and forage is important in determining whether or not they require supplementation in order to sustain a strong immune system or to build and protect their bones and joints.

Each horse is different when it comes to their age, weight and work regime; therefore your horse's supplementation should be evaluated based on their individual needs. It's recommended that you consult with your veterinarian for guidance when adjusting your horse's feed and nutrient content.

Lauren Marlborough has been an avid horsewoman for over 15 years with several years experience in many sectors of the horse industry. She carries a BSc from Lakehead University, an Honours Biological Science post-graduate degree from Brock University, Certification as an Equine Sports Massage Therapist, is currently pursuing the Equine Science Diploma from the University of Guelph and has her own equine therapy business in Southern Ontario.

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