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The Importance of Sustaining Bone Density in Layups

Research has revealed that one of the keys to healthy bone formation is exercise. Exercise stresses the bone and stimulates bone remodeling. When horses are kept in stalls due to injury or illness, the stress on the bones is insufficient to maintain optimal bone metabolism and bone density is quickly lost.

Bone remodeling occurs throughout a horse's lifetime and is essential to the maintenance of proper development, soundness, and longevity. Remodeling is active in horses of all ages. Remodeling allows the horse to replace bone that has been damaged during an injury, as well as repair microscopic bone damage caused by recurring microtraumas. The repair of microtraumas is particularly important to the equine athlete. Microdamage that is repaired too slowly or left unrepairs is a precursor to more severe injuries. Confined horses that are recovering from soft tissue damage, skeletal injuries or other illnesses are put at increased risk for additional lameness and injury due to a reduction in bone density.

In order for bone remodeling to take place during a layup period, the horse needs an adequate supply of readily available calcium and a host of trace minerals, including boron and silicon. BoneWise™ contains Lithothamnion, a highly bioavailable marine source of calcium and trace minerals. Vitamin D also plays an integral role in bone metabolism and is provided in BoneWise.

BoneWise is scientifically developed to:

- Maintain optimal levels of bone density when horses are most at risk for bone loss
- Provide a readily absorbable source of calcium
- Supply additional trace minerals used to build strong bones
- Support enhanced bone mineral content and bone metabolism that encourage the swift repair of microdamage

- Supply yeasts that support improved mineral and vitamin digestibility
- Sustain vitamin D at levels necessary for healthy bone development

Recommend BoneWise to sustain optimal bone density in horses that are:

- Recovering from a soft tissue or skeletal injury
- Exhibiting signs of bucked shins, osteochondritis dissecans (OCD), and other developmental bone diseases
- Confined to a stall during recovery from illness
- Growing (weanlings, yearlings and 2-year-olds), especially those that are being kept in stalls during training or sales prep

To encourage optimal bone metabolism during layup:

Supplement with 1 scoop (2 ounces) of BoneWise twice per day for the duration of the confinement. To encourage sufficient bone remodeling and reduce the risk of additional injury when exercise or turnout is resumed, continue BoneWise for an additional 4 to 6 months.



BoneWise is recommended for horses:



**Confined to
a stall or laid up
for any reason**



**In training
or competing
regularly**



**Exhibiting signs
of bucked shins
or developmental
bone diseases**



**Recovering from
a skeletal injury**

Lithothamnion, a unique source of calcium and trace minerals

BoneWise contains a unique form of calcium, a calcareous marine alga known as Lithothamnion, which is rich in highly digestible calcium and trace minerals. Lithothamnion contains three crystalline forms of calcium: calcite, aragonite, and vaterite, as compared to calcium carbonate (a common source of calcium) that contains only calcite. The minerals found in Lithothamnion are arranged in a distinctive honeycomb construction that increases digestibility. Because of its varied crystalline forms and honeycomb structure, Lithothamnion provides a large surface upon which digestive enzymes can act, allowing

for the optimal release and uptake of minerals over extended periods of time. Lithothamnion contains the trace minerals magnesium, boron, silicon, zinc, and manganese, all of which play a role in bone formation and remodeling.

Research conducted at Michigan State University on two groups of yearlings—one supplemented with Lithothamnion, the other (the control) supplemented with calcium carbonate—revealed that the Lithothamnion group showed significant difference in blood markers of bone metabolism and bone density as compared to the control group. Osteocalcin, which is a measure of bone formation, and CTX-1, a measure of bone resorption, were both higher in the supplemented group, indicating a positive effect on bone metabolism. At the end of the supplementation period, the Lithothamnion supplement group presented with 11% greater bone mineral content.

Lithothamnion's honeycomb structure increases the surface area available to digestive enzymes, allowing for more efficient digestion and absorption.

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