



NUTRITION NOTES

Innovation + Research from Kent Nutrition Group

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COMPLEXED ORGANIC TRACE MINERALS IN SENTINEL® AND DYNASTY®

The trace minerals zinc, copper, and manganese, are essential nutrients that have been proven to positively affect many vital functions. Some of these functions include:

- Immune system function and response
- Hoof growth, maintenance, and integrity
- Reproductive performance in mares and stallions
- Joint and skeletal development, growth, maintenance and repair
- Skin and hair coat production and maintenance

Trace minerals are required in very small amounts in the diet. Ensuring that animals receive the correct amount and balance can be challenging, especially when absorption from the digestive tract may be impaired. Interference by substances in the feed or water, physical or environmental stress, or nutrient imbalances can prevent the absorption and effective utilization of these minerals. Feeding the more biologically active and available forms of trace minerals such as Zinpro Performance Minerals® has shown to positively affect trace mineral absorption (Wedekind et al., 1992).

Zinpro Performance Minerals (ZPM) consist of one metal ion (trace mineral) complexed to one amino acid. This unique structure decreases interactions with antagonists and competition for metal transporters, thereby improving absorption and trace mineral status in the animal (Figure 1).

Numerous studies in cattle, swine and poultry have shown improvements in hoof growth and integrity, reproductive performance, immune system function and mineral status during stress when complexed trace minerals were fed. While data has been more limited in horses, research efforts have been increasing in the equine nutrition field.

IMMUNE CHALLENGE RESEARCH

The effect of Zinpro Performance Minerals on humoral immune response in growing horses is shown in Figure 2. The primary antibody titer response to a foreign antigen (pig red blood cells) inoculated into growing horses was higher at day 7 and remained higher on day 14 for horses fed the ZPM compared to ordinary sulfate forms. This type of response is important for successful vaccination programs and disease resistance.

Figure 1:

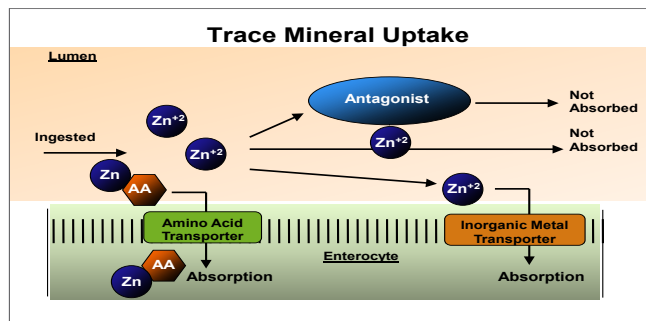
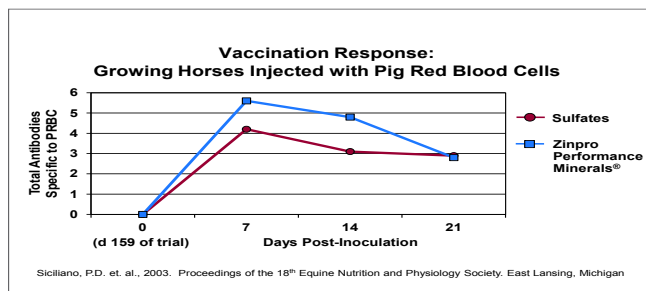


Figure 2:



continued

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The effect of Zinpro Performance Minerals on passive immunity is shown in Figures 3 and 4. Mares in late gestation fed ZMP had higher immunoglobulin (IgG & IgA) levels in colostrum and suckling foals exhibited increased circulating IgG and IgA immunoglobulins. This response suggests the transfer of higher levels of immunoglobulins to the foal via mare colostrum, thereby offering greater disease protection and ability of the foal to fight off infections.

Figure 3:

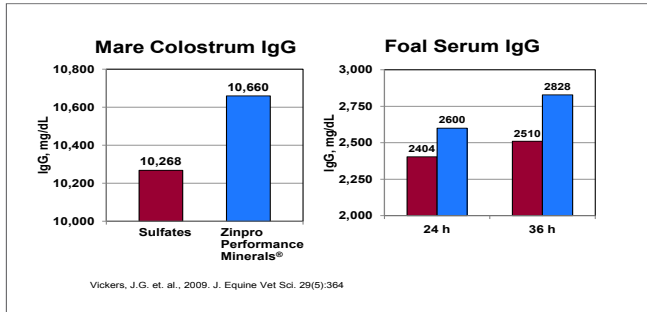
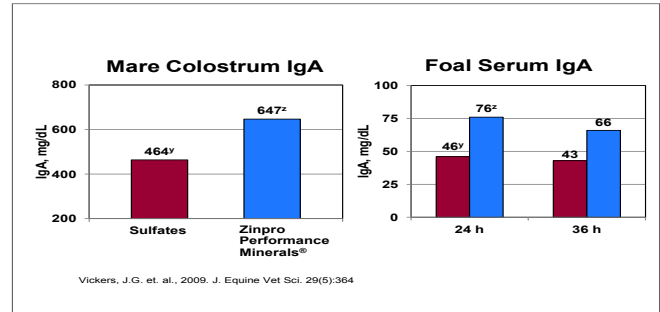


Figure 4:



HOOF GROWTH AND INTEGRITY RESEARCH

The effect of Zinpro Performance Minerals on hoof growth is shown in Figure 5. The increase in hoof growth observed early on in the experiment and retained when calculated over the entire trial suggests the higher bioavailability of ZMP works to affect hoof growth sooner, compared with feeding standard sulfates.

Additionally, research in lactating mares showed improved sole depth when Zinpro Performance Minerals were included in the diet (Figure 6). These results suggest that the greater utilization of Zinc, Manganese and Copper could help strengthen the sole, increasing its lifespan, and thereby reducing the natural turnover (or loss) of sole tissue (Warren, 2011).

Figure 5:

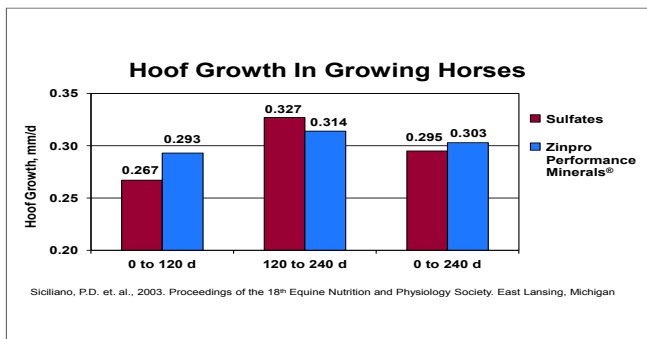
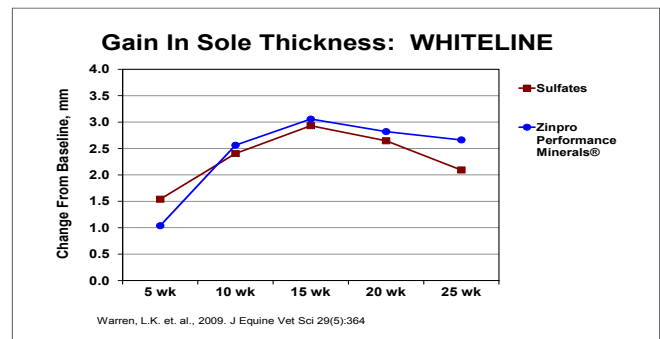


Figure 6:





GASTRIC ULCER RESEARCH

Non-glandular gastric ulcers pose a significant and widespread problem in the horse industry. While current grain feeding programs are often blamed for ulcer development in horses, stress may also be an important factor. In a study with 36 Thoroughbred horses during hot and humid environmental conditions, horses were fed either Zinpro Performance Minerals or the inorganic sulfate forms. All horses were treated at initiation of study with omeprazole paste (GastroGard®) for 14 days to heal any ulcers present and then subjected to alternate feed-deprivation from days 42 to 49. Results showed that the horses fed the

ZPM had lower gastric ulcer scores compared to those fed the inorganic forms (Figure 7), indicating that ZPM may be beneficial in preventing severity of gastric ulcers.

FIBER DIGESTIBILITY RESEARCH

Zinpro Performance Minerals also include Cobalt Glucoheptonate. Cobalt is utilized by cecal fermenting bacteria to digest forage and synthesize vitamin B12. A study in growing horses fed ZPM showed improved fiber digestion from the forage portion of the diet which ultimately translates to additional energy for optimal growth, performance or reproduction in the horse (Figure 8).

SUMMARY

Feeding horses diets containing the more bioavailable sources of trace minerals such as those provided by Zinpro Performance Minerals is a key way to increase mineral availability for absorption and ultimately improve trace mineral status in the animal.

Figure 7:

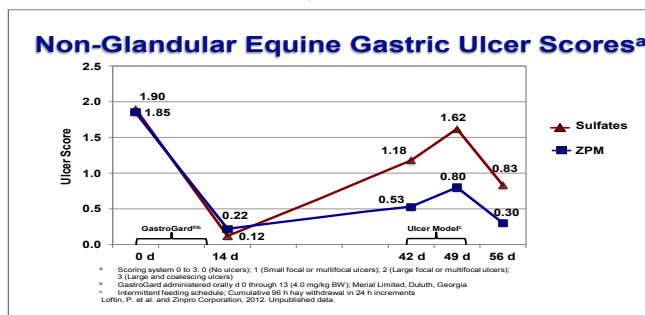
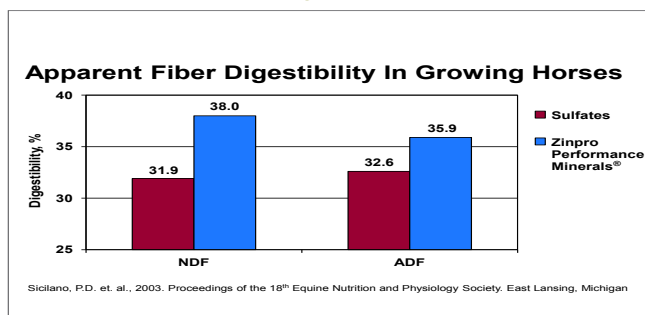


Figure 8:



Blue Seal and Kent Sentinel and Dynasty horse feeds are formulated with Zinpro Performance Minerals to provide for optimal health and performance by minimizing nutritional deficiencies. These trace minerals are listed on the tag as Zinc Amino Acid Complex, Manganese Amino Acid Complex, Copper Amino Acid Complex and Cobalt Glucoheptonate.

ZinPro Performance Minerals® is a registered trade mark of Zinpro Corporation, Eden Prairie, MN.
*Graphs were adapted from the Zinpro Training Manual: Equine Edition.

References

- Loftin, P. et al., 2012. American College of Veterinary Internal Medicine Forum. May 30-June 2, 2012.
- Warren, 2011. 2011 Equine Seminar, January 15-17, West Palm Beach, FL.
- Wedekind et al., 1992. J. Anim. Sci. 70:178-187.
- Zinpro Research Now, RN-E-001. July 23, 2012.
- Zinpro Technical Bulletin, TB-E-9001. September 17, 2004.
- Zinpro Training Manual: Equine Edition. Zinpro Corporation, Eden Prairie, MN.