

# Adams Advanced Nutrition, Inc.

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## Lameness IV...

### Trace Minerals & Claw Integrity

An area of nutrition that is commonly overlooked is the role of trace minerals in improving claw health, structural integrity and reducing the incidence of lameness.

**Iodine:** There have been several studies conducted that show a benefit of feeding iodine in the form of ethylenediamine dihydriodide (EDDI) in excess of the nutritional requirement to prevent foot rot (*Miller and Tillapaugh, 1967*). Only 8.3% of calves on pasture fed a salt mixture containing EDDI had foot rot, while 20.8% of calves receiving a salt mixture without EDDI had foot rot (*Maas et al., 1984*). When cattle were inoculated intradermally in the interdigital space with a mixture of *Fusobacterium necrophorum* and *Bacteriodes melaningenicus* to induce acute foot rot, cattle receiving 12.5 to 200 mg/animal/day of EDDI had less lameness than control cattle (*Berg, 1984*).

A series of studies addressing iodine supplementation have concluded (*Preston et al., 1993*): 1) iodine has direct antibacterial properties, but feeding this level would result in iodine toxicity in cattle; 2) serum iodine concentrations of 60-80 µg/dl are thought to be prophylactic; and 3) cellular immune response is improved by feeding EDDI and iodate.

The recommended dietary content of iodine for lactating dairy cattle ranges between 0.3-0.9 ppm, depending upon stage of the life cycle and dry matter intake (NRC, 2001). Soybean, rapeseed and canola increase the iodine requirement of the animal as they contain goitrogenic compounds that reduce the availability of iodine (NRC, 2001). High dietary nitrate also inhibits uptake of iodine by the animal (*Puls, 1994*). As a result, producers with high nitrate forage and/or water need to determine if their iodine supplementation level is adequate.

**Zinc:** Zinc is an essential component of numerous enzyme systems. The metabolic actions of these systems include carbohydrate and energy metabolism, protein synthesis, nucleic acid metabolism, epithelial tissue integrity, cell repair and division, and vitamin A transport and utilization (NRC, 2001). In addition, it plays a major role in the immune system and certain reproductive hormones (*Miller et al., 1988*).

It is thought that zinc improves claw integrity by speeding wound healing, increasing rate of epithelial tissue repair and maintaining cellular integrity (*Weaver et al., 1978*). Zinc is also required for the synthesis and maturation of keratin (*Mulling 1999 & 2000, Smart and Cymbaluk, 1997*). Several studies show that complexed zinc improves claw integrity. In a year-long study conducted at Illinois State University, cows fed complexed zinc had fewer cases of



heel cracks, interdigital dermatitis and laminitis than cows not fed complexed zinc (*Moore et al., 1989*). In addition, incidence of sole ulcers and white line disease tended to be reduced.

The required dietary content of zinc for dairy cattle ranges between 18-73 ppm, depending upon stage of the life cycle and level of production (NRC, 2001). On a ppm DM basis, the zinc requirement is highest

in early lactation. For instance, a cow milking 25 kg/d of milk requires 69 ppm of zinc in early lactation and 31 ppm in late lactation. Research at the University of Minnesota (*Olson*) reaffirms the need to increase dietary levels of zinc in early lactation since zinc content of the liver is lowest in early lactation. It should be noted that NRC (2001) requirements for zinc assume normal levels of stress and normal levels of antagonists. Dietary zinc levels for stressed cows or cows consuming diets high in copper, cadmium, calcium and/or iron should be increased (NRC, 2001). Similarly, researchers in Florida found that replacing inorganic zinc, copper, manganese and cobalt with similar amounts of these trace minerals from complexed sources resulted in a reduction in claw lesions (*Ballantine et al., 2002*).

### Summary

Locomotion scoring may serve as an early warning system for potential claw disorders. Animals should be scored and identified as candidates for corrective trimming on a routine basis, i.e. calving, breeding, dry-off, sorting and daily milking. Early identification, corrective trimming, attention to cow comfort, non-slip walking surfaces and insuring proper nutrition, including complexed trace minerals, can improve overall claw health and positively affect performance and profitability.

(For copies of the complete article contact the Renaissance Office. Edited from an article by Drs. Tomlinson & Socha, Zinpro Corporation)

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**RENAISSANCE... IMPROVING YOUR  
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# Invest in forage...



It's time to invest in maintaining quality forage for the coming fall and winter months. When you add up the cost of seed and chemical, plus your time – it is important to manage your silage for maximum results from planting and growing to harvesting and ensiling! Using a research-tested preservative or inoculant can help to make a quality difference in your forages. When applied as directed, these products can make good silage... better, while keeping poor silage from getting any worse. Have you considered the facts? I can provide you with information and advice, along with products that will make a valuable difference to your silage. Your cows can produce when they are fed quality forages... as part of a balanced ration and management program. Check it out! Invest today in quality forage that can produce results.

## KEMIN - BIOTAL

### COMBATTING HEAT STRESS AS SUMMER CONTINUES ~

Research has demonstrated that while fiber fermentation in the rumen produces heat, one of the keys to combating heat stress in dairy cows is maintenance of adequate ration fiber to prevent low rumen pH and consequent problems. This is particularly important given the potential for significant ration sorting and a preference for concentrate consumption under heat stress. Generating sufficient ration space to maintain the nutrient supply and fiber adequacy with the reduced intake during heat stress is a major challenge. Balancing amino acids and utilizing, where needed, a concentrated methionine source such as Mepron® can promote efficient use of ration nitrogen/protein and permit use of reduced protein rations. The ration space saved can be used to supply adequate fiber and other nutrients. This, along with good management can help you combat the impact of heat and humidity this summer and into the fall. Keep your cows cool in the heat and they will perform all summer long! *(edited from an article by Mr. Marvin Stevenson, Degussa)*

**A POINT TO PONDER...** Time flies! We are already into August, a time of year that is filled with local, county and state fairs. In bygone years, these were excellent community-oriented opportunities. Sadly, in many places these kinds of opportunities no longer exist and a sense of "community" is something of the past, which many of us remember fondly. Time for community activities is important in the scope of our personal, regional and national development and continuity. If you have an opportunity that promotes your community and our industry (agriculture), take time to support that activity. Let's all encourage a renewed sense of "community."



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## August...

*balancing between summer & fall ~  
getting ready for harvest ~  
dealing with lameness... and more.*

*Check it out.*