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## **LIPOIC ACID -- BENEFITS METABOLIC SYNDROME IN TWO WAYS**

Metabolic syndrome is a condition of insulin resistance that predominantly affects overweight horses. Some horses are genetically predisposed toward developing it, but it can occur in any horse that becomes obese. As insulin levels increase, the body is encouraged to store more fat. In addition, as insulin levels rise, the risk for laminitis increases. Losing body fat is your first line of defense. This is best accomplished by increasing physical activity as well as offering grass hay, free-choice, that is both low in non-structural carbohydrates (NSC) as well as calories. *(Do not restrict forage; this leads to a hormonal stress response that further enhances obesity and may lead to laminitis relapses.)*

### **Obesity causes inflammation and leads to elevated insulin**

Fat cells produce inflammatory molecules called cytokines, which disrupt normal insulin action. The more cytokines your horse produces, the more insulin resistant he becomes, leading to more fat storage, creating a vicious cycle.

Inflammation leads to the production of volatile, damaging molecules known as free radicals. Free radicals are missing an electron and will go on a rampage, literally destroying tissues in its path, to obtain what it needs, creating still more inflammation, disease, and a lessened ability to fight infections.

### **Antioxidants ease inflammation**

Antioxidants neutralize free radicals by giving up their own electrons. These protective nutrients are either produced by the body or can be provided in the diet. Common antioxidants include vitamins C, E, and beta carotene, all found in fresh, healthy grasses. In the case where the horse's body is experiencing high levels of inflammation (as with Metabolic Syndrome), the need for antioxidant supplementation becomes greater.

## Hoofcare Essentials®

### **Lipoic acid is a potent antioxidant**

One antioxidant of recent interest is lipoic acid. It is naturally produced throughout your horse's body and serves to protect his tissues from the damaging impact of free radicals. Some interesting facts:

- Lipoic acid has the ability to regenerate other antioxidants and make them active once again.
- The horse's diet is generally sufficient in lipoic acid because it is found in green plants. But once fresh grass is cut, dried, and stored as hay, it is lost through oxidation.
- Lipoic acid is both fat and water soluble. Therefore, it can work throughout the entire body, protecting all tissues.

### **Lipoic acid also lowers blood glucose and insulin levels**

In humans, lipoic acid has been determined to lower blood sugar levels. A recent study\* revealed the same benefit when lipoic acid was given to pony mares. Researchers administered 10 mg of lipoic acid per kg of body weight, mixed with maple syrup, to ponies receiving a grass hay diet. A control group was given the same maple syrup feeding, without lipoic acid. The ponies receiving the lipoic acid required less insulin to remove glucose from the blood. The researchers concluded that delivery of lipoic acid improves insulin effectiveness, thereby lowering blood glucose as well as circulating blood insulin levels.

### **Take a look at your supplement**

If you are feeding a supplement designed for the insulin resistant horse, it may contain lipoic acid. The synthetic form, alpha lipoic acid, is used in supplements (known as ALA, but not to be confused with the omega 3, alpha linolenic acid, also known as ALA). To add more to your horse's diet, you can feed it as a separate nutrient, or look for a supplement which includes ALA with other beneficial nutrients. For example, Carb X (Med Vet Pharmaceuticals) offers a concentrated level of lipoic acid as well as other important nutrients for the insulin resistant horse.

### **Summary**

There are many nutrients that benefit the insulin resistant horse. Antioxidants such as vitamins C and E, as well as grape seed extract, and herbs, will help ease the inflammation which results from too much body fat. Magnesium, chromium, and omega 3 fatty acids help lower circulating insulin levels. But lipoic does both – lessens the effect of inflammation as well as lowers blood glucose and insulin levels.

\* Berg, E., McNamara, D., and Keisler, D. 2011. Abstract: The effects of lipoic acid supplementation on blood glucose, insulin, and leptin concentrations in pony mares. *Journal of Equine Veterinary Science*, volume 31, 250-251.

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