

Use of omega rich seed oils reduce inflammation, improve immune and reproductive performance in horses

Amy M. Gill, PhD | www.amyngillphd.com

Horse owners, breeders and trainers are continuously searching for new ways to ensure their horses are healthy and performing well. New trends emerge, especially those related to nutrition, and with time and research, some of these contemporary concepts become accepted throughout the industry. For example, the once novel idea of utilizing fats along with grains as a more appropriate energy source for horses than grains alone is now widely accepted and the associated benefits are common knowledge. Including fat in the ration provides safe calories and there are a number of high fat feeds and supplements available on the market today. But not all fats are created equal. Can fats that are now often included in equine diets provide additional benefits in addition to adding calories? Studies in humans have indicated that the inclusion of omega-3 fatty acids in the diet are helpful in controlling high blood pressure, heart disease and ulcers and could potentially assist in the strengthening of a weak immune system. The impact of omega rich oils on the horse is under investigation and studies thus far have indicated improvements in general health, performance, immune function and reproductive function.

Explanation of Omegas & Sources

Both omega-3 and omega-6 fatty acids are essential fatty acids (EFA's). This means they are not produced within the body and, therefore, must be provided in the diet. EFA's can be found in varying concentrations within a number of sources. The best sources of omega-3s, or the sources with the highest concentrations, are fish oils and flaxseed oil. Corn, canola, cottonseed, and peanut oil contain some omega-3's but are much higher in omega-6 fatty acids.

Inflammatory Response

Inflammation is the body's response to injury or physical stress. Dilation of the blood vessels in the affected area increases blood flow in order to aid the healing process. The excess blood causes both the heat and swelling that serve as outward signs of inflamed tissue. Extended periods of inflammation can cause actual damage to the tissues involved, and therefore it is important to employ various techniques in an attempt to reduce or, if possible, prevent heat and swelling before they have a chance to occur. Horses in training undergo strenuous exercise on a routine basis. Working at such a physically demanding level will most often lead to a degree of inflammation, particularly of the joints and other structures within the leg. Leg boots and other equipment can be used to protect the limb during periods of exercise and methods of cooling and supporting the leg afterward, aid in the prevention of exercise induced inflammation. Omega-3 fatty acids also help reduce inflammation in the body by helping the body to produce compounds called prostaglandins which play a regulatory role in the inflammatory process.

Prostaglandins are responsible for functions such as:

- Reducing Pain
- Dilating or constricting blood vessels
- Maintaining the fluidity of cellular membranes
- Transporting oxygen from red blood cells to tissues
- Decreasing inflammation

All cells, including red blood cells, have a membrane that regulates movement of materials into and out of the cell. Omega-3 fatty acids help to make the membrane more permeable, which allows the nutrients to move into the cell and waste products to move out of the cell more easily. Research conducted at Texas A&M University indicated that horses fed oils higher in omega-3's demonstrated less inflammation following exercise. Another study conducted on the effect of docosahexaenoic acid (DHA) supplementation (an omega-3 fatty acid) on airway inflammation and exercise induced pulmonary hemorrhage (EIPH, a condition in which brief periods of demanding exercise result in bleeding in the lungs) at Kansas State University was inconclusive but is being repeated with a different combination of omega-3 fatty acids. Ratios and ideal levels of these fatty acids continue to be explored in the equine and should lead to a greater understanding of how supplementation could reduce damaging inflammation.

Other benefits of feeding supplemental EFA's include:

- An increase in strength and stamina, due to positive effects on the endocrine system producing the hormones and enzymes necessary for enhanced athletic performance. Normalization of hormone production and concentration
- Increased insulin sensitivity and efficiency, promoting the synthesis of muscle, and the ability of the cell to utilize nutrients efficiently
- Increased neurological sensitivity and innervations of muscle fibers, contributing to strength and twitch responsiveness.
- Improved ability to transport and utilize oxygen, hence improved stamina. Due to affinity of carbon chain of omega-3 fatty acids for oxygen
- Increased elasticity of connective tissue and bone density
- Recovery time from exercise and injury will be shortened because of the factors listed above and due to the enhanced immune system. The immune system is suppressed by intense exercise and plays an important role in recuperation. A suppressed immune system leads to over training, injury, and poor performance.
- Improved permeability of cellular membranes, allowing improved nutrient uptake and removal of toxic metabolites resulting from intense bouts of exercise

Feeding EFA's has also been shown to improve respiratory conditions and help accelerate the healing of quarter cracks and other skin and hoof disorders. Several studies have also shown improved quality of semen characteristics in stallions supplemented with omega-3 fatty acids. The addition of EFA's to the diet will help to not only keep horses healthier and performing well, but may contribute to reduced veterinary costs. ###