

How natural supplements can benefit the health of your horse -- popular supplements such as glucosamine and shark cartilage, and medicinal herbs such as ginseng, Echinacea and garlic. An inside look at quality controls, the regulatory framework which supports these products in Canada, and research that has been conducted on natural supplements in horses.

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Introduction

“Botanicals as medicine” is not a novel concept. For the entire breadth of human culture we have used plants as our major resource for health-promoting substances, and even in contemporary society plants still offer our most valuable reservoir of new drugs. What is relatively new, however, is the ready and largely uninformed access that the horse industry has to herbal products. Though not without its benefits, this herbal revolution has faded the line between “feed” and “drug”, and leaves both horse owners and veterinarians confused about the distinction between husbandry and health care. Fundamental issues of dose, efficacy, and safety are, at best, left to an educated guess and, at worst, completely ignored. Even for those wading through the scientific literature for basic and applied research, animal-based research on many herbs is difficult to come by, and research on herbs for horses is virtually non-existent.

Since 1997, research has been ongoing at the University of Guelph which has provided new information on the usefulness and safety of herbs for horses. This research has employed the “gold standard” of science – namely, the “blinded, placebo controlled” trial – to investigate how herbs can affect equine health. Information is now available on how Echinacea or ginseng can influence equine immunity. We also know about a potential use of flaxseed in treating Sweet Itch in horses, and we can begin to understand how herbal mixtures can help horses with arthritis or heaves. In addition, we know about a potential danger of feeding high doses of garlic

to horses. This growing body of research is arming horse people with previously unavailable tools for making educated choices about safe and effective use of herbs. This article will briefly describe some of this research, and will explain what the science means to you in the stable.

Echinacea and Ginseng – Do They Help to Increase Immune Function in Horses?

Two separate experiments were conducted to investigate what herbs can do to improve immune function in horses. The first was a look at Echinacea (O'Neill et al., 2002a). Four horses were supplemented with a standardized Echinacea extract (EchiFend™, Bioniche Botanicals) or placebo (USB sucrose solution) for 42 days. All horses then had a 2 week break before the groups were “crossed over” (i.e. horses receiving EchiFend™ in the first 42 days were switched to the placebo, and vice versa) and the experiment continued for another 42 days. Weekly blood samples were subjected to a full blood and biochemistry evaluation. In addition, special white blood cells called neutrophils were isolated from the blood samples, and were fed yeast particles to see if the cells were more able to consume these particles when they came from horses receiving Echinacea. Results from this experiment showed that Echinacea increased ability of neutrophils to consume the yeast particles. The ability of Echinacea to stimulate isolated neutrophils to consume foreign particles has been reported before (Melchart et al., 1995; Roesler et al., 1991), but this is the first time this result has been demonstrated in horses. An additional, unexpected, finding was that the Echinacea supplement also increased the concentration of red blood cells in the blood, which may have a beneficial effect on oxygen transport and subsequent exercise performance. The supplement was found to be safe, with no negative side effects identified in any of the blood analyses.

In a second study, the researchers wanted to look at the effect of low-dose Ginseng on antibody formation in healthy horses (Pearson et al., 2002b). In this experiment, five horses received ground ginseng (35mg ginseng per kg body weight per day; Rainey Ginseng Farms), and five received a placebo in their morning grain ration for 28 days. On Day 14 all horses were vaccinated with Rhinopneumonitis vaccine (Pneumabort-K® +1b). Blood was sampled on days 0, 7, 14, 15, 16, 17, 18, 19, 20, 21, and 28 and analyzed for antibodies that were raised against the vaccination. Blood was also monitored for changes in basic haematology and biochemistry in order to identify any possible side-effects. It was found that ginseng at this low dose did not result in a statistically significant increase in antibody produced to the vaccination, but antibody produced by horses receiving ginseng was higher on all but one of the days compared with placebo horses. Ginseng was found to be safe, with no side-effects identified by the blood screens. This experiment does provide some rationale for further research into its ability to influence antibody production. The future research should probably use a higher dose of ginseng on more than 10 horses to maximize the likelihood of results being statistically significant.

Herbal Mixtures for Managing “Heaves” in Horses

Respiratory disease is one of the most important health concerns facing the horse industry, and accounts for one of the biggest reasons why horses miss training days (Rossdale et al., 1985). “Heaves” is one of the more troublesome small airway diseases, which causes an elevated respiratory rate, chronic coughing and runny nose, and affected horses often find it difficult to exhale. In an experiment using six horses with heaves, investigators evaluated the ability of an herbal mixture (“Breathe”; Selected Bioproducts) (Table 1) to reduce symptoms of this chronic, debilitating disease. Horses were housed indoors under typical management conditions, half of them receiving Breathe (1/2 cup twice daily) and the other half receiving placebo (equal weight of chopped alfalfa) for 3 weeks. Similar to the Echinacea study described above, after the 3 weeks horses were given a 2 week break and were then “crossed over” and fed their supplements for another 3 weeks. A “ventigraph” was used once a week to very accurately measure the horses’ respiratory rate, and the effort required for them to breath. And, like the other experiments already described, blood was also analyzed for changes in basic hematology and biochemistry to identify any possible side-effects.

Table 1: Composition of “Breathe” herbal supplement

Common Name	Botanical Name
Garlic	Allium sativum
Boneset	Eupatorium perfoliatum
White Horehound	Marrubium vulgare
Black Elder	Sambucus nigra
Hyssop	Hyssopus officinalis

Results of this experiment demonstrated that when horses were receiving the herbal supplement, there was a significant decline in respiratory rate compared with when they were receiving the placebo. The difference between herbs and placebo was statistically significant after one week, and remained for the remainder of the experiment. The product was found to be safe, with no adverse effects were evident through the blood screens.

These results demonstrate that this herbal mixture can be used to treat symptoms of chronic equine respiratory disease. Respiratory disease is a major concern in performance horses, and intensive research has not yet been able to find a cure for heaves. Herbs have been used with some success in treating chronic respiratory disease in horses (Sommer et al., 1986) and other species (Aqel 1991), and this research provides additional support for this application. An increase in respiratory rate is a fundamental symptom of COPD caused by combination of constricted airways, accumulated mucous, and smooth muscle spasms. A reduction of the resting respiratory rate may reflect improvement in any one or combination of these factors.

Further research is required to discover the mechanism by which “Breathe” was able to reduce the respiratory rate in these horses.

Managing Arthritis with Herbs

Any of us who are a little longer in the tooth that we used to be will understand the pain and discomfort of arthritis. Horses are even more prone to arthritis than humans, many of them developing the disease by the tender age of 3. An experiment was designed to evaluate the ability of an herbal mixture (“Mobility”, Selected Bioproducts) (Table 2) on six horses with naturally occurring osteoarthritis (Pearson et al., 1999). Three horses were supplemented with Mobility (1/2 cup twice daily) or placebo (equal weight of chopped alfalfa) for 28 days in a cross-over manner with a 2 week washout in between. Synovial fluid was collected from the horses’ arthritic joints and the corresponding opposite joint three times over the 4 week experiment, and was analyzed for GAGs (the building blocks of cartilage), hyaluronic acid (a dense, slippery compound that gives synovial fluid its slippery texture) and prostaglandin E2 (a compound that is involved in the horse’s perception of pain – in fact, phenylbutazone works by blocking the production of this compound). In addition to synovial fluid, blood was sampled three times over the 4 weeks and was analyzed for complete blood and biochemistry screens.

Table 2: Composition of “Mobility” herbal supplement

Common Name	Botanical Name
Dandelion	<i>Taraxacum officinalis</i>
Devil’s Claw	<i>Harpagophytum procumbens</i>
Comfrey	<i>Symphytum officinalis</i>
Burdock	<i>Arctium lappa</i>
Stinging Nettle	<i>Urtica dioica</i>

Treatment of osteoarthritic horses with Mobility resulted in a reduced synovial fluid concentration of PGE2 that was statistically significant. And the product was found to be safe, with no adverse effects identified through the blood tests. These data suggest that herbs are able to reduce PGE2 production in arthritic horses, as has been shown in other species (Lanhers et al., 1992).

Another interesting herb for possible use in arthritis horses is *Mentha spicata* (mint). Our laboratory has conducted research evaluating the ability of this plant to inhibit inflammation in cartilage explants and in horses with mild articular inflammation. Simulated digest of *Mentha spicata* markedly reduces PGE2 and nitric oxide production, and reduces breakdown of cartilage tissue (Pearson et al. unpublished).

Herbs for Treating Chronic Allergic Skin Disease

Recurrent Seasonal Pruritus, or “Sweet Itch” as it is more commonly known, is a chronic allergic skin disease suffered by a huge number of horses across many different regions of the world. An allergy to the bite of the very common “Culicoides” insect, causes dry itchy patches of skin that horses will constantly rub on fence posts or stall doors in an effort to alleviate the itching. They will often develop raw, painful patches from the constant itching, not to mention the many fence boards they break in the process! An experiment was designed to test the ability of flaxseed (Pizzey’s Milling and Baking Company) to reduce the symptoms of sweet itch in horses with an allergy to Culicoides. Three horses were supplemented with flaxseed (1 lb/1000 lb BW/day) and three more received an equal weight of placebo (wheat bran) for 42 days in a cross-over manner with a 2 week washout in between. Three times over the 42 days, all horses received a skin test challenge with a serum made from Culicoides insects. This was much like a TB test that we would have in a clinic – the serum was injected just below the skin and the reaction to it was measured with respect to area and heat. Blood was also sampled for assessment of changes in basic haematology and biochemistry.

Flaxseed supplementation resulted in a significant reduction in the size of the reaction caused by injection of the insect serum (O’Neill et al., 2002c), and the seeds were found to be safe, with no side effects identified through the weekly blood tests. So this demonstrates that botanicals can also play a role in the treatment of symptoms of dermatitis in horses. There may also be some additional benefit from increasing the amount of omega 3 fatty acids that are found in flaxseed in the horse’s diet – this would have to be a question for further research into flax for horses.

Does Natural = Safe? Potential Toxicity of Garlic in Horses

Though data do suggest that botanicals can be safely used to maintain health and treat disease, the news is not all good. It was stated by Paracelsus in the early 1500s that the only difference between a medicine and a poison is the dose. The common adage that natural is synonymous with safe has led to significant and widespread disease (Pearson 2000), and it is critical that those involved in caring for horses are aware of the potential dangers of herbal medicine. In an attempt to look at the safety of a common herb, an experiment was conducted to determine the safety of garlic in horses that were fed as much of the bulb as they would happily eat (Pearson et al., 2005). Two horses were supplemented with freeze-dried garlic (*Allium sativum*; Freeman Farms), mixed with molasses as part of their normal grain ration. The dose began at a quarter cup twice daily, and it was gradually increased until the horses refused to eat any more – the maximum dose was about 5 cups per day. Two control horses received only molasses in their grain. Blood was sampled weekly for changes in basic haematology and biochemistry, and for evidence of oxidative damage to red blood cells (Heinz bodies). The horses received their supplement for a total of 71 days, after which they were monitored for a further five weeks to see how long it took for the horses’ blood parameters to return to what they

were prior to beginning garlic supplements.

Supplementation with garlic at maximum voluntary intake for 71 days caused quite severe anaemia in horses, which was identified by reductions in red blood cell count, haemoglobin, and concentration of red cells in the blood, and by increases in bilirubin (breakdown product of red cell degeneration), the size of the red cells (meaning they were immature cells), and most importantly, in the incidence of Heinz bodies. Heinz bodies are little denatured clumps of haemoglobin within red cells which often cause the cells to break and die. It took about 4 weeks for the horses to recover from the garlic-induced anemia.

Conclusions

The series of experiments described above demonstrates that herbs have the potential to help horse people in their quest for improving or maintaining the health of their horses. Echinacea, and possibly ginseng, can improve immune function and protect horses from immune challenges. Herbal mixtures, such as Breathe and Mobility, have shown an ability to reduce symptoms associated with respiratory disease and arthritis. And people with horses suffering from sweet itch now have flaxseed as a proven method of reducing the discomfort of this disease. However, natural is not synonymous with safe, and horses can voluntarily consume enough garlic to cause Heinz body anaemia which can take more than a month for the horse to recover from. The key to maximizing the benefit of botanicals for horses is to encourage a continued effort in science to conduct horse-specific research on potentially important plants and plant mixtures, and to make this information readily available to those involved in the husbandry and health care of horses.

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