

SUPPLEMENT TO HOLISTIC HORSEKEEPING (Updated in 2023)

I published the original Holistic Horsekeeping book in 2006. In reading through the original book I realized how much has changed in the last 15 years. The main changes have been in the area of nutrition, but dentistry, deworming practices and laminitis treatment have also changed significantly.

For years I have been shouting from the roof tops about the importance of healthy gut bacteria, and now this subject is getting the attention it deserves. We are just scratching the surface on the importance of the microbiome and the gut/brain connection. Many of the supplements I currently use address all manner of health issues from the concept of promoting a healthy microbiome.

With the legalization of hemp, we are understanding so much more about the endocannabinoid system. This knowledge ties in with the discussion of PolyVagal theory. These are two areas that need more attention. I am sharing what I have learned in this supplement to my original book.

Last, but not least, I believe horse care is improving overall. We have better diagnostic techniques for lameness and many more choices for regenerative treatments. Organic feeds are becoming more available as well as organic hay. More owners are choosing to keep their horses barefoot, and many styles of boots have been developed. Saddle design is better, and professional saddle fitters are able to help a person get the best saddle for their horse.

Temperament typing is being used to help match the best horse with the person and with the discipline. Be sure and read my book, *Horse Harmony* and check out the many blog posts on the subject on my Holistic Horsekeeping blog.

Ex race horses can be placed in good homes thanks to many rescue organizations. More horsemanship clinicians are exploring the benefits

of building good relationships with horses in addition to exercises and techniques for training.

On the other hand, the world pandemic has brought more stress to people, and the horses feel this. As we all heal from the effects of the pandemic we want to offer extra appreciation to our equine friends who have helped us so much.

Following are the main differences to be aware of between my original book and this edition.

CHAPTER ONE is an introduction to holistic medicine. I added a whole section on the endocannabinoid system and hemp oil to this chapter.

The Endocannabinoid System and Hemp Oil

We all know that our body has many components, such as the nervous system, the immune system, hormonal and digestive system and so on. And it would make logical sense to believe that science had already fully mapped out all of these systems a long time ago.

Well, surprise, because in the last decade, research by hundreds of scientists around the world has verified that we humans do, in fact, have another additional system, a hidden receptor system that controls some of the most vital functions of our body. It is called the Cannabinoid Receptor System.

The Cannabinoid Receptor System is made up of millions of receptors that are located in the brain, the spine, and in large amounts in the uterus and many other organs. And it affects so many important aspects of our health that it's hard to list them all.

Animals have the same system!

This receptor system affects how the brain works—including brain plasticity, better decision-making, memory, depression, anxiety, the strength of immunity, hormones, the lessening of pain, and better sleep patterns.

Just think about how many horses and people could be helped by supporting this system.

The single most effective way to feed this cannabinoid system is with

hemp oil. Hemp oil contains the highest amount of cannabidiol, by far, of anything else in the entire plant kingdom. And this single compound, CBD, has the biggest impact on this hidden receptor system.

When talking about hemp oil, it's really important to clear up a very harmful misconception that's been around for about 70 years: that it can make you high. You cannot get high or stoned from hemp oil, even a little bit. No matter how much you take. Instead, hemp oil just makes you healthier.

The really good news is that after decades of really foolish laws, hemp oil can now be legally used and legally shipped to all 50 states in the United States.

Here is what you need to understand.

Hemp verses Marijuana

“*Cannabis*” refers to plants that are further defined as either “hemp” or “marijuana,” depending on their $\Delta 9$ -tetrahydrocannabinol (THC) concentration. Cannabis refers to any form of the plant for which the THC concentration on a dry weight basis has not yet been determined prior to further categorization as hemp or marijuana.

“*Marijuana*” is defined as cannabis that has a THC concentration exceeding 0.3 percent.

“*Hemp*” is defined in the 2018 Farm Bill as the plant species *Cannabis sativa* L. and any part of that plant, including the seeds and all derivatives, extracts, cannabinoids, isomers, acids, salts, and salts of isomers, whether growing or not, with a $\Delta 9$ -tetrahydrocannabinol concentration of not more than 0.3 percent on a dry weight basis.

It is important to note that hemp oil is referring to oil derived from the flower part of the hemp plant. Hemp *seed* oil has wonderful nutritional value but does not contain any cannabinoids.

How do you choose the best hemp oil out there?

Question One to ask is if a product is only CBD (cannabidiol), broad spectrum, or full spectrum.

CBD oil can act like a drug. Without the other components of the hemp plant you get the concentrated effects of CBD for anti-anxiety, pain relief and lower inflammation. This effect, like a drug, begins rapidly after ingestion and declines within a few hours.

Broad-spectrum products contain multiple cannabinoids as well as

many of the beneficial terpenes contained in the whole plant. Broad-spectrum products should not contain any THC. These products will have a deeper and longer acting effect as they work more gradually to balance the endocannabinoid system. Repeated low- or even micro-dosing of a broad- spectrum hemp product can allow the body to change long-held patterns in the nervous system by increasing neuroplasticity. What this means is that when the endocannabinoid system is fully functioning the brain can rewire neural pathways. Certain cannabinoids, such as cannabigerol (CBG) are especially powerful for healing the brain and nervous system.

Full-spectrum products contain multiple cannabinoids, terpenes and low levels of THC. These products can be used for treating seizures when broad-spectrum products have failed to give control.

Question Two should be how well the product will be absorbed. In fact, if you look at the absorption of all cannabinoids in hemp, they all have a similar absorption, and that is around 10%. There's a range, from 3% to 20%, but you'll see that all the studies show that the standard absorption averages around 10%, so products can be processed to improve absorption.

Liposomal sonification is the technology that makes the CBD molecules so small that those molecules are able to get into the bloodstream very effectively. Bio-availability means that you can have a product that has 1000 milligrams of something, say calcium or vitamin D, but if only 100 milligrams—10%!— gets absorbed, that means that only 10% of it is bio-available. And 90% of it is just being wasted and passed through our body.

Hemp products that are processed using liposomal nanotechnology will be absorbed through the mucous membranes in the mouth, so will enter the bloodstream almost instantly. This kind of product is valuable for nervous system healing and chronic pain. Low-level or micro- dosing over time will allow for deep healing of the brain. Liposomal products can also treat acute pain and inflammation, but higher doses are needed. You can also apply liposomal hemp oil topically on painful areas, including muscle trigger points.

Hemp oil can have a powerful healing effect in the gut. In this case you would not want to choose a liposomal product because you want the oil to enter the gut rather than be absorbed immediately in the mouth.

Once the hemp oil reaches the gut it lowers inflammation and aids in healing. If you are wanting immune system support you want a non-liposomal product because so much of the immune system actually resides in special areas in the gut.

Cannabinoids

Cannabinoids are naturally occurring compounds found in the *Cannabis sativa* plant. Of the over 480 different compounds present in the plant, only around 66 are termed cannabinoids.

Differences Between Cannabinoids

The main way in which the cannabinoids are differentiated is based on their psychoactive effect. For example, CBG, CBC and CBD are not known to be psychoactive agents, whereas THC, CBN, and CBDL, along with some other cannabinoids, are known to have varying degrees of psychoactive effects.

Classes of cannabinoids

The cannabinoids are separated into the following subclasses:

Cannabigerol (CBG)

Cannabichromene (CBC)

Cannabidiol (CBD)

Tetrahydrocannabinol (THC)

Cannabinol (CBN)

Cannabinodiol (CBDL)

Other cannabinoids include cannabicyclol (CBL), cannabielsoin (CBE) and cannabitriol (CBT)

CBD (Cannabidiol)

Non-psychoactive (does not induce a euphoric high)

Counteracts psychoactive effects of THC

Calming effect helpful for anxiety and sleep loss

Lowers blood sugar

Demonstrates promise in treating pain, inflammation stress, and epilepsy

CBDV (Cannabidivarin)

Non-psychoactive (does not induce a euphoric high)
Demonstrates promise in treating seizures

CBG (Cannabigerol)

CBG has been found to act on very specific physiological systems and problems, and results for medicinal use are promising:

Endocannabinoid receptors are prevalent in eye structures, and interestingly, CBG is thought to be particularly effective in treating glaucoma because it reduces intraocular pressure. It is a powerful vasodilator and has neuro protective effects.

In animal experiments involving mice, CBG was found to be effective in decreasing the inflammation characteristic of inflammatory bowel disease.

In a 2015 study, CBG was shown to protect neurons in mice with Huntington's disease which is characterized by nerve cell degeneration in the brain.

CBG is showing great promise as a cancer fighter. Specifically, CBG was shown to block receptors that cause cancer cell growth. In one such study, it was shown to inhibit the growth of colorectal cancer cells in mice, thereby slowing colon cancer growth. CBG inhibited tumors and chemically-induced colon carcinogenesis, therefore demonstrating a very exciting possibility for a cure for colorectal cancer.

European research shows evidence that CBG is an effective antibacterial agent, particularly against methicillin-resistant *Staphylococcus aureus* (MRSA) microbial strains resistant to several classes of drugs.

In a 2017 study, researchers showed that a form of CBG purified to remove delta-9 THC was a very effective appetite stimulant in rats. This may lead to a novel non-psychoactive therapeutic option for cachexia, the muscle wasting and severe weight loss seen in late-stage cancer and other diseases.

In a study that looked at the effects of five different cannabinoids on bladder contractions, CBG tested best at inhibiting muscle contractions, so it may be a future tool in preventing bladder dysfunction disorders.

Scientists are excited about these initial CBG results and are promoting future research with CBG alone or CBG in combination with

other cannabinoids and therapies for the treatment of multiple maladies. Because it is non-psychoactive, CBG has a promising wide range of potential applications not only for the problems mentioned above, but also as an analgesic, therapy for psoriasis, and as an antidepressant.

CBN (Cannabinol)

CBN offers a unique profile of effects and benefits. So far, CBN's studied benefits include:

- Pain relief
- Anti-insomnia
- Promoting growth of bone cells
- Antibacterial effects
- Anti-inflammatory activity
- Anti-convulsive effects
- Appetite stimulant

CBN's most pronounced, characterizing attribute is its sedative effect.

Unlike THC, CBN induces little-to-no intoxicating effects. Most flowers contain only trace amounts of CBN. Where THC contents can hit a high watermark of over 30%, CBN rarely exceeds 1% in the dried flower.

Terpenes are a group of fragrant essential oils that contribute to the complex aroma of cannabis. They are also generally responsible for many of the distinguishing characteristics of different strains. Though cannabis contains up to 200 different terpenes, there are about 10 primary terpenes that occur in significant concentrations.

Limonene is an aromatic cannabis terpene produced in the flower's resin glands. In isolation, it is commonly associated with fruity, citrus aromas, and is found in many everyday items like fruit rinds, cosmetics, and cleaning products. Studies on limonene so far have shown potential in the following applications:

- Elevated mood
- Stress relief
- Anti-fungal properties

Antibacterial properties

Relief of heartburn and gastric reflux

Improved absorption of other terpenes and chemicals by way of the skin, mucous membranes, and digestive tract

Humulene naturally occurs in clove, basil, hops, and cannabis sativa. Though cannabis is commonly associated with appetite stimulation, humulene is actually known to suppress hunger. Humulene's other potential effects include:

Antibacterial

Anti-inflammatory

Anti-tumor

Pharmacokinetic

Caryophyllene (or β -Caryophyllene) is a spicy, peppery terpene found in many different edible plants. Spices like black pepper cloves and cinnamon, as well as herbs like oregano, basil, hops, and rosemary, are known to exhibit high concentrations of caryophyllene. Due to its affinity to the peripheral CB2 receptors, caryophyllene often appears in anti-inflammatory topicals and salves. Caryophyllene has the following potential medical benefits:

Anti-inflammatory and analgesic

Anti-cancer

Anti-anxiety and anti-depressant

Geraniol (also known as lemonol) is most famous for its presence in geraniums, where it helps shape the blossoms' distinctive, delicate scent. It is found in a wide range of plants including tobacco and lemons, and is produced by honey bees as a means of marking their hives and flowers. Potential medical benefits attributed to geraniol include:

Antioxidant

Anti-tumor

Neuro protectant

Antibacterial

Anti-fungal

Anti-viral

Anti-spasmodic

Terpinolene is characterized by a fresh, piney, floral, herbal, and occasionally citrusy aroma and flavor. It is found in a variety of other pleasantly-fragrant plants including nutmeg, tea tree, conifers, apples, cumin, and lilacs, and is sometimes used in soaps, perfumes, and lotions. Terpinolene's potential medical benefits include:

- Anticancer
- Antioxidant
- Sedative
- Antibacterial
- Anti-fungal

Myrcene (or β -myrcene) is a terpene that occurs often in highly fragrant plants and herbs such as mangoes, hops, bay laurel leaves, thyme, lemongrass, and basil. Myrcene is produced by numerous cannabis strains, and some rodent model studies have suggested that it might lend sedative effects. Myrcene's Effects and Benefits:

- Anti-inflammatory
- Analgesic (pain relief)
- Antibiotic
- Sedative
- Anti mutagenic

Linalool is a naturally occurring terpene found in many flowers and spices including lavender and coriander. It gives off a complex yet delicate floral aroma, and while its effects are myriad, it is in particular one of the substances used most widely to reduce stress.

Humans have inhaled the scent of certain plants, including many containing linalool, since ancient times to help lower stress levels, fight inflammation, and combat depression.

Linalool's Effects and Benefits:

- Anti-anxiety
- Antidepressant
- Sedative
- Anti-inflammatory
- Anti-epileptic
- Analgesic

Delivery Systems for Hemp

Full Spectrum Oil: Full spectrum oil includes all the naturally occurring components of the hemp flower/bud.

Broad Spectrum Oil: Broad Spectrum oil contains many, but not all, of the naturally occurring components of the hemp flower/bud.

Isolates: An isolate contains a single component of the hemp flower/bud. CBD oil is available as an isolate.

Hemp/Herbal combinations: Hemp oil can be combined with herbs or nutraceuticals to promote a specific benefit.

Topical: Hemp oil can be applied topically by itself or in combination with other beneficial compounds.

Liposomal formulas: Hemp oil can be difficult for the body to assimilate. Treating the oil with a process known as liposomal sonification breaks down the size of the fat particles to enhance absorption. With this process the oil is absorbed in the beginning portion of the digestive tract and does not have a direct action in the gut.

Take the time to learn what you are wanting to achieve with your hemp product and make an informed decision on which product is best for your horse.

CHAPTER TWO explains alternative healing modalities. No changes here.

CHAPTER THREE is on nutrition, and many changes and additions have been made to accommodate all the new knowledge and products. In the original book I talk mostly about whole grains, such as oats, corn and barley. I preferred whole grains to the majority of formulated feeds available at that time. I talked about Purina Senior and Ultium, as these were the first products that had higher fiber content and added

antioxidants to help older horses. These feeds are still available and there are now many other options of equal or better quality.

My biggest concern now is the amount of chemicals that are applied to our crops. Genetically Modified (GMO) foods can be drought resistant but in some cases this characteristic also makes the feed derived from the crop less digestible. I am not saying all genetic modification is bad, but we don't really know all the effects.

GMO modification allows for stronger chemicals, such as glyphosate, to be applied to many crops. Glyphosate is even applied now to Round Up Ready alfalfa. Alfalfa has always been a good choice for many horses, but now I don't suggest it unless it is organic. Glyphosate is not harmful directly to mammals, but it is devastating to intestinal microorganisms. Horses, even more than people, depend on a diverse and healthy microbiome to digest their food.

Heavy application of inorganic fertilizers and other chemicals has affected the diversity of microorganisms in the soil. Just as horses need microorganisms in the gut to properly assimilate nutrients, plants need healthy microorganisms to uptake nutrients. Soil that is basically sterile from chemical applications grows plants that are high in calories but low in minerals. When these feeds are eaten by horses we see the horses gain weight but suffer from mineral deficiencies that affect their immune systems and metabolism. Whole-food supplements are needed to make up for these deficiencies.

Blue-green algae is one of the best whole-food supplements I have found, but not just any algae because not all algae products are safe. In the case of New Earth blue-green algae, which I take and offer to customers, I have absolute faith in the safety of these products that is backed up with a list of accreditations such as being registered by NSF International and the FDA's GMPs (Good Manufacturing Practices). New Earth goes the extra mile in safety by attaining certifications for their products of Certified Kosher, Certified Halal, USDA-Certified Organic, NSF GMP-Registered, and GMP for Sports TM-Registered. GMP registration is the gold standard of the food industry and assures

that every New Earth product contains exactly what it says it does on the label.

The increase in horses with metabolic conditions (Insulin Resistance) has moved the feed industry to produce more high-fiber, low-calorie feeds. In reality, only horses in heavy training or breeding need grains of any kind. What horses do need are whole-food based supplements to provide nutrients no longer found in our GMO crops. More people are choosing hay pellets or cubes to carry supplements for these horses.

The challenge with Insulin Resistant (IR) horses is that they love to eat but they tend toward very slow metabolism so what they eat converts to fat instead of being burned off as energy. All the extra carbohydrates consumed by IR horses that are not burned as energy or laid down as fat are consumed by sugar-loving gut microbes. These sugar-consuming microbes are tougher than beneficial fiber-digesting bacteria so the balance is upset. A toxic gut develops when the sugar-digesting microbes overgrow and produce waste products. These toxic products put extra stress on the liver and immune system. I like mushroom-based products to help rebalance the gut bacteria and improve over-all digestion.

The bottom line for supporting your IR horse involves a combination of feeding low-calorie, low-iron hay at a rate of 2% of his body weight, balancing the diet so that there are adequate amounts of copper and zinc to support carbohydrate metabolism, providing exercise to build more muscle than fat, fitting a muzzle so your horse can be out some on pasture, providing nutrients to encourage good carbohydrate metabolism such as CoQ10, wheat sprouts for antioxidants, mushroom-based products for liver support and gut detoxification, encouraging circulation with Nitric oxide-based supplements, plus meeting the other individual needs of your horse. If this all sounds like a full-time job, it can be.

Beware of weeds! Some pastures can look barren, but closer examination shows sprigs of green weeds. Your best efforts to dry lot your horses can also fail if weeds are taking the place of grass. Most weeds are harmless for a normal horse, but IR horses can get too many

calories from them. Weeds can also be very high in iron which is not ideal for the IR horse. Using a muzzle will also slow down weed consumption.

Fat is now the nutrient of choice if a horse needs extra calories. Fat does not trigger metabolic problems in the same way that high-carbohydrate grains do. Rice bran is a good fat source but it needs to be stabilized to prevent its becoming rancid. Wheat bran is also a good source of extra calories for non-metabolic horses, but it should be organic. For many years I fed wheat bran and wheat bran mashes to my horses, but I now choose to use organic hay-pellet mashes to avoid the calories and possible chemical contamination.

Beet pulp is another grain substitute but it should be organic. Beet pulp, by dry weight, has similar calorie content to oats but because it is digested as fiber in the large intestine, it does not cause insulin spikes. Beet pulp should be soaked for at least 15 minutes before it is fed.

In the original version of Holistic Horsekeeping I talk about individual nutrients like Vitamin C, Q10 and Super Oxide Dismutase. I have now learned which whole foods contain these nutrients and I prefer to feed the whole food version. For instance, rose hips are high in Vitamin C, so I prefer to feed them instead of Vitamin C.

I have found that supplements containing medicinal mushrooms contain a wide range of nutrients so I use these to compliment the foundational nutrition found in blue-green algae. I believe enough in the power of medicinal mushrooms to include a special section about them.

Antrodia Camphorata - This native Taiwanese mushroom is best known for its high levels and diversity of triterpenoid compounds. The triterpenes are highest in the fruiting bodies and lower in the mycelial portion. These compounds provide strong antioxidant, immune modulation, anti-inflammatory and vasodilation activity. This mushroom gives support for liver and kidney function and is a gentle liver detoxifier.

Chaga - Common names, Birch mushroom, Clinker polypore. This mushroom has a neutral thermal nature and a sweet and mildly bitter flavor. Its properties include support for the nervous system and emotional balance. It has anti-tumor activity, neutralizes toxins, relieves pain, improves appetite, modulates blood sugar and stimulates the immune system. It is also a liver tonic and blood purifier. Chaga contains a wide variety of triterpenes.

Cordyceps - Common names, Cordyceps, Caterpillar fungus. Cordyceps has a neutral to slightly warm thermal nature and a sweet flavor. It promotes an over-all sense of well-being with its ability to help ease stress and anxiety. It helps clear phlegm from the lungs and respiratory system, supports the kidneys and immune system, stops bleeding, lowers cholesterol, decreases fatigue, helps with the metabolism of lactic acid, and supports the heart. Cordyceps is a potent antioxidant and is high in amino acids, glutamic acid, unsaturated fatty acids, Vitamin B12, superoxide dismutase, and Beta glucans.

Coriolus - Common name is Turkey Tail. This mushroom is slightly warm with a sweet flavor. It helps clear dampness from the body and clears phlegm from the respiratory tract. It is a liver and kidney tonic, stimulates the immune system, and helps with muscle regeneration. Turkey Tail has antibacterial, antiviral and anti-tumor properties. It is also a potent antioxidant and is high in polysaccharides and Beta glucan.

Heridium Erinaceus - Common name is Lion's Mane. Lion's Mane is neuro-protective for nerve bundles and myelin sheaths and stimulates synthesis of Nerve Growth Factor (NGF).

Himematsutake - Common names, Royal Sun Agaricus, King Agaricus, Mushroom of God, Sun Mushroom, Mushroom of Life. This mushroom has a neutral nature and a mildly sweet flavor. Its properties include support for the immune system, liver balancing, nervous system support, modulation of blood sugar, lowering of cholesterol, and lowering of blood pressure. It also has antibacterial and antiviral properties, protects against cancer, and enhances tumor regression. Agaricus contains high levels of protein, carbohydrates, and digestive

enzymes.

Maitake - Common names, Hen of the Woods, Cloud Mushroom, Sheep's Head. Maitake has a neutral thermal nature and a bland to slightly sweet flavor. It supports the stomach and intestines, strengthens the liver and heart, supports emotional health, suppresses weight gain and modulates blood sugar. It has antiviral, antibacterial, anti-cancer and anti-candida properties. It is a strong antioxidant and contains polysaccharides.

Poria - Common names, Indian Bread, Tuckahoe, China Root, Hoelen. Poria is neutral in thermal nature and has a bland to sweet taste. It supports the spleen and stomach, dispels dampness, balances the emotions and lowers blood sugar. It also acts as a diuretic to promote urination and promotes secretion of Na, K and Cl ions. Poria contains triterpenic acids, polysaccharides, potassium, lipids, ergosterol, lecithin, amino acids and protease enzymes.

Reishi - Common names, Mushroom of Immortality, Spirit Plant, Phantom Mushroom. This mushroom is neutral to slightly warm in thermal nature and has a sweet to mildly bitter flavor. Reishi strengthens the heart, liver, kidney, lungs and spleen. It elevates the mood, supports the immune system, promotes sleep, modulates blood sugar and oxygenates the blood. It is a strong antioxidant and is anti-arthritic. Reishi is considered an adaptogen, which makes it especially indicated in chronic disease. It contains triterpenes and polysaccharides, including Beta glucans, ergosterol, amino acids, enzymes, lipids, carbohydrates, volatile oils, trace minerals and vitamins.

Shitake - Common names, Flower Mushroom, Winter Mushroom, Chinese Black Mushroom. Shitake is neutral in thermal nature and has a sweet flavor. It strengthens the stomach, intestines, and kidneys, fortifies bone, supports the immune system, builds the blood, detoxifies the liver, and modulates blood sugar. Shitake is antiviral, antibacterial, anti-fungal, anti-parasitic and anti-tumor. It contains polysaccharides, including Beta glucans, amino acids, vitamins, minerals and choline.

I research these products very carefully and offer products from companies I trust at www.holistichorsekeeping.com.

In the original book I talk about vegetable oils, but I rarely use these now. For simple calories I like rice bran, and for healthy levels of omega 3 fatty acids I use chia seeds and, in some cases, flax seeds. Green grass is the best source of omega 3 fatty acids, but many horses do not have access to grass. Blue-green algae provides these omega 3 fatty acids along with the seeds. A good quality fish oil can also be used. I offer one I trust on my website.

We have a much better understanding now of how to feed horses that gain weight due to metabolic issues. We have learned to look at feeds that do not cause rapid rises in glucose in the bloodstream. If too much glucose hits the blood, it triggers insulin release so the glucose can be moved into the cells. If the glucose continues to rise, the cells stop responding to the insulin and you have a condition called insulin resistance. High insulin levels can lead to serious effects such as laminitis.

Insulin resistant horses do not respond to simple calorie restriction. These horses need a tightly controlled diet that provides the calories they need in a form that does not trigger insulin release. They also need their minerals to not only be sufficient but also balanced. Insulin resistance can be managed, and many of these horses will eventually be able to eat a less rigid diet if the underlying condition is addressed. I have found that combining diet, supplements, and homeopathic treatment can help these horses live a normal life.

Since I wrote the original book, there has been much more understanding of what sugars affect insulin and what sugars cause laminitis without affecting insulin. The best way to know what sugars are in your feeds are to have them analyzed if this information is not provided. Equi-Analytical is the lab I use, and I ask for the trainer test which also provides the needed information about trace mineral levels. You need to look at sugar and starch levels if you are concerned about insulin resistance. Ethanol soluble carbohydrate (ESC) is the test you

want to measure simple sugars. This reading added with the reading for starch should total less than 10% to be safe for a horse with insulin resistance. Fructan levels are a concern in horses that have laminitis for reasons other than insulin resistance. If you are grazing a horse with insulin resistance, you want to turn out in the early morning after the sugars in the grass have dissipated overnight. But if the temperatures are very cool overnight, the sugars may still be too high for an insulin-resistant horse. Anything that stresses a grass will increase its sugar levels. Frost, drought, and over-grazing can all cause grass to be high in sugar.

CHAPTER FOUR, Healthy Hooves.

No changes to the text, but I would like to say I am pleased to see more people keeping their horses barefoot. I have seen some say that their horse can't be barefoot, and I think in most cases this is related to the trimming style. If the trimmer is trimming the hoof in a similar way that it would be trimmed for shoes then the horse will probably get sore. It takes a special trim for a barefoot horse. I would strongly suggest you not try to take your horse barefoot unless you have a trimmer who has studied a proper barefoot trim. It may also be an issue if your ground is very rocky. In this case you may need to use boots initially until your horse's hooves can adapt. No one wants a sore horse. If the ground is very soft, your horse may not develop a tough hoof. In this case you can put down pea gravel in high traffic areas to stimulate healthy hoof toughness.

CHAPTER FIVE, Joint Health.

There are very few changes to this chapter, regarding what is needed to support healthy joints in horses. The great news is that we have so many new techniques to diagnose joint damage earlier. Ultrasound, Nuclear scan, MRI, PET and CT scans, and digital radiographs are all technologies that allow for better and earlier diagnosis.

We also have fabulous regenerative therapies such as IRAP, Platelet Rich Plasma (PRP), stem cell transplants and other treatments that support healing rather than simply covering pain. These treatments are more expensive but they can extend a horse's ability to compete and live

pain free without drug side effects.

The choice of joint supplements has also expanded. I prefer products that have fewer ingredients so the best product can be chosen for each individual. For instance, some horses show joint pain that is more related to the connective tissues around the joint. These horses do well with a product that focuses on detoxifying the body. Another horse may have pain related to cartilage damage, and a glucosamine/chondroitin product may be best suited.

CHAPTER SIX, Vaccinations.

There are very few changes in my thinking on vaccination. I still believe our horses are way over-vaccinated, and it is worse now that so many shows require vaccinations. Our horses would be so much better served if we focused on supporting their immune systems with whole, non-GMO feeds, and if we grew our hay in fields that were not heavily fertilized or treated with chemical herbicides. Then each horse could be evaluated for the need of certain vaccinations under specific circumstances.

CHAPTER SEVEN, Parasite Control.

When I wrote the first edition of *Holistic Horsekeeping*, I was encouraging people to worm less often and to use fecal exams to determine whether their horse even needed worming. I had concerns about drug resistance, and now my fears have been confirmed. We have parasite resistance to most of our current dewormers and no new drugs in the pipelines. Now it is necessary to do fecal exams to determine which horses are shedding parasites. Rather than repeatedly deworming these horses, I believe it is better to focus on improving their gut health and building their immune systems. I believe adding probiotics and blue-green algae to the diet is a good place to start. Homeopathy can be used to lower susceptibility and increase the over-all health of the horse.

CHAPTER EIGHT, Equine Dentistry.

I learned very little dentistry in vet school so was lucky to have a lay dentist who taught me so much about floating the teeth in a way that encourages freedom of motion of the jaw. I know I helped many horses

but I also think I sometimes did more than was actually needed. I worked with another dentist who did very little floating on the teeth and tried only to remove areas that were interfering with motion. Both dentists worked on the incisors but, again, I think sometimes too much tooth was removed instead of just removing specific areas of interference.

With the increased use of power tools it is very easy to over-float. Horses need proper molar contact to help them with proprioception. Over-floating can actually negatively affect the balance of the horse. I have seen horses lose top line muscling after being over-floated. I am now in the middle where I think some performance horses do better with very careful rounding of the front molars to create a smooth area so soft tissue does not get trapped between the bit and the teeth, but I don't like to see all the teeth floated smooth.

We are now recognizing the importance of the hyoid bone which is embedded in the base of the tongue and connected to the temporal bone. Arthritis at the level of the articulation between the hyoid and temporal bone can cause nerve paralysis, ataxia, head-shaking or abnormal chewing motion. Checking the freedom of movement of the hyoid is now a regular part of an osteopathic exam.

CHAPTER NINE, Disease and Illness.

I still approach most acute illness with homeopathic treatments and nutrition. Horses love this approach, and I am pleased to be teaching more horse owners how to understand and use homeopathy through my mentoring trainings.

I do want to add a section on scratches. Scratches can be acute or chronic, but the treatment would be the same.

Every horse owner dreads seeing the scaly, oozing sores that are typical of scratches in horses. Pastern dermatitis is the official name for this frustrating syndrome that causes such misery for horses. It would be so great if there was a simple, effective treatment that worked in all cases, but such is not the case. Here are the treatments most effective for

the three most common causes of scratches in horses.

Cause number one for scratches in horses:

Extended wet weather - The skin is the body's first level of protection against external pathogens or toxins. Any extended period of wetness will break down the protective properties of the skin. Wet skin combined with constant contact with mud or manure is the perfect environment for bacterial and fungal infections. Even if your horse is not actually out in the rain, high humidity that slows the drying of the skin after sweating or bathing can be a setup for scratches in horses.

Treatment for scratches secondary to extended wet weather - Clipping long hair around the affected area is important. Clipping will allow air to reach the skin and dry it more quickly. Clipping also makes it easier to apply medication to the skin. Just clip around the affected area and leave the feathers on the back of the fetlock so it can serve its function of channeling water away from the heel area.

Keeping the area dry is an obvious treatment but not always easy to do. You can't keep the rain from falling, but you can avoid bathing your horse if he is prone to scratches. Instead of bathing, mix up a 30/70 mix of liniment, such as Sore no More and water, and sponge sweat off your horse's body and legs. The liniment will serve a dual purpose of adding oils back into the skin and acting as a mild antiseptic. Avoid washing or applying any water to the areas with scratches. Instead, gently brush off scabs and apply a drying powder such as Desitin.

Nutrition can play a key role in helping your horse avoid scratches or recover more quickly if affected. Vitamin A is important for the health of the skin. Fresh, green grass is one of the best sources of Vit A, due to its high levels of beta carotene. Alfalfa hay is another good source of beta carotene that the horse's body converts into Vit A. The Vit A content of hay will diminish the longer it is stored so try to buy late in the season when putting in your winter supply. Blue-green algae such as spirulina or AFA is another great source of beta carotene that is made into Vit A.

Fatty acids are also important for skin health. You want sources of fatty acids that are high in omega 3 and omega 6 fatty acids. Such sources include flax seed, chia seed, coconut oil and blue-green algae.

Cause number two for scratches in horses:

Extended dry weather - Have you ever noticed how chapped your lips get when the humidity is very low. Very low humidity will cause the skin to become dry and cracked. Any crack in the skin creates an entry point for pathogens or toxins. Scratches in horses can occur when the weather is dry but there is dew on the grass in the early morning. The early dew softens the skin briefly, but when the skin dries it becomes chapped and irritated. The grass gets dry and prickly as the morning progresses, and the dry grass and twigs scratch the skin causing additional damage, allowing bacteria to set up infection.

Treatment for scratches secondary to extended dry weather - In the case of scratches in horses during dry weather you are best to leave the hair on the area so it can provide some protection. If the affected area gets messy you can clean it with warm, soapy water and then apply an emollient type dressing such as Icthammol. Avoid using any strong antiseptic that will further irritate the skin.

Nutritional needs are the same as for scratches occurring in wet weather, since your goal is to keep the skin well-nourished and healthy.

Cause number three for scratches in horses:

Leaky gut syndrome - Damage to the intestinal lining is a more common reason for skin lesions than is often realized. Here is how this works. If the lining of the gut is damaged then incompletely digested food particles are able to get into the bloodstream. Normally, foods are broken down into single proteins that don't trigger any type of immune reaction, and only fully digested protein is able to pass through the intestinal wall. When the larger proteins of incompletely digested foods pass through the damaged gut wall they act as antigens that trigger an

immune reaction. When the immune system determines that an antigen represents a threat, it attacks it with antibodies. It is the immune antigen/antibody complex that creates an inflammatory reaction in the small blood capillaries of the skin.

Treatment for scratches secondary to leaky gut - A horse with scratches secondary to a leaky gut will have skin lesions that persist in any weather condition. Once a horse with a leaky gut develops a sensitivity to a food, eating that food will cause inflammation in the skin. You may want to test your horse for food allergies and avoid those foods as you work to heal his gut.

Healing the gut is the best treatment to get rid of this form of scratches. You have to decrease inflammation, protect the gut lining and allow it to heal. Step number one is to decrease the inflammation in the gut. I like the mushroom/colostrum/probiotic-based products to treat leaky gut cases.

Once the inflammation is controlled the body can focus on healing. Nitric Oxide-based products will help protect and heal the gut by increasing the circulation to the gut wall so it can produce more mucous for protection. Once the lining of the intestine is healed, you can slowly re-introduce foods that once triggered inflammation, and they should no longer cause a reaction.

In summary:

The three most common causes of scratches in horses are:

- Extended wet weather
- Extended dry weather
- Leaky gut syndrome

The steps for treating scratches from wet weather:

- Clip off long hair only around affected area
- Keep the area dry and clean

Apply a drying agent to the affected area
Feed foods high in beta carotene and quality fatty acids

The steps for treating scratches due to dry weather:

Leave hair unclipped
Wash area with mild soapy water
Apply emollient dressing
Feed foods high in beta carotene and quality fatty acids

The steps for treating scratches due to leaky gut syndrome:

Test for and avoid foods showing sensitivity
Decrease inflammation in the gut
Protect the gut wall
Stimulate the healing of the gut
Repopulate the gut with good bacteria

Scratches in horses is not an easy condition to treat. Prevention is best achieved with good nutrition and management.

CHAPTER TEN, Common Chronic Conditions.

One area that has changed for me is using fewer oils in favor of the actual seeds. The seed offers a wider range of nutrients. Chia, hemp, pumpkin, sunflower and flax all offer benefits. Chia and flax offer the best omega 3 benefits for anti-inflammatory support.

Diets for horses with laminitis is another area of change. We are having more good low sugar diets come on the market. Triple Crown produces an organic timothy cube that is balanced in minerals to support a horse with laminitis due to Insulin Resistance.

I want to talk more about hives because it seems this condition is becoming more frequent. I believe this is related to the higher levels of glyphosate and other chemicals in the feeds. These chemicals affect the gut flora. Over-vaccination is also a likely reason for the increase in hives because vaccines affect the gut microbiome.

Most horses with hives do not get them from coming in contact with something in their environment. Insect stings or allergic reactions to bedding can cause hives in horses, but they are more commonly a symptom of digestive upset. This is important information on horses with hives because it totally changes how you approach their treatment. Harmful substances that get into the bloodstream and lymphatic system of the horse through a damaged gut lining can cause hives. While drugs often treat symptoms such as hives, they may not address the cause.

The lining of the digestive tract is like an internal skin. It is designed to prevent harmful substances from entering the body from the inside just like our skin prevents them from entering from the outside. When the lining of the digestive tract is healthy, the junctions between the cells are very tight. There is also a layer of beneficial bacteria sandwiched in between many tiny folds called villi, and then a layer of mucous. All of these together act as a barrier to harmful substances getting into the body from the gut.

How the gut lining prevents harmful substances from entering the bloodstream:

Tight junctions between healthy cells

Layers of beneficial bacteria between the intestinal villi

A thin layer of slippery mucous

If harmful substances get past the protective lining of the gut, the immune system becomes triggered. The harmful substances are antigens, and the immune system forms antibodies to attach to the antigens and neutralize them. These antigen/antibody complexes are what triggers the hive reaction in the skin. The best way to treat the underlying cause of hives in horses is to support healing of the digestive lining.

Support for digestive health in horses involves feeding probiotics to insure a healthy population of gut bacteria. Prebiotics such as inulin and blue-green algae are food for the beneficial gut bacteria. You will need to feed high levels of pre- and probiotics for a period of time to rebuild a

healthy gut lining. Once the hives have cleared, you can gradually reduce the levels of pre- and probiotics, but it is best to continue maintenance levels.

Nutrient dense foods, such as blue-green algae, nourish the cells lining the gut to help them multiply and maintain tight intercellular junctions. Avoid drugs such as steroids and non-steroidal anti-inflammatory agents which interfere with the production of protective mucous layers in the digestive tract.

Ways to support a healthy gut lining:

Feed pre- and probiotics to support healthy bacteria

Feed nutrient dense foods to nourish the cells themselves

Avoid drugs which interfere with protective mucous

Symptoms such as hives can be very frustrating to control. Much of the information on horses with hives does not consider the health of the digestive tract. Once you have determined your horse has not been stung by an insect or developed an allergy to his bedding you should look closely at his digestive health. Hives on the skin could be the external symptom of an equally inflamed internal skin.

CHAPTER ELEVEN, Competition-Related Disorders.

A huge shift has occurred in the horse industry around gastric ulcers and other forms of gut pain. We have literally hundreds of products for treating the digestive tract of horses and yet this area still affects performance and well-being in a large percentage of horses. Even horses turned out in pasture are developing ulcers so something else is going on. I believe we are on the right track to solving this problem with the study of how the endocannabinoid system is involved with acute or chronic stress patterns.

How the Endocannabinoid System Affects Digestion:

When the horse is stressed his digestive system does not work efficiently. Stress means fight or flight. No horse is going to properly

digest food when he feels threatened. Lots of things are threatening to a horse. Being away from his buddies, traveling in a trailer, being in a stall, going into a new arena, or changing ownership are just a few of the scary things horses deal with.

So what happens when a horse is stressed? He shuts down his digestion so he can be ready to fight or flee. He doesn't do this on purpose. It is a part of his autonomic nervous system. The sympathetic part of the nervous system kicks in during stress. In order to properly digest food, the horse needs to be operating more in the parasympathetic, or rest and digest, part of the autonomic nervous system.

The shift between sympathetic and parasympathetic is not an on/off switch. It is more of a gradient where the body is more stressed or more relaxed but ready to shift to more in either direction if needed. What can happen if stress is prolonged is more of a steady state of sympathetic tone. When this happens the body begins to show signs of chronic stress, for example, poor digestion initially and eventually, ulcers. Poor digestion also sets the horse up for decreased immunity, poor-quality hooves, and connective tissue/joint issues.

To avoid this destructive pattern we need to focus on the stress that causes ulcers. Enter the endocannabinoid system. This is the system that is responsible for balance in all the body systems, including the nervous system. When the endocannabinoid system is working well the horse can easily shift more easily to sympathetic or parasympathetic states. He can perform when he needs to and relax and enjoy his dinner when he is back in his stall.

For many horses the endocannabinoid system is not functioning well. Extreme or chronic stress can deplete this system of the natural cannabinoids the body normally makes. Luckily, some plants contain phytocannabinoids that can help replenish the body's own supply of these critical compounds. Hemp is high in phytocannabinoids and in cannabinoids such as CBD but low in THC, the main component of marijuana. Hemp is safe and most horses really like it.

For treating stress, I use a hemp product that is processed by liposonification for absorption directly through the mouth so it is able to get into the system easily and quickly. I use hemp oil daily for horses showing mild stress or those that only seem stressed by certain things. For horses with severe signs of stress and anxiety, I use a hemp oil that has hemp but also has components that help replenish neurotransmitters like serotonin. I give both in very low amounts morning and evening. I feel these products do so much to help the horse stay balanced so his digestive system can function normally.

I also give a probiotic/algae blend daily for foundational nutritional and digestive support. I never want a horse to experience the pain of a digestive ulcer. I want to be proactive in prevention. Even when we do our best to support our horses, they will be stressed by the things we ask them to do. They are so willing to do for us that it seems only fair to do all we can to keep them comfortable.

CHAPTER TWELVE, Training the Performance Horse.

The industry is shifting in a good way around the concept of training. I no longer believe that I am training a horse when I interact with it. I believe that I am always seeking partnership and I have as much to learn from the horse as the horse can learn from me. Certainly there are exercises I can do with a horse on the ground and under saddle, and I approach these as an exploration of where a horse may be holding tightness and try to help him release this. I have learned to look at *my* habits and braces, and these are often what is showing up in my horse.

I believe that when you have that special horse that you connect with it means that horse is here to teach you about yourself. That horse wants you to be the best you possible and no matter what you try to project to the world, that horse will show you what your true self is needing to do or be. Listen and learn.

CHAPTER THIRTEEN, Building and Maintaining Peak Energy Through Natural Supplements.

I still believe supplements are absolutely needed, and it is nice to see the mushroom-based supplements that are amazing for performance

horses.

CHAPTER FOURTEEN, On the Road.

Burnout is something I have been aware of for many years, and it is good to see scientific theories being explored around this subject. Polyvagal Theory is a promising area of research. This theory was put forth by Dr. Stephen Porges and there have been some very good articles written around this subject in horses. *The Polyvagal Theory and Horses: An Introduction*, by Sarah Schlote is very good. <https://equusoma.com/the-polyvagal-theory-and-horses/>.

The vagus nerve is deeply involved with the autonomic nervous system. It is made up of three complexes, one sympathetic and two parasympathetic. Most of us are aware of the sympathetic response of fight or flight and the parasympathetic response of rest and digest, but there is a third, dorsal branch of the vagus nerve. If you think of the sympathetic as the gas pedal and the parasympathetic as the brakes, then this third branch of the vagus nerve is like the emergency brake slamming everything to a halt. This is the freeze response that occurs when fight or flight is no longer an option but the stimulus remains. This is the state of shutdown or burnout that I see in far too many horses.

Of course, none of this is compartmentalized. These systems are not all on or all off but all working at the same time to different degrees. The horse in freeze mode can still perform but there can be an underlying sense that all is not well. My understanding is that to get to the freeze state, there has had to be an overwhelming stimulation of the sympathetic nervous system, and at any time the horse can shift out of freeze and have a meltdown moment but then go back into freeze mode.

Understanding when you have a horse that is shutdown you want to focus primarily on building trust and relationship so the horse can find his way safely out of shutdown. You will have to be aware and prepared if his emotions come up suddenly and allow him to find his way through them with your support. Homeopathy can be a huge help with a shutdown horse. Homeopathy will not force the horse to come out of shutdown, but it can help balance his emotional state so he is capable of

coming out of shutdown. You would want to work with a trained homeopath who could find the best remedy or series of remedies to bring about healing on the physical and emotional level.

The last thing I address is the physical and emotional health of the horse owner. Your horse can only fill in for you so much before his health is damaged. None of us wants to damage our horses, so we must take care of ourselves. This may involve looking at our unhealthy patterns and beliefs. If your horse is not working well then it could be you. Never neglect your part in the partnership. Your horse wants you to be your best, and he won't take no for an answer.