

Joint Health

Joint Health & Joint Nutrients

Today, the number of products on the market "claiming" to help joint pain or the pain of arthritis (including ring bone, navicular, etc.) in our equine friends is growing rapidly. Apparently there is becoming a greater need for our "working sport horses"(dressage, Grand Prix, jumpers, ropers, reiners, barrel racers, et al), to have specific nutritional support, which can most definitely help maintain and even repair joint tissues.

However, as a consumer and horse care taker, you need to be sure that you are buying the proper building blocks in the supplements you purchase, ingredient quality is extremely important, as is the amount of nutrients needed daily by an individual, which should be based on weight, age, and severity of the problem or deficiency, and what the horse is used for. Be an educated consumer.

Although the following article is geared toward our equine friends and their specific joint needs, the principals of nutrition and nutritional supplements are just as true for people and pets as they are for horses.

Normal cartilage is smooth and wear resistant, allowing nearly frictionless movement of the joints. It is composed of collagen, water, proteoglycans (chondroitin sulfate, keratan sulfate, and dermatan sulfate), and hyaluronan. The cartilage covers the end of the bone, called the subchondral bone. The synovial fluid cushions the bones of a joint, while ligaments enclose the joint capsule and provide stability. Muscles provide additional support to the joint.

If a joint is damaged, genetically miss-aligned or improperly constructed, changes can and will occur to the cartilage. The cartilage surface will become rough, stress to the underlying supporting layers will then cause fissures, the collagen then begins to break down, the cartilage thins, proteoglycan begins to be depleted or lost into the synovial fluid. All of which then causes the resultant pain when the joint moves (articulates) during normal activity because there is no longer the "frictionless movement" of the healthy non-injured joints.

The horse has key "motor joints" which include the hock, knees and ankles, these are all formed by bones that do not interlock but instead are stacked on top of each other, like building blocks and held together or connected by only flexible, fibrous tissues. These joints are called synovial joints for their ability to flex freely, and at the center of these joints is the sticky yellow fluid secreted by the synovial membrane lining of the joint capsule. Synovial fluid is as crucial to the horses joints as is oil to a car or truck engine, as it works on the same principal because it acts as a lubricant that protects the bone surfaces from abrasion as they slide over one another doing their jobs.

Trauma is not the only way joints get damaged. Normal use over time can also lead to degeneration and breakdown. Racing, running, jumping, dressage, polo, roping, cutting, carrying heavy loads, being worked beyond his ability, being over-weight and normal daily movement all accelerate joint

problems, especially if the horse is being fed improperly or has poor nutrition or cannot absorb what he is being fed.

When a joint hurts, it is the natural response for the other joints to compensate and do more of the work to let the painful joint rest. Left on their own, joints repair themselves very slowly. If a damaged joint is not rested, it will certainly get worse. In addition to not having the joint work as hard, the immune system supplies it with more blood than usual, this extra blood then feeds the joint more nutrients so that it can repair faster. This natural healing process however is what causes inflammation, heat and swelling.

The majority of equine (and human) joint problems can be addressed through nutritional support, with surgery only being needed when a piece of the cartilage (the tissue that covers the ends of the bones in a joint) is torn or loose, wherein it would need to be removed or repaired, or surgery may be necessary when the support structures are physically separated which would also need repair.

Degenerative Joint Disease (DJD) – Over time, cartilage can erode entirely, which then results in bone-on-bone grinding and even more disability and pain. Although DJD can affect any joint, it usually affects in horses the: Hocks (ankles) where it is commonly referred to as Bone Spavins, Fetlocks, it also affects Pastern and Coffin joints. In the area of the Pastern and Coffin Joints when DJD becomes most severe, it is then referred to as Ringbone; DJD can also occur in the Stifle (knee) joints, although much less common, although even less common it may even occur in the Spine (neck and back). Degenerative Joint Disease (DJD) is one of the most common causes of lameness in today's sport horses.

Navicular Syndrome – A breed tendency for a more upright pastern may predispose certain breeds of horses to the development of navicular syndrome. The more pressure that is applied to the navicular bone from the deep flexor tendon, the higher the probability that the horse will suffer from navicular disease. Quarter horses are at a much higher risk and have a higher incidence rate than other breeds of developing navicular.

A horse's activity level may also play a role in the development of navicular syndrome. This is particularly true when the horse is utilized in stressful athletic activities for which he is not suited. Horses that undergo a fair amount of percussion on the forefeet are inclined to experience navicular syndrome including jumpers and endurance horses. Barrel racing, for example, puts a lot of stress on the horse's foot and may lead to navicular problems as well. Increased pressure can also be caused by overweight horses and horses with small feet (proportionate to the size of their bodies). Again, a good Farrier can help to prevent this syndrome with the right shoeing.

Osteochondrosis or OCD as it is most commonly referred to seems to have some genetic influences, in addition there are other factors including horses who are overweight, prolonged inactivity/then intense activity and improper shoeing, all contributing towards the likelihood of developing OCD. The symptoms of OCD depend on the area that is affected by the condition. Stiffness, lameness and pain in the affected joint are common signs that a horse may have or be developing the disease. Horses with OCD do not always experience pain, however, the horse may try to compensate for the lameness by restricting movement of the affected joint.

Some of the symptoms of OCD are as follows: Pain, stiffness and swelling around a joint that lasts longer than two weeks. In the early stages of the disease, an affected horse's joints may ache after activity. Stiffness will be apparent and will tend to follow periods of inactivity, such as sleep or prolonged standing. Decreased performance and inability to perform activities that were once performed with ease or appearance of bumps or swellings, especially on the extremities is reason to call the vet and get a diagnosis.

Osteo–Arthritis (OA) – OA is not a disease in and of itself, but is a degenerative condition caused by other joint problems. The two types of problems that are commonly associated with OA are trauma (abnormal force on a normal joint) or congenital or genetic (normal force on an abnormal joint, such as that which has been found to cause OCD).

Prevention – The joints of young, fast–growing horses can benefit from the right "extra" nutrients and may even help to prevent problems in the future. It is also imperative that the amount of calcium and phosphorus should be carefully balanced during the growth years. Copper, zinc, vitamins A and D are all necessary in the proper amounts. The addition of, and supplementation with, vitamin C has not been shown to be necessary by clinical tests, however, it is one of the nutrients that helps to build healthy collagen and joint tissues.

The best nutrition possible should be provided when a young horse is in its growing years, so it can reach its full potential without the risk of epiphysitis or other joint problems. (see equine nutritional recommendations). Horses of all ages that are regularly being worked, trained or used in competition and are putting great stress on their joints should receive the additional support of extra nutrients, including Vitamin C, MSM and Glucosamine Sulfate (not Glucosamine HCl – more on that later).

An experienced journeyman farrier, or an experience "barefoot trim farrier" can help assess whether your horse's shoeing and/or trimming is contributing towards joint problems or possible future joint issues. Your farrier is one of the most important people in your horses life, and good ones can be a challenge to find. Ask your veterinarian who he/she might suggest, or who he/she uses. Look for someone who is capable, educated, and well–respected, or ask some of your friends and people who you respect for a referral to someone who has extensive training, who belongs to one of the farrier societies and who really has your horses best interest and health, as well as long term use in mind. Someone who will work with you and your horse, and explain why they might be doing what they are for the long run. Your farrier and your horses feet should not be the area that you look to in order to save money as a horse owner, as the old saying goes, "no feet, no horse".

Most horse owners take greater care to protect the "outside" of their horse (especially when traveling to shows or competitions) in order to avoid blemishes or injuries. When in reality the same kind of care should also be taken for the inside of the horse and especially when it comes to the health of his joints. If a joint injury does occur, proper nutritional supplementation is definitely appropriate, and as bodies age, joints naturally wear out faster than they are repaired or maintained, however with the use of nutritional supplements with "preventative" amounts of joint supplements those same joints can stay healthier longer and prevent dis–ease.

We don't enjoy pain, and neither do our horses. Pain serves a very important purpose, it lets the rest of the body know that something is wrong. In traditional medicine, immediate masking of pain is accomplished through the use of drugs that are placed in the body either orally or by injection. These drugs, which may also include herbal ingredients change the way the body normally functions so that pain is not recognized and/or the immune system stops the inflammatory response, which then also in some cases actually slows the healing process. It treats the symptoms and masks what is really going on in the body and does not take care of the underlying cause.

The main types of drugs used are steroids (such as Cortisone or Prednisone), non steroidal anti-inflammatory drugs (NSAID's) (such as Banamine, Phenylbutazone, or Aspirin), or other drugs that alter the recognition of pain or interfere with the immune response.

The problem with Steroids and NSAID's are that in the long run they may cause joints to deteriorate faster than if these drugs had not been used at all. Some of these drugs also decrease the joint's ability to use sulfur, which gives connective tissue its elastic strength. These drugs (their chemical compounds) interfere with how tissues are made and how they heal or ultimately repair themselves. Since the pain is masked, they play a role in how the workload is divided among joints, slowing the healing, and increasing the risk of additional or further injury.

The ingredients most commonly added to joint supplements are added either to mask or cover symptoms (pain or inflammation) not to address the underlying problems that are causing the pain which is the fluid around the joint, the cartilage or the joint itself. Drugs (which include most of the "herbs" used in natural formulas) can quiet pain very quickly and effectively, but they do not prevent or attempt to heal or cure the problem.

So then, how does one really determine what supplement or blend of supplement products, including herbs, is the best, as well as the most effective, for the money spent? When choosing a joint supplement, or "flex product" as they are most often being referred to, the first thing you must decide is whether your intent is to make the joints feel better on a temporary basis or do you truly want to help solve the problems that are causing the pain for the long term.

When you answer the questions then you must read the labels to determine the ingredients, and do a little research on how the ingredients react or interact together for bio-availability of the nutrients. And then ask yourself, was "it" (the product) researched and manufactured by a group of professionals to address "structural problems" and not just designed to cover pain? Lastly, be sure that when you are buying a daily supplement for your horse, you are providing nutrition not just drugs, and at the dosage suitable for your horse's age, weight and work load.

For a horse's body to use the building blocks provided through good nutrition, as well as an appropriate supplementation program, with all of the proper nutrients added to rebuild tissues, it usually takes 4–8 weeks for enough new fluid and tissue to be present for the pain to stop, and can take upwards of 6 months to a year for the horse to complete the repair/recovery.

At Earth Song Ranch, we have found it imperative that the horse also be able to absorb those nutrients as well, because most horses who compete have compromised digestive systems to one degree or another, which can be because of gastro-intestinal upsets from the stress of competition, stress of travel, pain, worming, vaccines, rounds of anti-biotics, and especially those horses who are over the age of 6 and competing on a regular basis (see ulcer article).

We take the entire horse in to consideration when we design our products, and we blend specific nutrients and herbs with Pro-Zyme to make our Joint Formulas far more effective, readily bio-available, more absorbable and therefore more useable by any horse. There are no other products on the market that use our technology or design. For one thing we use more expensive, human grade ingredients, there are no animal by-products in any of our products, for example our Hylauronic Acid is plant cell wall derived, not from Bovine nasal cartilage or Rooster comb. We have your horse's health in mind at all times, since we too are horse owners, and some of our own horses use the products.

About 50 years ago, scientists found, that over time, eating ground up connective tissues could help relieve problems associated with arthritis. People then began to consume gelatin and cartilage (shark, chicken, bovine, or Perna muscle). However, scientists who studied these products found that the most helpful substances in them were in the family of chondroitin sulfates.

Then scientist eventually started to feed the ground up – connective tissues to horses, and in so doing what they found out was that whole cartilage and its large molecular components (chondroitin sulfates and collagen) cannot be absorbed well by the body. While large molecules such as these can be injected and work well in some cases, it was found that when taken orally more than half would usually end up in the manure, un-used and un-absorbed. Only 8–10% of the smallest molecules had been shown to get from the gut into the blood intact and then used by the joints. Another concern with these mixed, animal byproducts was that they also had a history of causing allergic responses in some animals. Allergic responses to many types of collagen have been well documented in horses. I don't know about you, but I have a problem feeding an herbivore animal bi-products, and with the advent of mad cow disease, I think I would rather not chance it.

Then about 30 years ago the research began focusing in on a much smaller, more efficient, nutrient that is the most basic building block of connective tissues and fluids – Glucosamine Sulphate, which differs from Glucosamine HCl and N-acetyl-glucosamine.

There are several types of glucosamine used in supplements. They are all different from each other, only one of the glucosamines really has any value and is the most expensive to purchase, however it does work, it is absorbed and it does its job. The basic three that are added to joint supplements are: Glucosamine Sulfate: Is a sugar like substance produced in the body and found in small amounts in foods. It's role and function is in maintaining healthy cartilage, which is the gel like material that cushions the joints. It is used by the body to synthesize the molecules that give shape, elasticity and rigidity to such tissues as cartilage, tendons, ligaments, discs, and mucous membranes. It also serves to restore the thick gelatinous nature of the lubricants and tissues in and around the joints.

Glucosamine Sulfate has been used successfully as long-term treatment and preventative maintenance in humans and animals. Supplementing with Glucosamine Sulfate helps to provide joint "protectants" during times of heavy work, competition, training, and times of excess stress on the wear on the body.

Glucosamine Sulphate is one of the basic building blocks of connective tissues and fluids. Studies have shown that when Glucosamine Sulphate is given orally, within 30 minutes 87–97% is actively taken from the gut into the blood. Further, within 4 hours the chondrocytes (joint cells) have actively taken it from the blood. When linked together with sulfur, chains of glucosamines become several different types of connective tissues and joint fluid. [A lack of sulfur will cause the production of connective tissues to stop.] Also an enzyme can slightly change the shape of the glucosamine so that it is also the basic building block of the chondroitin sulfates.

In one clinical study, where Glucosamine Sulphate was feed to horses, 77% of Navicular disease and 100% of Spavin cases returned to normal function.

N-acetyl-glucosamine has been proven to not have active uptake from the gut of a horse. Therefore if you purchase a product with this ingredient, you are wasting your money and your horse will not benefit.

Glucosamine HCl is very inexpensive and is not stable in liquids. There are several products on the market that use Glucosamine HCl, which is sad, because published experiments have shown that over half of the Glucosamine HCl added to a liquid solution will breakdown within 27 hours. Within 4 days, these new and different "breakdown products" form completely different molecules that were 20 times larger than what was originally in the solution, and not as absorbable in the gut or as useable.

There are no studies that show if Glucosamine HCl is/ or can be actively taken in from the gut, or how much of it actually gets into the body or the joints. Whatever portion does make it into the joints must then undergo changes before it can be used in the connective tissues. For the Glucosamine to work the way nature intended, the HCl must be removed and a Sulphate added.

MSM – MSM is a naturally occurring bio-available sulfur compound necessary for collagen synthesis: skin, hair, nails (bones, muscles and organs). Some research shows that it softens the tissues, including skin, relieves arthritis and rheumatic discomforts, detoxifies the body and increases blood circulation. Other research is showing that it increases energy, and acts as an analgesic with potential for anti-inflammatory actions. It is also shown to increase blood flow, and may contribute to maintaining as well as repairing cartilage.

Ascorbic Acid " Vitamin C " is an important water-soluble anti-oxidant that is needed by the body for healthy skin, tendons, bones and surrounding tissues. It aids in the formation of collagen and is a major component of cartilage.

Hyaluronan is a glycosamunglycan and works in conjunction with Glucosamine Sulfate, MSM and Vitamin C, and provides basic building blocks to repair and maintain joint health. Almost all the

products on the market that list Hyaluronic Acid (HA) are using the animal-by-product form. The reason Earth Song Ranch uses the plant cell wall derived form is that we do not use any animal-by-products in our formulas, horses are herbivores not carnivores, and we believe that they do not have the ability to digest any form of animal-by-product proteins, nor should they be given any.

Because "joint supplement ingredients" (ie. Glucosamine, Hyaluronic Acid, etc) are sold as a nutraceutical they have not had to undergo the rigorous testing required by the FDA, which can cost upwards of millions of dollars for FDA approval. And because they are nutraceuticals, they cannot be patented, so researchers can say it is working, but there is no published data, not yet anyway. Hyaluronic Acid is available in oral supplements and is being used by some horse owners for horses who work hard enough to be at risk for joint problems, but who may not be showing any symptoms or signs of lameness.

What the latest scientific research is also showing is that the Glucosamine Sulfate works best in conjunction with MSM and Vitamin C, along with HA oral supplementation. The four ingredients all seem to support one another working together to increase the bio-available rate of absorption in the body, which in-turn increases the synthesis of collagen and synovial fluids, and decreased the inflammation and time needed for repairing and healing the joints, and with a small amount of Hyaluronic Acid added it appears to be a complete joint health supplement which we include and offer in the Earth Song Ranch Joint Support Products.

There are several injectable products on the market that work on the sound principles discussed above (Adequan, Legend, Hyaluronic Acid – – not steroids). These provide basic building blocks to joints in high concentration (whether injected in the muscle, veins, or in the joints) and they do not just mask the pain. However, just like the whole body, joints need to be feed every day, not just every 4 – 6 weeks by injection.

The fastest, most effective and economical way to address serious joint, fluid and connective tissue problems is to start a high quality oral supplement at the time of a first injection (of either Adequan, Legend, or Hyaluronic Acid – – not steroids) which combines all of the nutrients for joint health, such as Farrier's Choice Hoof & Joint, Farrier's Choice Joint Support, Earth Song Ranch Pure Joint Juice or Pro-Zyme Herbal Joint Support, etc. All of these products were designed with prevention in mind, and as a preventative and supportive nutritional supplement, we will always keep up with the latest research in this area, and change our formulas accordingly.

Current research has been showing that feeding a daily, high quality, nutrient rich, supplement specifically formulated for joint health will decrease the frequency of, and hopefully eliminate the need for, further injections, or limit the number needed per year.

Only recently it has been discovered that stem cell injections, made from the horses own stem cells can be injected in to an already injured area, including joints and ligaments and also assist with healing. Stem cell therapy for treating injuries in horses is a fairly new technology. Treatment of tendon and ligament injuries with bone marrow (which contains a few stem cells, as well as growth

factor, both of which aid healing) has been in use for several years, but use of concentrated stem cells has only been available since 2002. Stem cells are primitive cells stored in various parts of the body, waiting to be sent out on emergency missions to repair injuries. If a bone breaks or a ligament tears, signals are picked up by the stem cells and they travel to the injury—where they transform into whatever tissue is needed. A company in San Diego, Vet Stem Research, has been leading the charge with this new treatment with great success, their web site address is: www.vetstem.com and is a great resource for people interested in stem cell research and how it may help their horses.

The cost of Farrier's Choice Hoof & Joint, Farrier's Choice Joint Support, Earth Song Ranch Pure Joint Support or Pro-Zyme Herbal Joint Support is far less expensive than monthly injections, and better for the horse. The Farrier's Choice Pro-Zyme Herbal Joint blends include probiotics and digestive enzymes, organic minerals, vitamin C and other nutrient rich ingredients that support the horses overall health while supporting his joint health.

We also use herbs in some of our products, some which are also commonly used in other joint products, following are some of those herbs with the type of chemicals they may contain and their benefits:

Yucca (*Yucca schidigera*) is rich in steroid-like saponins that elevate the body's production of cortisone, which may be beneficial for treating arthritis, osteoarthritis, & rheumatism type symptoms. Yucca is used for inflammation and pain control and it also appears to block the release of toxins from intestines that inhibit the normal formation of cartilage.

Devil's Claw: The major use of Devil's Claw is for anti-inflammatory and analgesic properties especially in the musculo-skeletal system. It is used where there is pain and inflammation or for any form of degenerative joint disorder, or boney changes resulting in inflammation. It has naturally occurring compounds that have been shown to have an analgesic/anti-inflammatory effect comparable to cortisone and phenylbutazone. Devil's Claw also stimulates healing.

White Willow Bark: Is an analgesic & an anti-inflammatory. Like Queen of the Meadow it contains salicylic acid, which gives it its anti-inflammatory properties.

Nettle: Is used to stimulate circulation, which makes it ideal for conditions such as laminitis, rheumatism and arthritis. It is a rich source of vitamin C and high in Iron.

Comfrey: Helps to heal bone, cartilage and soft tissue injuries. Traditionally it has been used as a remedy for rheumatism and arthritis. It contains naturally occurring allantoin, which stimulates cell production, so encourages wound healing both internally and externally. It is also an excellent natural source of B-12.

Boswellia Serrata: Is an herb used for inflammation and pain control. Boswellic acids have an anti-inflammatory action much like conventional non-steroidal, anti-inflammatory drugs (NSAID's). However, unlike NSAID's though, long-term use of Boswellia has never been shown to lead to

irritation or ulceration of the stomach. Boswellia also inhibits pro-inflammatory mediators in the body.

Burdock: Extremely useful in treating arthritis, and rheumatism type stiffness.

Queen of the Meadow contains, in its flower buds, some of the same compounds found in the bark of the Willow that was used to make aspirin, called salicylic acid, so it also has anti-inflammatory actions on rheumatic pain and fevers.

Celery Seed: Is anti-inflammatory and diuretic. It is used for treating arthritic conditions and joint stiffness

Sarsaparilla – Used by many Indian tribes in the American Southwest, this herb is known to increase circulation to the joints and reduce inflammation caused by arthritis. Aside from containing steroidal saponins and phytosterols which are believed to contribute to its therapeutic effects, Sarsaparilla also contains calcium, copper, iron, iodine, potassium, manganese, silicon, sulphur, vitamins A, C, B complex and D. Vitamins A & C are anti-oxidant vitamins and necessary nutrients for connective tissue vitality.

Disclaimer – * Under current legislation, Earth Song Ranch is not permitted to make claims in support of health benefits derived from natural formulations. This means we cannot make specific statements as to how Farrier's Choice Hoof and Joint" or Joint Juice itself or the other "joint formulas" we offer may help your horse overcome the pain and inflammation associated with degenerative diseases, or in fact help to maintain, repair, rebuild, prevent or support joint, cartilage and synovial fluid health. Giving your horse any of our natural formulas, including Farrier Choice Hoof & Joint" should be a decision based on personal research and understanding of the role food-derived antioxidants, probiotics and enzymes, along with Glucosamine Sulfate, MSM and vitamin C play in the health and well-being of joints and other connective tissues in the body. All of our supplements are designed to be "lifestyle supplements" for the health and well being of your horse.

The information provided within this site is for informational purposes only and is not intended as a substitute for advice from a veterinarian or other health care professional, and should not be used for diagnosis or treatment of any health problem or for prescription of any medication or other treatment. A health care professional should be consulted before starting any diet or supplementation program, before administering any medication, or if your horse has a health problem. Do not discontinue any other medical treatments without first consulting your health care professional.

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