

ProMotion Technical File

There are several factors to consider when using chondroprotective agents. The ideal formula should contain quality ingredients that encompass a wide range of activities and functions. Does the formula contain nutrients that will supply the building blocks for tissue building and rehydration of the joint? Does the formula also contain ingredients that can help your pet's body minimize the impact of the aging process and the impact to the joints and articular surfaces? Are there any new and safe nutrients that can be used to make a truly complete formula? Is it easy to administer, since pets may be taking the product for extended periods?

First, consider the basics of joint health and the reasons for use of a chondroprotective agent.

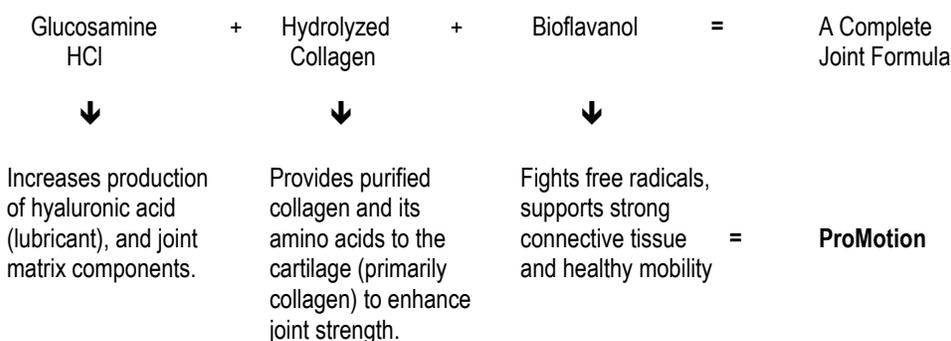
Some animals are predisposed genetically to joint issues and degeneration of joint tissue may occur at a very early age. Other animals may experience abnormal wear and tear on joints due to poor conformation and/or excess mechanical stress to the musculoskeletal system and therefore the joints. Yet another group of animals may experience damage due to the aging process and insufficient healing mechanisms. Whatever the reason for mobility issues, a chondroprotective agent could be helpful to maintaining joint health.

Free radicals are a necessary component of all living systems, but are also a major contributor to joint damage. They are energetically unstable molecules that are missing electrons or have unpaired electrons. Free radicals travel in the body until they can steal an electron from another molecule. The free radical has now been quenched (stabilized) but has left the other molecule as a free radical. This reaction cascades and forms a path of destruction, usually to cellular membranes. If the cellular membrane is damaged over a great enough area, the cell can die and genetic material can be lost or damaged. Free radicals have also been shown to contribute to cartilage damage by irreversibly breaking down cartilage matrix proteoglycans. Free radicals can be a beneficial player in the body's defense mechanisms by destroying bacteria, but if left unchecked can damage normal cells and tissue of the body.

The damage caused by free radicals is called oxidative damage. Tissue, such as cartilage, may be placed under oxidative stress in many conditions including injury and normal metabolic processes. The body does have antioxidant systems built in, but in times of stress, they may not be sufficient.

How can ProMotion help?

ProMotion can rehydrate and rebuild cartilage as long as there is still a good amount of cartilage in the joint to serve as base material. ProMotion has beneficial antioxidants including the Bioflavanol, a plant polyphenol especially helpful for maintaining healthy joint tissue. ProMotion's complete formula contains glucosamine HCl and hydrolyzed collagen, an innovative nutrient for keeping cartilage healthy and strong. Using ProMotion may result in stronger, more youthful joints with greater ranges of use.



It is important to take ProMotion consistently. Why? Because cartilage is a non-vascular tissue. The only blood supply to cartilage is provided by vessels embedded in the inner layer of a fibrous membrane (perichondrium) that covers the outer surface of all cartilaginous structures. The cartilage cells (chondrocytes) within the matrix must rely on diffusion to attain the nutrients they need. Supplementation is important for boosting the quantity of nutrients available to each cell. Feeding chondrocytes what they need can stimulate reconstruction of cartilage and matrix. Without capillaries supplying the joint health nutrients of ProMotion directly into cartilage, the joint building amino acids, peptides, trace nutrients and co-factors must slowly diffuse through the structural matrix from joint-lubricating synovial fluid and from the capillaries of the perichondrium. If the animal is given ProMotion

daily, you will increase the flow of nourishment, urging more of the nutrients into the cartilage. They will diffuse to the chondrocytes, and healthy joint tissue construction will begin.

Joint health changes you may see include changes in strength and mobility that may be noticeable in less than six weeks. Each pet is different, particularly in the highly individual realm of joint health. Many animals may respond much quicker. A key factor to remember is that for any chondroprotective product to maintain healthy joint tissue, there must be an existing base of cartilage. Our experience shows that better mobility may be noticeable in two weeks, but the actual process of building healthy joint tissue may take longer and will be ongoing. Each animal has its individual genetic script to follow, and has used its body differently over the years.

Glucosamine has been heralded as *the* supplement for rebuilding cartilage. In fact, glucosamine is a major constituent of hyaluronic acid and is preferentially utilized in the synthesis of that substance. Hyaluronic acid is an acidic mucopolysaccharide present in the extracellular matrix of connective tissues. Its primary function is attracting and holding moisture in the joint capsule. Glucosamine also forms complexes with other protein-sugars during construction of the matrix. Dietary glucosamine then is notable for its ability to increase hyaluronic acid supplies, leading to rehydration of cartilage and the build-up of the adhesive ground substance (matrix). The re-infusion of water into cartilage caused by glucosamine will plump it up to restore much of its shock-absorbing properties. Because specific nutrients are utilized by chondrocytes to build new cartilage, the complete ProMotion formula, not just a glucosamine product, is important for complete joint health maintenance.

Cartilage regeneration requires collagen built from the amino acids hydroxyproline, proline, hydroxylysine, and glycine, for example. Hydrolyzed collagen supplies these and more in ProMotion. Glucosamine stimulates chondrocytes to fuller activity, and helps maintain cartilage matrix, but if the other raw materials are not present in sufficient quantities, cartilage will not be constructed. If, for example, an animal is given even 100 milligrams of glucosamine HCl each day forever, some restoration of cartilage may occur. However, the rate of restoration will be reliant upon the availability of all the required nutrients and on the condition of the cartilage in the joint needing healthy tissue maintenance, not just the amount of glucosamine.

The synergistic balance of ProMotion extends into the vitamin/mineral pack of vitamin C, manganese, cysteine and zinc. Vitamin C is necessary for proper collagen synthesis. Manganese is important to proteoglycan synthesis. Deficiencies of manganese can lead to bone loss and connective tissue fragility. Cysteine is an important source of sulfur and supports the body's glutathione supply. Zinc is important for healthy tissue and as a coenzyme for metabolism. All four are excellent antioxidants as well, which is important for healthy connective tissue.

The bioflavanol, a plant polyphenol from grape seed extract, also gives glucosamine, hydrolyzed collagen and the other nutrients in ProMotion a better chance to work to build healthy joint tissue. The bioflavanol can support healthy collagen by acting as a bridge between broken fibers.

ProMotion can be a powerful sports medicine tool for animal athletes. Routine use will not only prevent oxidative stress, which is prevalent in the working athlete, but can keep joints performing optimally.

Why isn't chondroitin sulfate in ProMotion? ProMotion does not include chondroitin sulfate for several reasons. First, glucosamine has a much smaller molecular weight than CS and there is evidence of better absorption for glucosamine than for CS. Second, glucosamine is an amino sugar that is a precursor to the major classes of glycosaminoglycans, including CS. In the body, glucosamine is usually acetylated and used or transformed to galactosamine by epimerases. These amino sugars combine with acidic sugars in repeating units to form CS or other glycosaminoglycans. Oral glucosamine supplementation directly increases the production of CS by 70%, whereas galactosamine supplementation does not have the same effect. Glucosamine is less expensive than CS, and helps keep the joints healthy without adding unnecessary cost to a product your pet may use for many years.

ProMotion Ingredient Rationale

Glucosamine HCl - Supports the body's ability to generate new joint tissue, thereby supporting mobility. Supplementation of this bioavailable ingredient directly increases the production of hyaluronic acid, which is essential to the rehydration of the joint matrix. Glucosamine is also a rate-limiting nutrient for the production of the proteoglycan component of the cartilage matrix.

Hydrolyzed Collagen – Supports cartilage and joint matrix synthesis by supplying the amino acids necessary for collagen synthesis. Hydrolyzed collagen supplies both essential and nonessential amino acids in a highly purified, digestible form. One

important amino acid it contains is hydroxyproline. Hydroxyproline makes up a major portion of collagen (approximately 10%) and is not readily available from the diet, so supplementation is important.

Bioflavanol – A potent free radical scavenger with vitamin C sparing properties. May also help support the replacement of broken collagen bundles, helping to restore flexibility to connective tissue.

Cysteine – Antioxidant that increases the body's endogenous supply of glutathione. Cysteine is a sulfur-containing molecule, which can donate its sulfur groups to collagen for proper cross-linking and to proteoglycans to help them maintain their proper structure and function.

Vitamin C – Another important antioxidant necessary for collagen synthesis, it helps maintain normal connective tissue. Vitamin C will also stimulate the production of hydroxyproline, another necessary component of collagen.

Manganese – A significant trace mineral that can act alone as an antioxidant in the blood stream and is also a cofactor of the endogenous superoxide dismutase antioxidant system. Superoxide dismutase is important within the joint matrix to prevent oxidative damage in the joint. Manganese is also required by the body to maintain the strength of tendons, ligaments and bones.

Zinc – An important trace mineral that is an antioxidant on its own, and is important as a coenzyme for metabolism. Zinc promotes healthy skin and supports the immune system. Supplementation is important, as zinc has been greatly depleted in the agricultural soils over the years.