



Standard Process® Canine Musculoskeletal Support™

Exercise physiology requires the increased function of several organ systems, energy metabolism pathways, and nutrient needs. There is an energy cost for running a well tuned machine. During exercise an animal requires five to ten times more water soluble vitamins. Vitamin C promotes chemical reactions that release energy with muscle contraction. B vitamins are required for nerve and tissue function. Production of lactic acid will consume calcium, magnesium and potassium reserves, which need to be replaced.

Without vitamin D toxic wastes accumulate giving a body the muscle soreness of overwork. Vitamin D is also necessary to upload calcium assimilation from the intestinal tract into the blood. From there vitamin F delivers it to the muscles. Along with vitamin E it converts blood calcium and magnesium into a form useful to muscle and nerve function. Whole vitamin E complex also serves as a building block for other vitamins and minerals required for the manufacture of collagen.

As with all of the veterinary support formulas, Standard Process® knows that no system functions independently. That is why this product includes tissue extracts from kidney, liver, adrenals, intestinal jejunum, and muscle and bone protomorphogen™. Pea vine juice, alfalfa juice, mushrooms, and beet root and leaves provide whole vitamin complexes and chelated minerals. *Boswellia serrata*, is present to reduce inflammation and support cartilage and glucosaminoglycan. Perna canaliculus is the chondroitin source.

“Probably the most outstanding feature of the physiological action of vitamins and minerals is the effect upon muscle metabolism and function.”

- Dr. Royal Lee

Canine Musculoskeletal Support™ is designed to promote health at all stages of joint and muscle dysfunction and disease. While the greatest benefit is gained with early implementation, it is never too late to start. Whether the dog is a healthy athlete or an arthritic senior, he can enjoy life more fully with joints that move smoothly and muscles that support those joints. Select this product as your first choice when designing a nutritional program for dogs with musculoskeletal dysfunction.

Cases for Standard Process® Canine Musculoskeletal Support™

- Osteoarthritis, bone and joint symptoms
- Connective tissue weakness (cruciate ligament and patellar luxations), sprains, strains
- Muscular disorder, disc disease
- Post-operative orthopedic surgery
- Maintain a competitive dog's edge and tissue integrity

References:

- *Nutrient Requirements of Dogs and Cats*, The National Academies Press, Washington DC. 2006.
- Hand, Thatcher, Remillard, Roudebush: *Small Animal Clinical Nutrition* 4th Edition, Mark Morris Institute, 2000.
- *Lectures of Dr. Royal Lee, Volume II*, Salene River Press, (970) 416-8758.
- Product Information, Standard Process, Inc.



INTEGRATIVE VETERINARY
EDUCATION, INC.

Ava Frick, DVM
1825 Denmark Road
Union, MO 63084

Phone: 636-583-6293
Fax: 636-584-0371

E-mail: dravafrick@charterinternet.com
www.petbodybuilders.com

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What is Cytosol™ Extracts?

Dr. Royal Lee, the founder of Standard Process®, took great pains to analyze every aspect of plant and animal tissue before determining what was needed. As an engineer he designed many pieces of equipment that specifically enabled him to extract essential nutritional components from plants, animal organs, and the cytoplasm of glandular cells. Cytoplasm contains cellular organelles plus nutrients, such as enzymes, hormone precursors, and synergistic cofactors that are the biochemical building blocks essential to cellular metabolism in their respective tissue. Extracts of such can assist the day-to-day function of a system that is operating at sub-optimal level by supplying all these nutritional factors which the body can immediately use to its benefit.

What people are saying about using Standard Process® products for their pets...

“Tag is a senior citizen but continues to perform and compete. I’m certain he would not be the competitor he is without the help of Standard Process.”

- J. Nieder

What does PMG™ Mean?

The letters “PMG” as seen on many product labels stands for protomorphogen™. In 1947, Dr. Royal Lee, the founder of Standard Process®, after years of research published his theories “Protomorphology: the Principles of Cell Auto-regulation.” “Proto” coming from prototype and “morphogen” for morphology. It is this which sets these products far apart from any other nutritional supplements.

A protomorphogen is a chromosome end product made in the nucleus of the cell. It is that cellular chromosome component that is responsible for morphogenic determination of cell characteristics. It is the smallest unit of the gene system that guides the cell into its hereditary form as it grows, develops, or repairs itself. While PMGs are generally thermostable up to 700°C, oxidation can destroy some of the growth influencing potential of PMG. Without sufficient PMG in its chromatic the cell degenerates, de-differentiates, becomes senile and dies.

So how is PMG regulated? These tissue specific mineral containing nucleoproteins are antigenic in nature and stimulate the response of natural tissue antibodies (NTA). The NTAs control the level of extracellular protomorphogen in blood and lymph. Normally the body maintains a balance between PMG and NTA. When the NTAs exceed the peripheral circulating PMG level, the situation exists where the natural tissue antibodies could actually attack the diseased organ or tissue itself! Hence the need for PMGs. We can see many patients exhibiting this in auto-immune disease.

Introducing external tissue specific protomorphogen via the alimentary route can redirect the abundant natural tissue antibodies away from the organ. While PMG used in Standard Process® products is derived primarily from bovine and ovine species, a dog allergic to beef, for example, will not have the same allergic response to PMG because it is not protein derived from muscle.