

Joint Support 2.0

INNOVATIVE NEW INGREDIENTS FOR JOINT HEALTH



Rose Lemarie, DVM, DACVS

Osteoarthritis is one of the most commonly diagnosed canine diseases. Dogs often become arthritic due to injury, obesity, aging, or immune mediated diseases. There is no cure for this painful, debilitating condition in which the inflammatory cycle is self perpetuating, resulting in cellular death and cartilage destruction. Affected patients often require treatment for the rest of their lives. Treatment options include pharmaceuticals such as NSAIDs, supplements, weight loss and exercise regimens, and surgical intervention. Nutritional supplements may be used alone or in conjunction with other therapeutic options to enhance efficacy and decrease side effects and complications.

Nutritional supplements have been used for decades in both human and veterinary medicine, beginning with glucosamine and chondroitin. Other compounds such as hyaluronic acid, MSM, essential fatty acids, and others have been used in products and foods over the years. Scientific support for the safety and efficacy of these products has historically been spotty and results/claims have often been anecdotal. In recent years, additional supplements have been developed and better studies have been performed to determine mechanism of action and efficacy of these compounds.



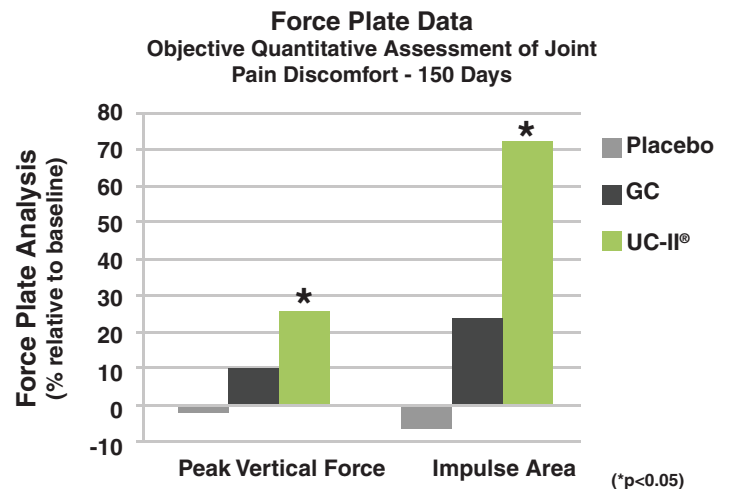
Undenatured Collagen II (UC-II)[®] derived from chicken sternum has been shown to result in significant declines in overall pain, pain during limb manipulation and lameness after physical exertion in canine osteoarthritic patients. Although the complete mechanism of action is not entirely understood, a small amount of UC-II taken orally has been shown to modulate the immune response targeted at type-II collagen in joint cartilage, resulting in improved mobility and flexibility over time.



Ground Force Plate Results

UC-II significantly increased peak vertical force by 25.6% ($p < 0.05$) and impulse area by 72.3% ($p < 0.05$) compared to baseline after 150 days.

- UC-II increased peak vertical force by 13-times compared to placebo
- UC-II increased peak vertical force by 2.6-times compared to glucosamine + chondroitin
- UC-II increased impulse area by 3-times compared to glucosamine + chondroitin



- While an increase was seen as early as 30 days, UC-II significantly increased peak vertical force by 8.8% and impulse area by 60.5% at 90 days
- Glucosamine + chondroitin did not significantly increase peak vertical force or impulse area at any time point

Source: R. C. Gupta et al. ; Journal of Animal Physiology and Animal Nutrition 2011



AyuFlex™ is a clinically proven organic product for joint health. It is derived from edible fruits of Terminalia chebula, an ancient Ayurvedic plant and standardized to high levels of bioactives. It has been used in India for thousands of years for its anti-inflammatory and analgesic effects without the adverse effects that are associated with acetaminophen and NSAIDs.



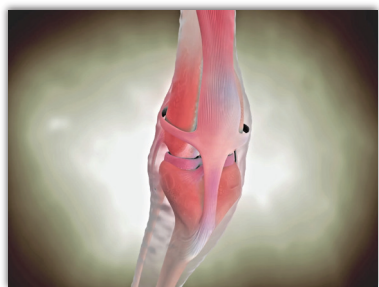
BiovaPlex® is a product developed from hydrolyzed Egg Shell Membrane (ESM).

ESM has been shown to reduce both pain and stiffness in human and veterinary osteoarthritic patients. A randomized controlled study revealed a significant decrease in proinflammatory cytokines after oral supplementation with ESM. No side effects have been attributed to ESM in human or veterinary patients.**



VitaBerry is a proprietary blend of berry extracts and acts as a potent antioxidant. Antioxidant effects are measured by Oxygen Radical Absorbance Capacity (ORAC). VitaBerry has the highest ORAC available in a veterinary product.

Non steroidal anti-inflammatory drugs or NSAIDS alleviate pain and inflammation by blocking the metabolism of arachidonic acid. Although they are



relatively safe and effective, serious side effects can occur. The use of nutritional

supplements and herbal products may help to decrease the NSAID dose and/or duration of treatment. In some cases, NSAID usage may be discontinued. This multimodal approach can dramatically decrease the chance of side effects associated with chronic NSAID usage. ■

BiovaPlex Bioactive Compounds

Active Ingredients	Biological Activity
Elastin	Joint, Tissue, Skin and Vascular Elasticity
Desmosine/Isodesmosine	Joint, Tissue, Skin and Vascular Elasticity
Collagen	Support of Joint and Connective Tissue Health
Total Glucosaminoglycans (GAG)	Support of Joint and Connective Tissue Health
Transforming Growth Factor-Beta	Immune Regulation Cellular Proliferation / Differentiation
Calcium*	None*
Antioxidants	ORAC 448µm TE/gram

**The content of calcium in BiovaPlex is negligible, verifying minimal contamination of the product by components from the mineralized eggshell.*

Dr. Rose Lemarie is a native of Arkansas who currently makes her home in New Orleans, Louisiana. She received her DVM from Louisiana State University in 1991 followed by a rotating internship in Companion Animal Medicine and Surgery at the Virginia Maryland Regional College of Veterinary Medicine in Blacksburg, Virginia. Dr. Lemarie returned home to Louisiana where she completed her residency training in Veterinary Surgery and became a Diplomate of the American College of Veterinary Surgeons. In 2000, Dr. Lemarie cofounded Southeast Veterinary Specialists in Metairie, Louisiana where she served as the head of the Surgery department until 2016 when the business was acquired by MedVet Medical & Cancer Centers for Pets. Dr. Lemarie currently resides on the famed Bourbon Street in New Orleans with her husband and wire-haired dachshund (Andouille) and cat (Rice).

**Eggshell membrane in the treatment of pain and stiffness from osteoarthritis of the knee: a randomized, multicenter, double-blind, placebo-controlled clinical study

Kevin J. Ruff¹, Anne Winkler², Robert W. Jackson³, Dale P. DeVore⁴ and Barry W. Ritz⁵