

Study Shows Benefits of Hilmar PROtelyze™ Pet for Senior Dogs

*Proprietary Whey Formulation
Prevents Muscle Loss and
Inflammation in Older Canines*



HILMAR
INGREDIENTS®

Thanks to advances in nutrition and veterinary care, companion animals are living longer than ever. But the growing population of senior pets also brings challenges. Among those challenges are sarcopenia (muscle loss) and cachexia (unexpected weight loss),^{1,2} which are common in aging canines and can lead to reduced mobility, poorer quality of life and earlier death.

Pets who are physically active and get adequate high-quality protein throughout their lives tend to have greater muscle mass, and this may protect against sarcopenia and cachexia as they grow older.³ Hilmar Ingredients wanted to find out how whey proteins might improve the health of aging dogs.

Hilmar Ingredients commissioned a 26-week study to evaluate the effects of Hilmar **PRO**telyze™ Pet, a proprietary formulation of whey protein from sweet dairy whey, on body composition and inflammation in senior dogs. The results suggest that formulating Hilmar **PRO**telyze Pet into dog food and treats may improve body composition and reduce inflammation as canines age.

Why Whey

Hilmar Ingredients has been developing advanced whey protein products for humans since its founding in 2004. Dairy whey is a source of high-quality, easily digestible proteins that is widely used in human nutrition products. Notably, much of the support for whey protein's nutritional benefits originated in animal studies. But despite the proven benefits, whey protein products have been underutilized in pet foods and treats.

Hilmar **PRO**telyze Pet is derived from whey protein, which has been shown in multiple studies to provide benefits to both humans and animals through:

- Branched-chain amino acids, which have been shown in human studies to prevent muscle wasting⁴ and promote muscle synthesis and repair.^{5,6}



- Biological peptides that support cardiovascular function. These include peptides that inhibit angiotensin-converting enzyme (ACE), a compound involved in making blood vessels more narrow and raising blood pressure.⁷
- A protein that supports the animal's body in breaking down fat as an energy source during exercise.⁸
- Peptides and proteins from whey with immune modulating effects—meaning they help to protect against infection and inflammation.
- Rich amino acids with antioxidant properties.⁹

Because the proteins in Hilmar PROtelyze Pet are “predigested”—broken down into their component peptides—a dog's body absorbs these nutrients more easily, enabling greater benefit.

Study Design

Three groups of 12 Labrador Retrievers each were fed a base diet that met AAFCO crude protein requirements (45 grams/1,000 kcal, or 18 percent of calories), supplemented with one of the following according to their group assignment:

- Hilmar PROtelyze Pet
- Hydrolyzed pea protein isolate
- Carbohydrates and lipids to equal the calories consumed by the other two groups

The three groups had similar calorie intakes and an exercise regimen of two runs each week. On the runs, dogs' distance and activity level was monitored and recorded at various intervals throughout the course of the 26-week study.

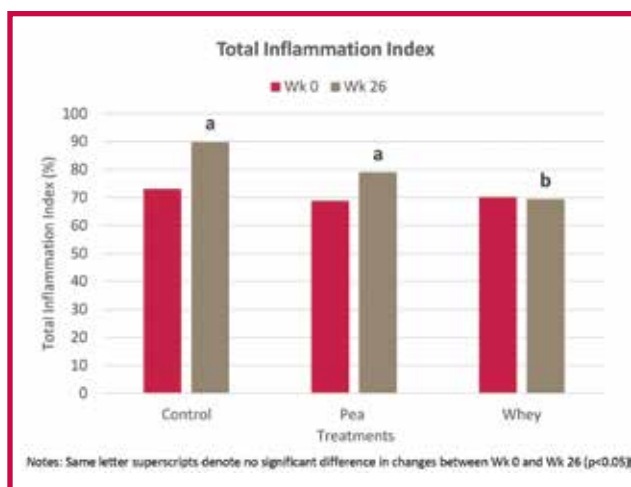
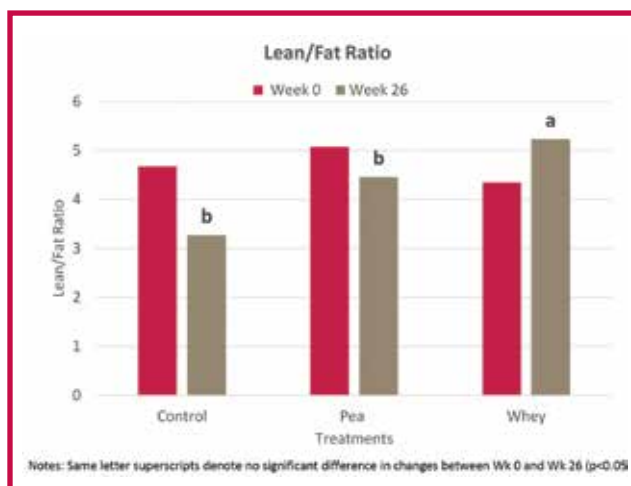
Study Results

The Hilmar PROtelyze Pet group performed better in several areas than both the groups fed pea protein isolate or a standard protein-rich diet. After 26 weeks, the dogs that received Hilmar PROtelyze Pet had:

- **Significantly higher lean body mass.**
- **Higher lean-to-fat ratio** than the other two groups. This

group was also the only one where the dogs' lean-to-fat ratio increased over the course of the study.

- **Higher activity levels** without increased general inflammation.
- **Significantly better gait scores.** A lower Total Inflammation Index indicates lower inflammation. While the other two groups saw an increase in their score, the Hilmar PROtelyze Pet group had no increase. This is especially remarkable because the Hilmar PROtelyze Pet group produced the highest level of activity during their exercise runs, which would normally be expected to increase inflammation.
- **Lower levels of all measured inflammatory biomarkers** associated with sarcopenia.
- **Higher plasma taurine** indicates that the Hilmar PROtelyze Pet group may have improved heart function.



These findings indicate that a diet supplemented with Hilmar PROtelyze Pet, along with regular exercise, may help dogs sustain muscle mass and mobility as they age, improving senior dogs' quality of life. In tandem with other studies, they suggest that starting supplementation early on may help prevent or slow the inflammation and loss of muscle that becomes more common as canines age.

Potential Uses of Hilmar PROtelyze Pet in Canine Diets

Hilmar Ingredients is prepared to work with formulators to offer the proven benefits of Hilmar PROtelyze Pet to man's best friend.

Hilmar PROtelyze Pet may be used to develop a canine supplement for muscle recovery, as well as be incorporated into dog food and treats to support strength and mobility in middle-aged and senior dogs. As part of formulations, Hilmar PROtelyze Pet's high digestibility, complete protein profile and higher performance in supporting lean mass make it an attractive alternative to hydrolyzed pea protein isolate.

In addition to its nutritional benefits, Hilmar PROtelyze Pet provides functional properties for use in a variety of canine food and treats, such as heat stability and high solubility. It is AAFCO approved, compliant for use in the United States and the European Union and Hilmar Ingredients' facilities are SQF certified as part of GFSI.

Pet owners will appreciate that Hilmar PROtelyze Pet is an ingredient that is made in the United States, non-GMO, rBST free and certified as kosher and halal.

About Hilmar Ingredients

Hilmar Ingredients' mission is to improve lives—not just for humans, but also for our pets. We partner with consumer marketers and research organizations around

the world to unlock the life-changing power of protein. We're discovering new applications, co-creating highly differentiated products and accelerating innovation processes in a wide range of markets, including early life nutrition, healthy living nutrition, sports and performance nutrition and pet nutrition. Our company is also one of the world's largest cheese manufacturers, ensuring that our customers can count on unmatched product availability, product quality and supply chain resilience. In addition to state-of-the-art quality assurance systems, our processing plants are built with next-generation sustainability technologies, which has Hilmar Ingredients—and the dairy industry as a whole—on a clear path to carbon-neutrality.

¹Freeman L.M. (2018) Cachexia and sarcopenia in companion animals: An under-utilized natural animal model of human disease. *JCSM Rapid Communications*. 1(1-17).

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³Lafamme D. (2018) Effect of diet on loss and preservation of lean body mass in aging dogs and cats. *Gerontology: An Inside Out Perspective*. May 3-5, 2018: *Companion Animal Nutrition Summit*. 45-48.

⁴Ko C.H., Wu S.J., Wang S.T., Chang Y.F., Chang C.S., Kuan T.S., Chuang H.Y., Chang C.M., Chou W., Wu C.H. (2020) Effects of enriched branched-chain amino acid supplementation on sarcopenia. *Aging* 12(15091-15103).

⁵West D.V.D., Abou Sawan S., Mazzulla M., Williamson E., Moore D.R. (2017) Whey protein supplementation enhances whole body protein metabolism and performance recovery after resistance exercise: A double-blind crossover study. *Nutrients* 9(735).

⁶Davies R.W., Carson B.P., Jakeman P.M. (2018) The Effect of Whey Protein Supplementation on the Temporal Recovery of Muscle Function Following Resistance Training: A Systematic Review and Meta-Analysis. *Nutrients* 10(221).

⁷Tavares T., Sevilla M.Á., Montero M.J., Carrón R. and Malcata F.X. (2012) Acute effect of whey peptides upon blood pressure of hypertensive rats, and relationship with their angiotensin-converting enzyme inhibitory activity. *Mol. Nutr. Food Res*. 56(316-324).

⁸Bouthegourd J. J., Roseau S. M., Makarios-Lahham L., Leruyet P.M., Tome D.G., and Even P.C. (2002) A preexercise α -lactalbumin-enriched whey protein meal preserves lipid oxidation and decrease adiposity in rats. *Am. J. Physiol. Endocrinol. Metab*. 283(E565 - E572).

⁹Colovic, M. B., Vasic, V. M., Djuric, D. M., & Krstic, D. Z. (2018) Sulphur-containing amino acids: protective role against free radicals and heavy metals. *Current Medicinal Chemistry*. 25(324-335).

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