



RESEARCH REPORT

# HYDRO-P PREMIUM AND ITS ROLE IN IMPROVING MOBILITY



BIO-FUNCTIONAL  
**HYDRO-P PREMIUM**



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INGREDIENTS

# HYDRO-P PREMIUM

Hydro-P Premium is a collagen hydrolysate developed to deliver multiple health benefits for dogs and cats. Collagen hydrolysate is a bioactive ingredient known to promote mobility and well-being. Their effectiveness is proven through in-vitro and in-vivo research. The aim of our studies was to assess the effectiveness of Hydro-P Premium on different indicators of mobility and inflammation in dogs with osteoarthritis.

## OSTEOARTHRITIS AFFECTS MANY PETS

Osteoarthritis (OA) is a common cause of lameness. Lameness arises due to a combination of joint pain and restricted range of motion. Lameness in dogs and cats with OA may also be associated with joint instability. Instability of the stifle from cruciate ligament rupture is particularly common. OA is a degenerative condition with an inflammatory component. A key feature of OA is loss of hyaline articular cartilage from the affected joint. Commonly affected joints in the dog and cat include the hip, elbow, and stifle.

- The prevalence of OA in dogs aged > 1 year is 20%, rising to 80% in dogs aged > 8 years<sup>1</sup>
- The prevalence of OA in all cats is 40%, rising to 90% in cats aged > 12 years<sup>2</sup>

## STUDY 1 COLLAGEN HYDROLYSATE BENEFITS THE MOBILITY OF DOGS WITH OSTEOARTHRITIS

### METHODOLOGY

In this study, 30 privately owned dogs with signs of osteoarthritis were recruited through local announcements by breed associations and through veterinarians. The dogs were assigned to either the placebo or the treatment group. Dogs were distributed between the groups by assessing the severity of lameness to achieve similarity in both groups. An 8-week, double-blind, placebo-controlled trial was then performed. During the investigation, the dogs (N=30, 15 per treatment group) received either 20g of soy protein hydrolysate (a placebo) or 10g of soy protein isolate mixed with 10g of collagen hydrolysate each day. The supplement and placebo were served as a top dressing over a meal. This would reflect an inclusion level of approximately 2.5% in a dog food. Dog owners were requested to score their dogs weekly on a scale from 0 to 10 for different aspects (activity, stiffness, lameness, and pain).

The coordination of the trial, the selection of the dogs, the maintenance of communication with the dog owners, the delivery of food and supplements, and the collection of the data were all performed by two scientists who were kept blinded as to the treatment modality.

### TRIAL QUESTIONNAIRE

The trial questionnaire was in the form of a notebook with attached instructions. The dog owners graded the severity of the signs of osteoarthritis of their dogs by marking a cross on a horizontal line 10cm wide. The line did not contain any units, but functioned as a scale in combination with the description and supporting questions. The mobility of each dog was scored at the beginning of the trial (day 0) and weekly from then on. The description of mobility assessment and supporting questions are as follows:

**"Activity" (vitality):** The scale ranged from "Not active" (left) to "Very active" (right)

- How active is your dog?
- Is your dog capable of playing?
- Does your dog reach the door earlier than you?
- Is your dog excited when you are taking her/him somewhere?

**Stiffness:** The scale ranged from "Very stiff" (left) to "Smooth" (right)

- How stiff is your dog?
- Does your dog easily get out of its bed in the morning or does it take time to get started when going for a walk?

**Lameness:** The scale ranged from "Very lame" (left) to "Not lame" (right)

- Is your dog lame or does it not use one leg at all?
- Watch your dog carefully to ascertain whether or not there is a change of the degree of lameness during the "trial".

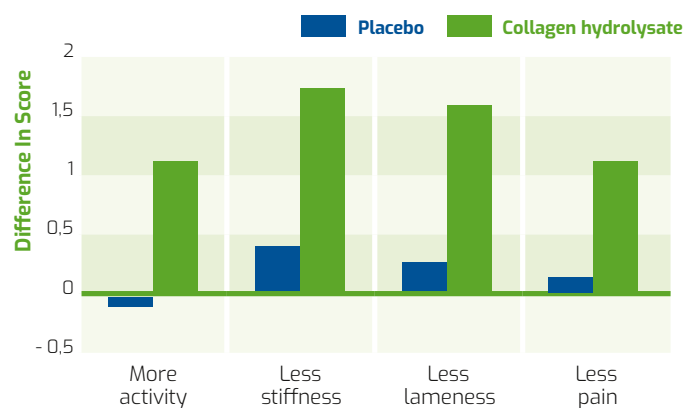
**Pain:** The scale ranged from "Usually an expression of pain" (left) to "Never an expression of pain" (right)

- Does the osteoarthritis cause pain in your dog?
- Does your dog growl or scream when she/he gets up or makes a wrong movement?
- Does your dog indicate pain or does she/he try to bite when you touch certain joints?<sup>3</sup>

### RESULTS

Comparison of the score on week 8 in comparison to the beginning showed a significant improvement in the scores for activity, stiffness and lameness for those dogs receiving daily collagen hydrolysate (Figure 1). The improvement in pain reduction tended to reach statistical significance ( $p = 0.13$ ).

Figure 1. Improvement In Mobility



Supplementing dogs with collagen hydrolysate soothes the symptoms of osteoarthritis and reduces stiffness, lameness and pain.

## STUDY 2 HYDRO-P PREMIUM REDUCES INFLAMMATION AND IMPROVES MOBILITY IN DOGS WITH OSTEOARTHRITIS

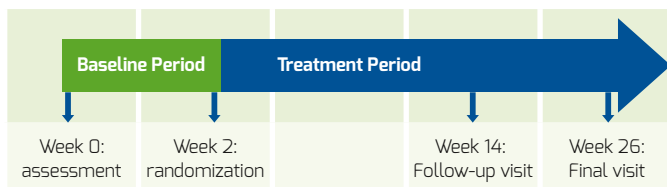
### METHODOLOGY

In this study, 16 privately-owned dogs with OA-associated pelvic limb lameness were enrolled in a 26-week, double-blind, randomized, placebo-controlled study. After a 2-week baseline period, 8 dogs were randomly assigned to a collagen hydrolysate (Hydro-P Premium) treatment group and 8 to a hydrolyzed gluten placebo group and treated orally for 24 weeks at 0.3g/kg/day. Follow-up examinations were performed at weeks 14 and 26.

Outcome measures at each visit:

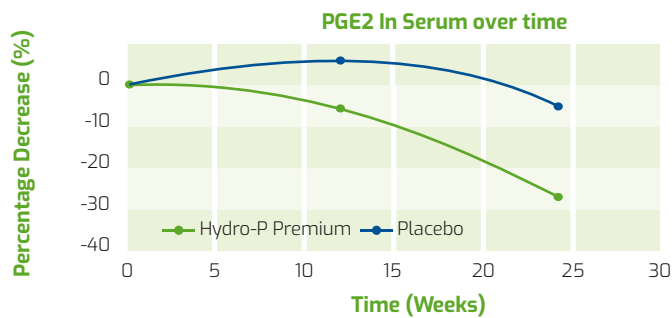
- Force Platform Gait Analysis
- Prostaglandin E2 (PGE2) level in osteoarthritic joint

Figure 2. Experiment timeline



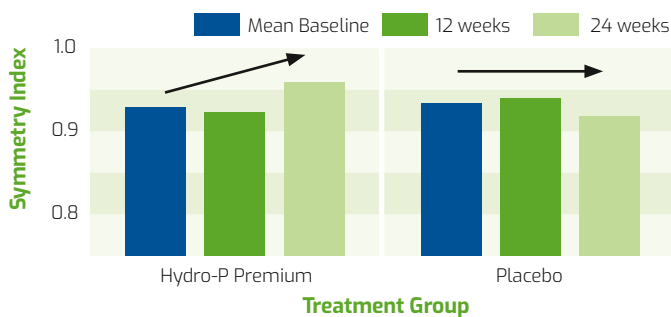
### RESULTS

Figure 3. Inflammation Level in Serum



A clear decrease in Prostaglandin E2 (PGE2, an inflammation marker) in serum at 12 and 24 weeks demonstrates a reduction of inflammation<sup>4</sup>

Figure 4. Peak Vertical Force Symmetry Index



The Peak Vertical Force Symmetry Index from the Force Platform Gait Analysis measured at 12 and 24 weeks is an indication for improvement in mobility in dogs supplemented with Hydro-P Premium<sup>4</sup>

### DISCUSSION STUDY 1 & 2

In the first study, supplementing dogs with collagen hydrolysate significantly improved the characteristics of mobility such as activity (vitality), stiffness and lameness (Figure 1). On a scale of 0 to 10, the increase of investigated parameters (after correction for placebo) were 1.35, 1.38 and 1.45, respectively. The corrected decrease in pain was 0.923.

In the second study, the average PGE2 results in the group supplemented with Hydro-P Premium showed a greater decrease vs. placebo, indicating a suppression of inflammation in the group treated with Hydro-P Premium (Figure 3). Furthermore, the average mobility (pressure gait analysis - symmetry limb results) outcomes indicate a slight improvement effect in the supplemented group<sup>4</sup> (Figure 4).

These observations on lameness support the results obtained by Weide<sup>5</sup>, who performed an open, non-controlled trial. In Weide's investigation, over the period of 4 months, 20 dogs received a daily supplement of 20g of collagen hydrolysate as an addition to their regular food. At the end of the trial, a decrease in the severity of lameness was detected. On the scale of 0-4, the severity score dropped from an initial value of 1.73 to 0.84. When transforming those results into a scale of 0-10, the outcomes are similar to the results presented in this research report. Furthermore, human studies with osteoarthritis have also demonstrated a decrease in pain and functional improvement after supplementing the diet with collagen hydrolysate<sup>6,7</sup>.

Collagen in the cartilage matrix and collagen hydrolysate are characterized by a very similar amino acid composition. Research in mice proved that after supplementing mice with radiolabelled collagen hydrolysate, the radioactivity was specifically detected in cartilage<sup>8</sup>. Another study conducted by Lippiello demonstrated that the amino acids from collagen hydrolysate stimulated the synthesis of collagen cartilage<sup>9</sup>. The reduction in lameness in the Weide<sup>5</sup> study was associated with increased levels of glycine, proline and hydroxyproline, and a lower concentration of Matrix Metalloproteinase-3 (MMP-3) in blood. MMP-3 takes part in collagen degradation in the cartilage matrix, which suggests that the positive effect of collagen hydrolysate is an inhibition of collagen degradation in the cartilage matrix. It is also possible that the reduction in lameness is related to a decrease of inflammation and pain.

Supplementing arthritic dogs with Hydro-P Premium helps to reduce inflammation and improve mobility.



## CONCLUSION

The significant improvement of clinical signs detected in dogs with osteoarthritis in the groups supplemented with collagen hydrolysate can be interpreted as being of clinical relevance. The decrease in PGE2 in combination with the increase in symmetry limb values may be an indication for OA improvement / inflammation reduction caused by the inclusion of Hydro-P Premium in the diet.

## REFERENCES

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The communication to the end user is the responsibility of the pet food producer.

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Operating on a unique residuals-to-resources concept, Sonac develops bio-functional, techno-functional and nutritional ingredients that benefit the pet food industry, pet owners and pets. We operate at the intersection of these three different stakeholders' worlds.

We are a leading producer of reliable, sustainable ingredients worldwide, with representation on 4 continents and activities in 60 different locations. As a dependable one-stop shop for smart, volume-driven, ingredient solutions, our constant aim is to help manufacturers improve recipes and reach the highest levels of quality and environmental performance.

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