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### **Ovopet (eggshell membrane), a new ingredient to treat hip dysplasia in dogs**

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#### **Purpose of presentation**

The aim of the presentation is to make known an innovative, natural and efficient eggshell-derived ingredient (Ovopet) for relieving pain and inflammation of joints. The ingredient helps to maintain the health and the correct functionality of joints and improves the quality of life of osteoarthritic pets. It can be introduced in diverse formats such as capsules, tablets, dry pet food, wet pet food and snacks.

#### **Take-home points**

- Eggshell membrane (Ovopet) is an innovative, natural and safe ingredient for dogs' joint health.
- Ovopet significantly reduces the inflammation of the synovial membrane and the serum levels of inflammatory blood markers.
- The functional limitation associated to joint problems declines and the quality of life of pets increases.
- No side effects associated to the intake of Ovopet were described
- The ingredient can be introduced in different formats such as capsules, tablets, dry and wet petfood and snacks among others.

#### **Abstract**

Hip dysplasia is highly prevalent in dogs <sup>(1)</sup>. Osteoarthritis (OA) of the hip is the result of the degeneration of the joint due to a laxity caused by hip dysplasia <sup>(1)</sup>. Dogs of all ages are subject to hip dysplasia and the resultant OA. Some clinical studies have highlighted the beneficial effects of dietary supplement for the treatment of OA in dogs <sup>(2)</sup>.

Ovopet is an innovative eggshell-derived ingredient and a unique biological matrix that is composed of collagen type I (around 30%), glycosaminoglycan (such as chondroitin and hyaluronic acid around a 6%) and sulphur-bearing amino acids (with a high proportion of methionine and cysteine), among other bio-ingredients, that has led to the consideration of this product as a potential treatment for osteoarthritis as shown in a previous study <sup>(3)</sup>. The goal of the present study is to assess the effectiveness of Ovopet in the treatment of hip dysplasia and the consequent osteoarthritis in dogs.

A group of adult osteoarthritic dogs (63% female) were used in this study. Their average age was  $8 \pm 0.56$  years) and their weight ranged from 15 to 40 Kg ( $34 \pm 1.05$  Kg). All dogs had radiographic evidence of hip dysplasia. A randomized and double-blind with placebo study was carried out in cooperation with two veterinary clinics. Two groups of patients were established, one taking the chondroprotective supplement with Ovopet ( $15 \text{ mg Kg}^{-1} \text{ dog day}^{-1}$  in a snack prepared by a pet food manufacturer) (N=30) and the other group taking a placebo supplement (same recipe without Ovopet) (N=10). OA degree (from 1 to 4) was classified using the Kellgren-Lawrence grading scale as previously described <sup>(4)</sup>. Treatment lasted 40 days and veterinary monitoring was performed every 10 days assessing functional limitation and joint mobility (hip functional scale), muscular atrophy and mobility range (extension-flexion rating). Dogs were also examined for blood analysis (inflammatory markers) and echography of the hip joint space before and at the end of the study. Performances in daily life activities and vitality assessed by the owners were also recorded.

All participants completed the study. In dogs with hip dysplasia, lack of activity due to pain weakens the muscles hastening muscular atrophy. A gradual improvement in the muscular perimeter in the group treated with Ovopet was observed along the study reaching a significant improvement of 7.3% in the right and 8.9% in the left rear legs after 40 days of treatment. Range of motion is other useful parameter to assess osteoarthritis degree. We have observed a significant improvement in the range of motion as Ovopet treatment significantly decreased the flexion angle and increased the extension angle. Dogs treated with placebo not only did not showed any of these improvements but suffered a significant increase in the flexion angle of both legs. Hip functional scale is an assessment scale widely used to quantify the degree of osteoarthritis. After evaluating the functional limitation punctuation, we have detected a significant improvement in all the parameters assessed after the treatment with Ovopet while the dogs treated with placebo did not show a significant improvement at any time point.

Regarding the joint mobility, the pain at manual mobilization of the hip, the pain during palpation and the pain during movement were the parameters assessed by the veterinarians. In the group treated with Ovopet there was a gradual decrease in pain since day 10 until the end of the study. In the evaluation questionnaire with the owner there were different questions in relation to the general activity of the dog, ability to walk, to run, etc. At the end of the study there was a 5,6% of improvement in the description of function in the treated dogs compared with the placebo group and the pain that the owner thinks that his/her dog suffers declines 46,9% in the treated dogs at day 40 compared to day 0. The anti-inflammatory blood marker Nitric oxide was analyzed before and after the treatment, showing an increase of 83,6% in the placebo group. The performed ecography at day 0 and 40 showed a significant decrease in the hip joint space in the dogs treated with Ovopet while in the placebo group the joint space was maintained or increased. The improvement in the synovitis at the end of the study was of 19,6 and 24% in the right and left legs of Ovopet treated dogs respectively. The possible side effects related to the treatment were assessed in each veterinary visit. No significant side effects were seen during the treatment with Ovopet.

All together, Ovopet administration has proved efficacy in ameliorating muscular atrophy as it significantly increased the rear legs perimeter. A decline in pain was also assessed in the dogs treated 40 days with Ovopet. The detailed behavior-based assessment performed by the owner showed significant improvements only in the Ovopet treated group while in the dogs treated with placebo, all these parameters remained stable or even worsened. The hip joint space was statistically narrowed in Ovopet treated dogs.

## **Conclusion**

Ovopet is a safe and highly effective ingredient for relieving pain and reducing joint inflammation. The supplementation with this eggshell-derived ingredient is well tolerated, produces a significant reduction in joint pain symptoms while improves the physical function. The quality of life of dogs with hip dysplasia is increased. Ovopet arises as an innovative, effective and natural raw material for dogs' joint health.

## **References**

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## **Lead author's/speaker's biography**

Erena Gil-Quintana is technician in the Quality and R&D Department of Egnovo S.L.

Egnovo is a technology-based company that develops and produces innovative, natural, sustainable and highly effective eggshell-derived raw materials for the pet food industry. Egnovo, in collaboration with academic and private partners, has carried out diverse clinical studies to demonstrate the health benefits of eggshell-derived products.

She obtained a degree in Biology, followed by a master's degree and doctorate in Environmental Agrobiology from the Public University of Navarre, Spain. She started her career at Egnovo in research and development. During this time, she has performed several studies to prove the efficacy of the innovative raw materials derived from eggshell in humans and in dogs. Egnovo has been focused in assessing the efficacy of Ovopet® (eggshell membrane for pet food) in dog's joints health and functionality. Studies about the absorption rate and the cartilage regeneration ability have also been performed.

## **Lead author's/speaker's contact information**

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