

All About Feed 2017; 25/1: 42.

Anton C. Beynen

Mobility dog foods are based on wobbly evidence

Mobility impairment due to osteoarthritis is a common canine disease. Affected dogs are reluctant to walk and may show symptoms of chronic pain and lameness. Osteoarthritis is a degenerative and inflammatory condition caused by degradation of cartilage matrix in joints. The marketplace offers a wide variety of mobility dog foods claiming to support joint health. Veterinary mobility foods are indicated for treatment of canine osteoarthritis.

The mobility claims are linked to supplements (functional ingredients) from a pool of some 13 ostensible candidates. Effective supplements provoke better joint function in dogs than a placebo as substantiated by meaningful, statistically significant and reproducible effects. So far, efficacy evaluation comprised treatment rather than prevention of osteoarthritis. Clinical trials must be double-masked to neutralize the generally observed placebo effect in dogs with osteoarthritis.

The most commonly used additions, glucosamine and chondroitin sulfate, were ineffective in four out of five double-blinded, placebo-controlled trials in osteoarthritic dogs (1-5). In four such trials, greenlipped mussel had no or meaningless effect (1, 6-8). Curcumin showed unconvincing efficacy in one study (9). Boswellia resin was only tested in an open, non-controlled trial (10). Green tea alone, methyl sulfonyl methane, devil's claw, mulberry and grape extracts are untested in dogs.

Four randomized, double-blind, placebo-controlled trials have assessed the impact of dietary fish oil on the severity of clinical signs in osteoarthritic dogs (11-14). On a 0-10 scale, the mean placebo-corrected improvements were 0.1, 0.4, 0.8 and 4.2 units so that clinical relevance is open to dispute. Gelatin hydrolysate and beta-1,3/1,6-glucans had positive effects of 1.3 and 0.5 units (15, 16), but reproducibility is unknown. The three substances likely have different mechanisms of action, implying that the combination works synergistically, but this remains to be demonstrated.

Fish oil, gelatin hydrolysate and beta-1,3/1,6-glucans each showed a small, positive effect on osteoarthritic signs. Does the effect size seen experimentally extend to that of mobility foods carrying the ingredients concerned? In other words, are preparation and dosing identical for trial and food, and does functionality survive petfood processing? These questions may be answered by the petfood manufacturer.

Literature

1. Dobenecker B, Beetz Y, Kienzle E. A placebo-controlled double-blind study on the effect of nutraceuticals (chondroitin sulfate and mussel extract) in dogs with joint disease as perceived by their owners. *J Nutr* 2002; 132: 1690S-1691S.
2. Moreau M, Dupuis J, Bonneau NH, Desnoyers M. Clinical evaluation of a nutraceutical, carprofen and meloxicam for the treatment of dogs with osteoarthritis. *Vet Rec* 2003; 152: 323-329.

3. Blanchard G, Dentz JJ, Paragon B-M. The placebo effect of a supplement provided to dogs with signs of arthrosis: a double-blind clinical trial in dogs. 10th Congress of the European Society of Veterinary and Comparative Nutrition 2006: pp 163-164.
4. D'Altilio M, Peal A, Alvey M, Simms C, Curtsinger A, Gupta RC, Canerdy TD, Goad JT. Therapeutic efficacy and safety of undenaturated type II collagen singly or in combination with glucosamine and chondroitin in arthritic dogs. *Toxicol Mech Meth* 2007; 17: 189-196.
5. Gupta RC, Canerdy TD, Lindley J, Konemann M, Minniear J, Carroll BA, Hendrick C, Goad TD, Rohde K, Doss R, Bagchi M, Bagchi D. Comparative therapeutic efficacy and safety of type-II collagen (uc-II), glucosamine and chondroitin in arthritic dogs: pain and evaluation by ground force plate. *J Anim Physiol Anim Nutr* 2012; 96: 770-777.
6. Bierer TL, Bui LM. Improvement of arthritic signs in dogs fed green-lipped mussel (*Perna canaliculus*). *J Nutr* 2002; 132: 1634S-1636S.
7. Hielm-Björkman A, Tulamo R-M, Salonen H, Raekillio M. Evaluating complementary therapies for canine osteoarthritis Part I: Green-lipped mussel (*Perna canaliculus*). *eCAM* 2009; 6: 365-373.
8. Pollard B, Guilford WG, Ankenbauer-Perkins KL, Hedderley D. Clinical efficacy and tolerance of an extract of green-lipped mussel (*Perna canaliculus*) in dogs presumptively diagnosed with degenerative joint disease. *N Z Vet J* 2006; 54: 114-118.
9. Innes JF, Fuller CJ, Grover ER, Kelly AL, Burn JF. Randomised, double-blind, placebo-controlled parallel group study of P54FP for the treatment of dogs with osteoarthritis. *Vet Rec* 2003; 152: 457-460.
10. Reichling J, Schmökel H, Fitz J, Bucher S, Saller R. Dietary support with Boswellia resin in canine inflammatory joint and spinal disease. *Schweiz Arch Tierheilk* 2004; 146: 71-79.
11. Roush JK, Cross AS, Renberg WC, Dodd CE, Sixby KA, Fritsch DA, Allen TA, Jewell DE, Richardson DC, Leventhal PS, Hahn KA. Evaluation of the effects of dietary supplementation with fish oil omega-3 fatty acids on weight bearing in dogs with osteoarthritis. *J Am Vet Med Assoc* 2010b; 236: 67-73.
12. Hielm-Björkman A, Roine J, Elo K, Lappalainen A, Junnila J, Laitinen-Vapaavuori O. An un-commissioned randomized, placebo-controlled double-blind study to test the effect of deep sea fish oil as a pain reliever for dogs suffering from canine OA. *BMC Vet Res* 2012; 8: 157.
13. Moreau M, Troncy E, Del Castillo JRE, Bédard C, Gauvin D, Lussier B. Effects of feeding a high omega-3 fatty acids diet in dogs with naturally occurring osteoarthritis. *J Anim Physiol Anim Nutr* 2013; 97: 830-837.
14. Mehler SJ, May LR, King C, Harris WS, Shah Z. A prospective, randomized, double-blind, placebo-controlled evaluation of the effects of eicosapentaenoic acid and docosahexaenoic acid on the clinical signs and erythrocyte membrane polyunsaturated fatty acid concentrations in dogs with osteoarthritis. *Prostaglandins, Leukotrienes and Essential Fatty Acids* 2016; 109: 1-7.

15. Beynen AC, Van Geene HW, Grim HV, Jacobs P, Van der Vlerk T. Oral administration of gelatin hydrolysate reduces clinical signs of canine osteoarthritis in a double-blind, placebo-controlled trial. *Am J Anim Vet Sci* 2010; 5: 95-99.

16. Beynen AC, Legerstee E. Influence of dietary beta-1,3/1,6-glucans on clinical signs of canine osteoarthritis in a double-blind, placebo-controlled trial. *Am J Anim Vet Sci* 2010; 5: 90-94.