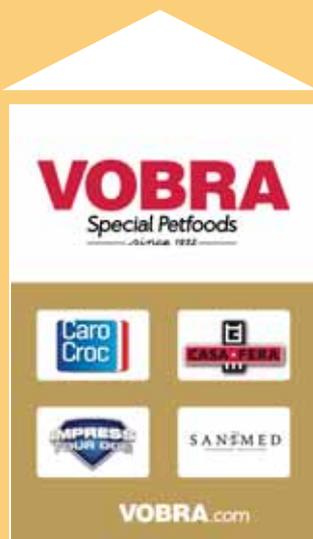




Dr A C Beynen was professor of veterinary nutrition at the Faculty of Veterinary Medicine, Utrecht University, The Netherlands in the period of 1993-2007.



Green-Lipped Mussel and Curcumin in Mobility Foods for Dogs

Mobility impairment is a common canine disease. Dogs are reluctant to walk, run and jump, and may show lameness. The cause often is breakdown of cartilage in joints. This implies loss of shock absorber that allows the joint to move smoothly. The ends of the bones begin to rub together, evoking pain. Damaged tissue elicits the release of inflammatory substances, contributing to pain and swelling of the joint. The condition is called osteoarthritis.

There are dog foods, snacks and nutritional supplements making joint-health claims, whereas therapeutic mobility foods purport to reduce clinical signs of osteoarthritis. These products are marketed on the basis of a wide variety of joint-protective constituents. Among these agents are powders derived from the New-Zealand green-lipped mussel and preparations of curcumin, which is a component of the yellow spice made from turmeric stem.

For demonstration of the efficacy of a potential joint-improving agent, a double-blinded, placebo-controlled trial in dogs with osteoarthritis is required. The placebo has no real effect and treatment identity is kept from both owner and investigator. In this way, the trial design takes into account the impact, if any, of biased evaluation and spontaneous course of disease. In placebo-treated dogs with osteoarthritis there often is perceived improvement over time.

Studies on the efficacy of green-lipped mussel either had inadequate design or unconvincing results for its application in the management of canine osteoarthritis. There is no comfortable evidence that mobility foods containing either green-lipped mussel or curcumin reduce clinical signs of osteoarthritis in dogs.

Green-lipped mussel and curcumin

Powdered preparations and oily extracts of the New Zealand green-lipped mussel (*Perna canaliculus*) have anti-inflammatory properties in model systems. In-vitro studies indicate that curcuminoid derivatives reduce inflammation and inhibit collagen degradation in cartilage. Thus, there are clues to a beneficial effect of green-lipped mussel and curcumin in the treatment of canine osteoarthritis, but solid evidence can only come from well-designed clinical trials.



Trials on green-lipped mussel

Oral administration of a green-lipped mussel preparation reportedly improved clinical signs in arthritic dogs (1), but the study was open and non-controlled. Putting green-lipped mussel powder on top of food or incorporating it into a treat significantly improved dogs' arthritis scores over 6 weeks (2). The dose was equivalent to 139 mg/MJ of metabolizable energy as calculated for a 35-kg dog. The two experiments are designated as double-blind and controlled, but no control topping was used and it is uncertain whether the control and test treats were indistinguishable. Moreover, the magnitude of the effects can be considered meaningless.

In a double-blinded, placebo-controlled study, oral delivery of green-lipped mussel extract (53 mg/MJ for 12 weeks) did not affect clinical signs in dogs with osteoarthritis (3). Another masked and

controlled trial showed that ingestion of freeze-dried green-lipped mussel (139 mg/MJ for 8 weeks) significantly improved mobility (4). The median improvement versus baseline was 1 on a 0-24 scale and 0.2 on a 0-10 scale for the assessment by veterinarians and owners, respectively. This calls into question the clinical relevance of the statistically significant increase in mobility.

A double-blinded, placebo-controlled trial concluded that oral treatment with a green-lipped mussel extract (139 mg/MJ for 8 weeks) improved the arthritis score in dogs with osteoarthritis (5), but the baseline scores for control and test group were different, whereas the negative slopes of the score time courses were similar. In an open, non-controlled study, the intake of green-lipped mussel oil was associated with less lameness in dogs with osteoarthritis (6).



Trials on curcumin

A complex mixture including curcumin (7) and an extract of two turmeric species (8) have been evaluated in canine osteoarthritis. The extract (17 mg curcumin plus desmethoxycurcumin/MJ for 8 weeks) was tested in a double-blind, placebo-controlled trial (8).

The investigators' and owners' overall assessments were in favour of curcumin, but lameness, pain on joint manipulation and kinetic gait pattern appeared unaffected. A high proportion (19/24) of curcumin-treated dogs emanated malodour through their

skin, urine or faeces. This effect may have compromised the blinded nature of the study.

Therapeutic mobility foods

Three studies (2, 9-11) have addressed the efficacy of a therapeutic mobility food containing green-lipped mussel. The kibbles were coated with freeze-dried powder at a final inclusion level of 0.3% (2, 9, 10). One study was open and uncontrolled (10). The other two studies were blinded, but had a longitudinal instead of parallel control (2, 9, 11) so that time effects cannot be excluded. An improvement of the dogs' arthritic scores was claimed (2, 9). Apart from the flawed study design, the improvement was 4 on a 0-196 scale, which is clinically irrelevant.

Dogs suffering from osteoarthritis were fed a therapeutic food supplemented with curcuminoids extract, hydrolysed collagen and green tea extract for 3 months (12). Clearly, curcumin was not the sole additive. The study was named double-blinded and placebo-controlled, but effective blinding is questionable. Curcumin probably coloured the test food yellow, stained the owners' hands and caused dogs to generate malodour. The therapeutic diet diminished some kinds of pain, but did not improve lameness and mobility. The study is wrongly cited in substantiation of the food's advertising slogan: "Visible improvements to mobility, activity and quality of life" (13).

List of references is available on request from the author (beynen@freeler.nl)

Dr Anton C Beynen writes this exclusive column on dog and cat nutrition every month. He is affiliated with Vobra Special Petfoods.