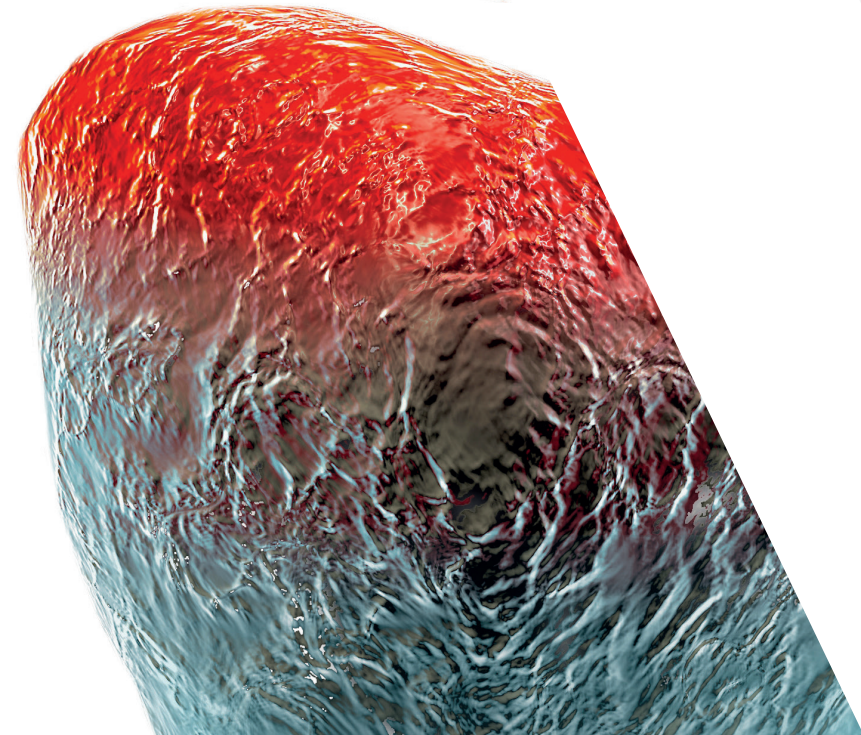
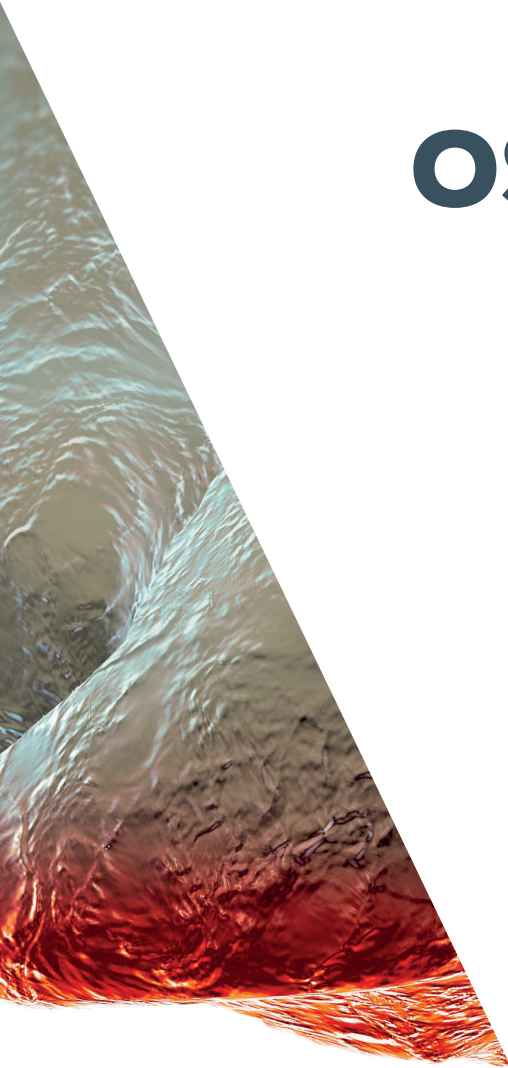


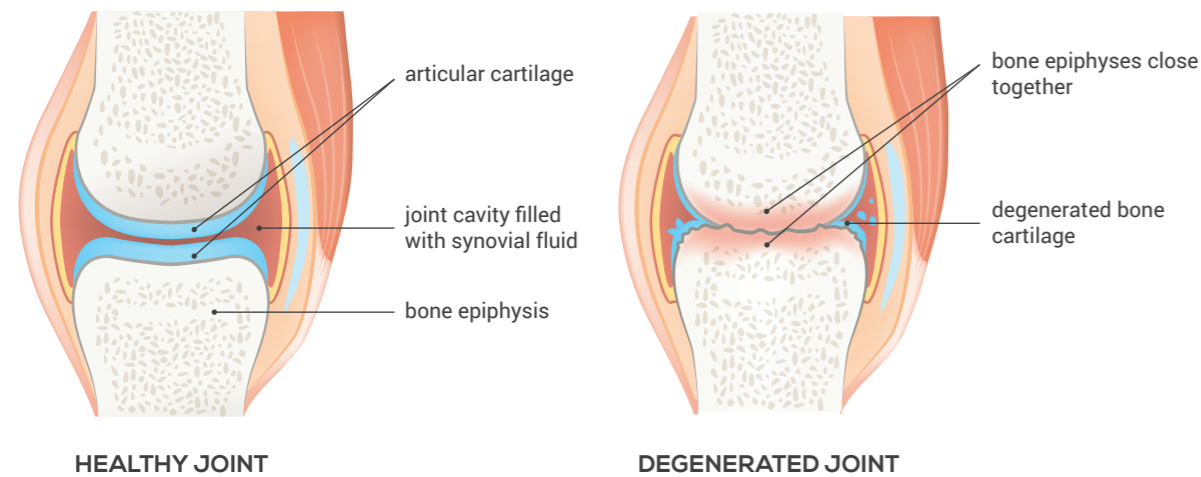
OSTEOARTHRITIS





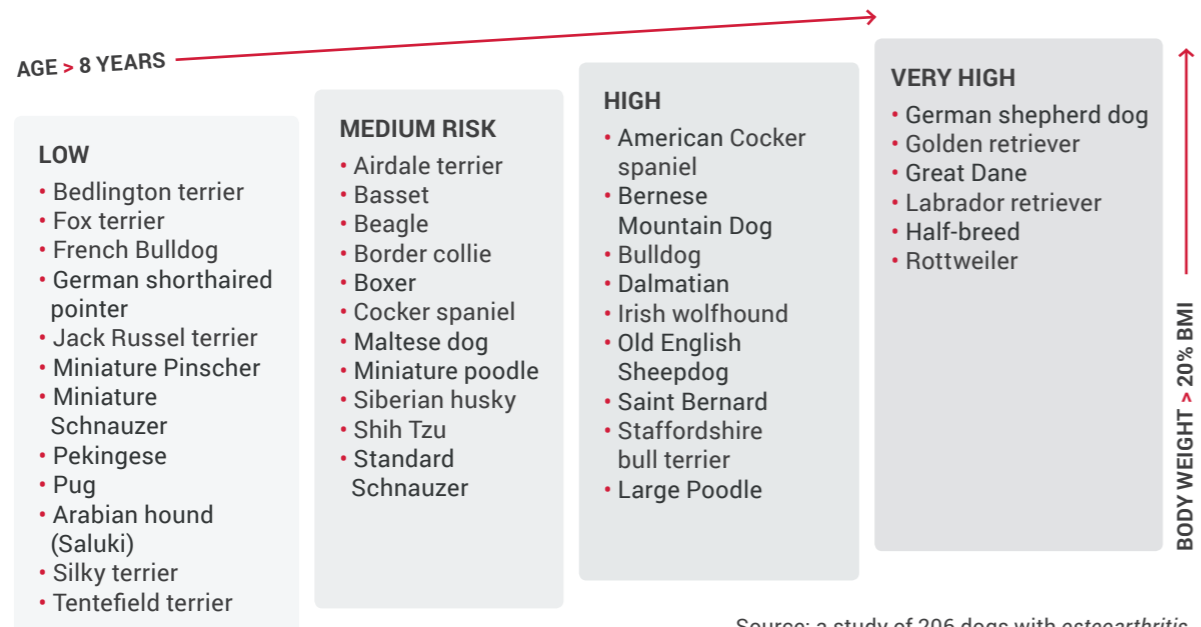
OSTEOARTHRITIS

Osteoarthritis is one of the most serious causes of the deterioration of the quality of life in adult and elderly dogs of large breeds. The damage of the articular cartilage leading to the development of inflammation, impairment of the ability to load the limbs and to the pain is, unfortunately, an irreversible process, whilst all the undertaken therapies aim solely at slowing down the disease development and mitigation of the existing clinical symptoms.



THE RISK FACTORS OF OSTEOARTHRITIS

The risk of developing osteoarthritis depends on the age and body weight of an animal. most frequently this condition affects elderly dogs of large and giant breeds.



Source: a study of 206 dogs with osteoarthritis.

THE CLINICAL COURSE OF OSTEOARTHRITIS

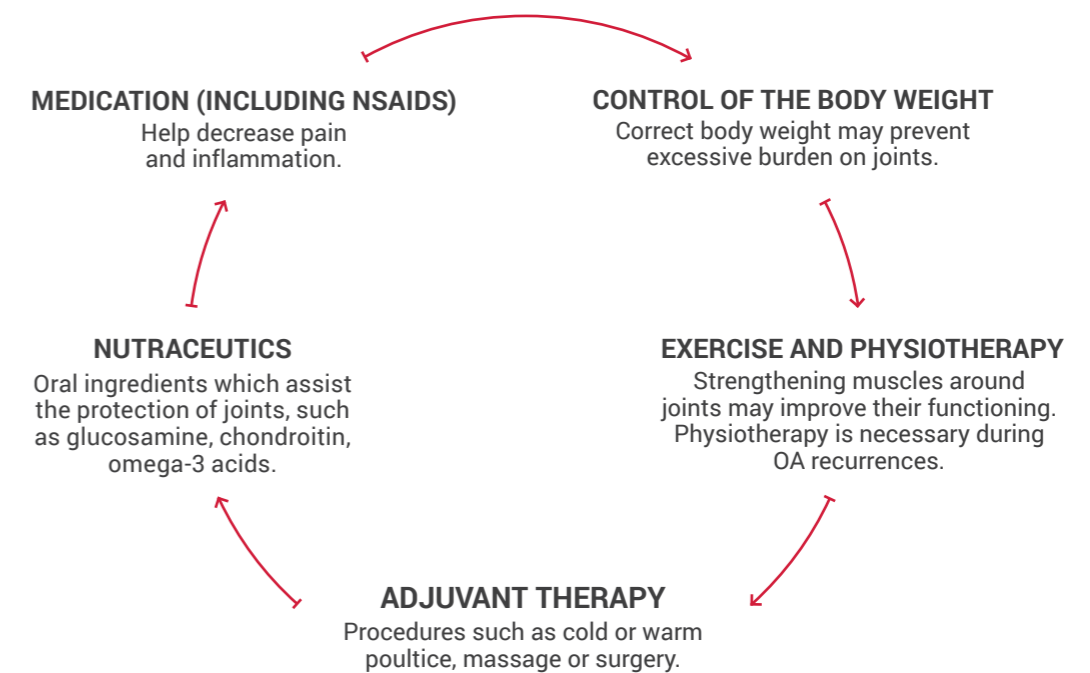
Articular degeneration in osteoarthritis progresses gradually and, as a result, the disease, initially mild, changes into a moderate and then severe one.

STAGE OF DISEASE	DOGS	CATS
MILD	<ul style="list-style-type: none"> • rigidity • decreased activity • lameness 	<ul style="list-style-type: none"> • decreased activity
MODERATE	<ul style="list-style-type: none"> • pain • muscle atrophy • difficulties in getting up 	<ul style="list-style-type: none"> • reluctance to jump up and to walk up the stairs • negligence of hygiene
SEVERE	<ul style="list-style-type: none"> • decrease of mobility • vocalization • lack of appetite • apathy • crepitation 	<ul style="list-style-type: none"> • ameness • muscle atrophy • urination problems

Source: Beale B., *Orthopedic problems in geriatric dogs and cats*, Veterinary Clinisc of North America: Small Animal Practise 2005, 35, 655-674.

MULTIMODAL TREATMENT OF OSTEOARTHRITIS

The main objective of every veterinarian is to counteract the deterioration of osteoarthritis. That is why, the treatment of patients with osteoarthritis involves a number of strategies in which the anti-inflammatory medication is only of one the options.



Source: Hazewinkel HA, van den Brom WE, Theyse LF, et al. *Comparison of the effects of firocoxib, carprofen, and vedaprofen in a sodium urate crystal induced synovitis model of arthritis in dogs*. Res Vet Sci. 2008;84:74-79.



For 10 years VetExpert has been producing high quality diagnostic tests, care products, veterinarian diets and supplements. All these products are used by thousands of veterinarians, animals carers and breeders in more than 20 countries. In Poland VetExpert is a trusted leader among veterinary doctors*. The product line supporting the joints, which makes up an important element in a multimodal approach to counteracting osteoarthritis. These products are nutraceuticals which contain ingredients with chondroprotective and anti-inflammatory action.

ACTIVE SUBSTANCES IN VETEXPERT PRODUCTS FOR JOINTS

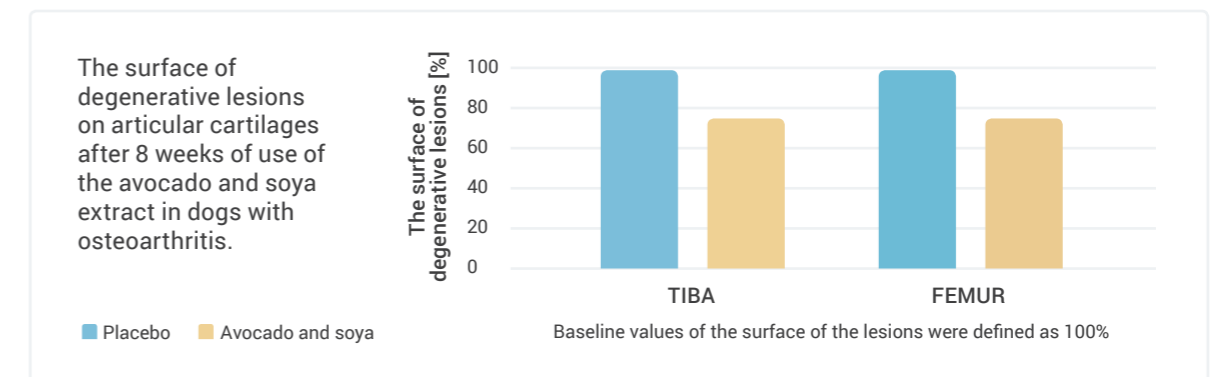
ACTIVE SUBSTANCE	FUNCTION	MECHANISM OF ACTION	PRODUCT
GLUCOSAMINE	Chondro-protective	A substance that takes part in the production of glycosaminoglycans which are necessary for the production of s extracellular matrix of articular cartilage.	<ul style="list-style-type: none"> • ArthroVet • ArthroVet Complex
CHONDROITIN	Chondro-protective	Anti-inflammatory action in articular cartilage is used for the production of extracellular matrix and guarantees the hydration of the cartilage thus providing for their pliability and resistance.	<ul style="list-style-type: none"> • ArthroVet • ArthroVet Complex • ArthroVet Complex SBC
HYALURONIC ACID	Chondro-protective	Chondroprotective action of hyaluronic acid in the joints consists first of all in the inhibition of apoptosis and stimulation of chondrocyte production; moreover it stimulates the synthesis of proteoglycans and glycosaminoglycans and has anti-inflammatory, mechanical and analgesic action.	<ul style="list-style-type: none"> • ArthroVet • ArthroVet Complex • ArthroVet Complex SBC
VITAMIN C (ASCORBIC ACID)	Assistance of the articular cartilage metabolism	A co-enzyme of many enzymes (hydroxylases) playing an important role in collagen synthesis. Ascorbate and ascorbic acid increase protein and proteoglycans synthesis in the chondrocytes of articular cartilages.	<ul style="list-style-type: none"> • ArthroVet • ArthroVet Complex • ArthroVet Complex SBC
AVOCADO AND SOYA EXTRACT	Anti-inflammatory	They have anabolic, anti-catabolic and anti-inflammatory action on chondrocytes, increasing collagen synthesis; they inhibit collagenase, which is stimulated by interleukin 1-beta, increase aggrecan synthesis; inhibit IL1β-dependent extracellular matrix metalloproteinase (MMP)-3, IL-6, IL-8 and prostaglandins E2(PGE2) production.	<ul style="list-style-type: none"> • ArthroVet Complex • ArthroVet Complex SBC
HARPAGOPHYTUM PROCUMBENS	Anti-inflammatory	Anti-inflammatory action is most likely due to the inhibition of the enzyme activity, such as cyclooxygenases and lipoxigenases.	<ul style="list-style-type: none"> • ArthroVet Complex • ArthroVet Complex SBC
L-CARNITINE	Assists fat tissue burning and work of the heart muscle	Assists the transport of fatty acids to mitochondria in cells, thanks to which they can use fatty acids for energy production.	<ul style="list-style-type: none"> • ArthroVet Complex
MANGANESE	Assists the metabolism of articular cartilage	It forms particles of enzymes known as glycosyltransferases, which are necessary for the synthesis of proteoglycans responsible for the formation of healthy bones and cartilages.	<ul style="list-style-type: none"> • ArthroVet Complex • ArthroVet Complex SBC
COLLAGEN TYPE 2	Chondro-protective	A source of amino acids necessary for the synthesis of natural collagen in the matrix of articular cartilages, by guaranteeing a high level of hydroxyproline.	<ul style="list-style-type: none"> • ArthroVet Collagen

*Source: *Suplementy weterynaryjne*, TNS POLSKA 2016 report

WHY THESE INGREDIENTS?

AVOCADO AND SOYA EXTRACT

The use of avocado and soya extract has a very beneficial anti-inflammatory and chondro-protective effect on the knee joint cartilage in dogs with osteoarthritis.

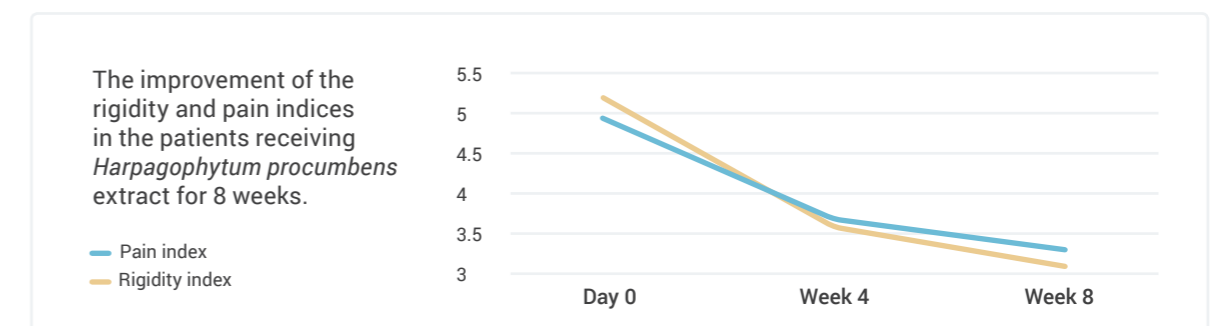


CONCLUSION: The use of avocado and soya extract for 8 weeks resulted in a decrease of the surface of degenerative lesions of the cartilage of the knee joints with osteoarthritis by about 25%.

Source: Christelle Boileau, Johanne Martel-Pelletier, Judith Caron, Philippe Msika, Georges BGuillou, Caroline Baudouinand Jean-Pierre Pelletier (2009) *Protective effects of total fraction of avocado/soybean unsaponified on the structural changes in experimental dog osteoarthritis: inhibition of nitric oxide synthase and matrix metalloproteinase-13*, *Arthritis Research & Therapy* 2009, 11:R41 (doi:10.1186/ar2649)

HARPAGOPHYTUM PROCUMBENS (DEVIL'S CLAW)

The use of devil's claw extract allowed for the reduction of pain, rigidity and improvement of the functioning of the joints in the patients with rheumatoid osteoarthritis.



CONCLUSION: The use of *Harpagophytum procumbens* extract for 8 weeks in the patients with rheumatoid arthritis allowed for the decrease of pain and rigidity index by more than 32%.

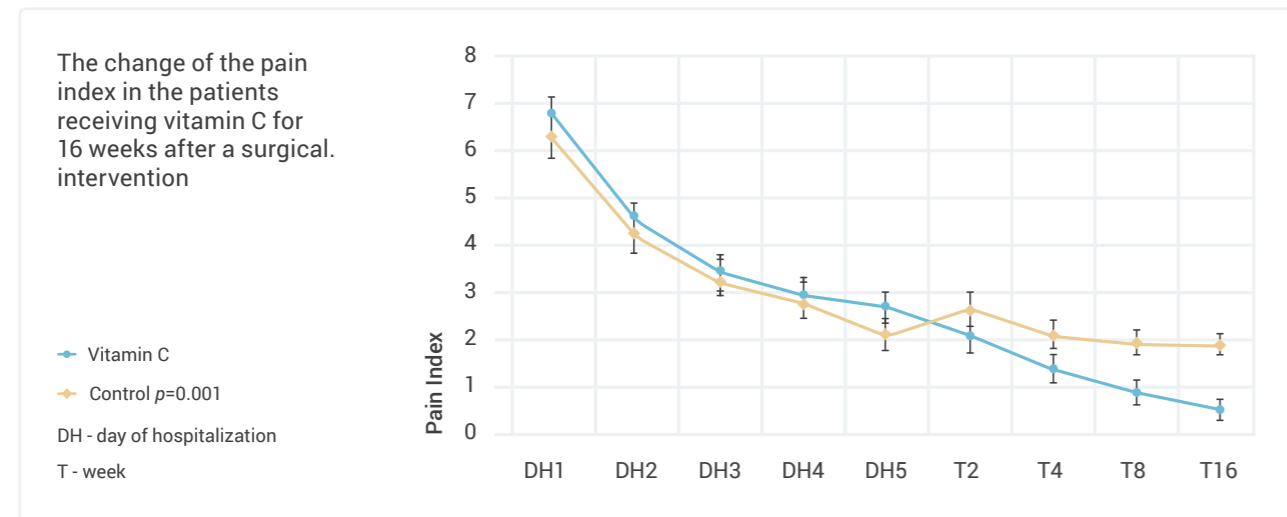
Source: Warnock Mary, McBean Douglas, Suter Andreas, Tan Jen, Whittaker Patricia (2007), *Effectiveness and Safety of Devil's Claw Tablets in Patients with General Rheumatic Disorders Phytoter*, Res. 21, 1228-1233 (2007)

VITAMIN C (L-ASCORBIC ACID)

The results of the most recent research show that vitamin C may have analgesic properties in some clinical conditions, significantly improving the quality of life of the patients. Peptidyl-glycine alpha-amidating monooxygenase (PAM), which is a Vitamin C-dependent enzyme, takes part in the synthesis of endomorphin-1, a natural substance with an analgesic effect (Carr and McCall, 2017).

Source: Anitra C. Carr, Cate McCall, The role of vitamin C in the treatment of pain: new insights. J Transl Med, 2017, 15:77. DOI 10.1186/s12967-017-1179-7

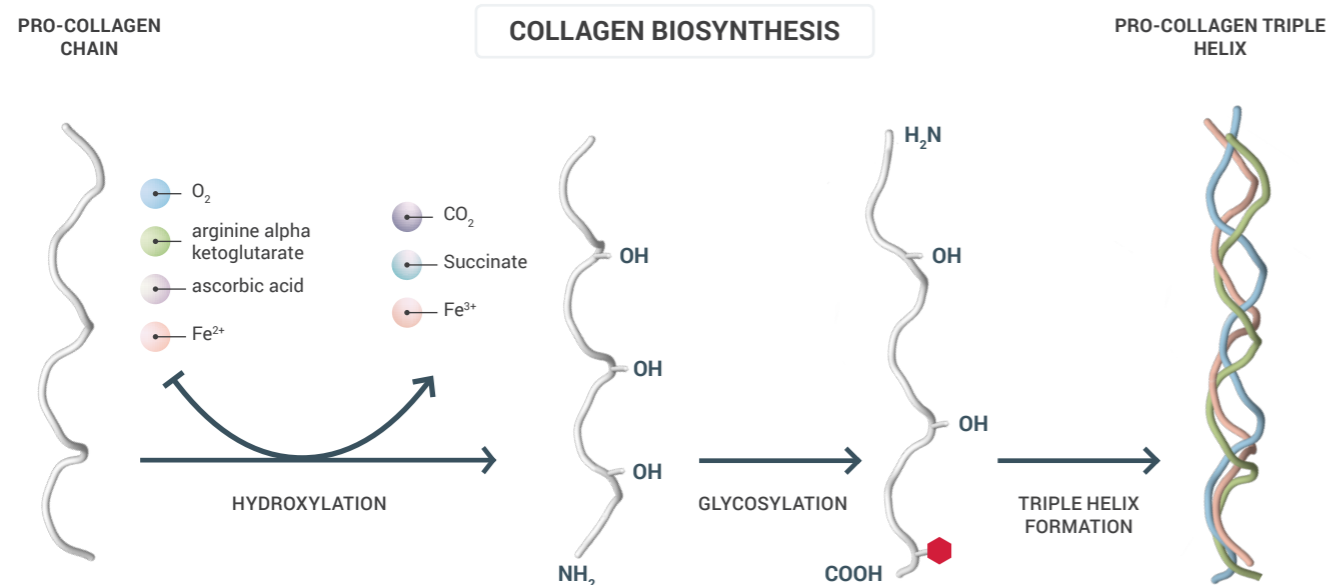
Taking vitamin C may stimulate the production of natural substances with analgesic in an organism.



CONCLUSION: The administration of of vitamin C for 16 weeks post-surgery allows for the **decrease of the pain index.**

Min Sung Kim, Dong Jin Kim, Chan Ho Na, and Bong Seok Shin, A Study of Intravenous Administration of Vitamin C in the Treatment of Acute Herpetic Pain and Postherpetic Neuralgia. Ann Dermatol, 2016 Dec; 28(6): 677-683. Published online 2016 Nov 23. doi: 10.5021/ad.2016.28.6.677

Moreover, vitamin C allows to maintain the correct condition of the connective tissue. It is a co-enzyme of many enzymes and plays a significant role in collagen synthesis.

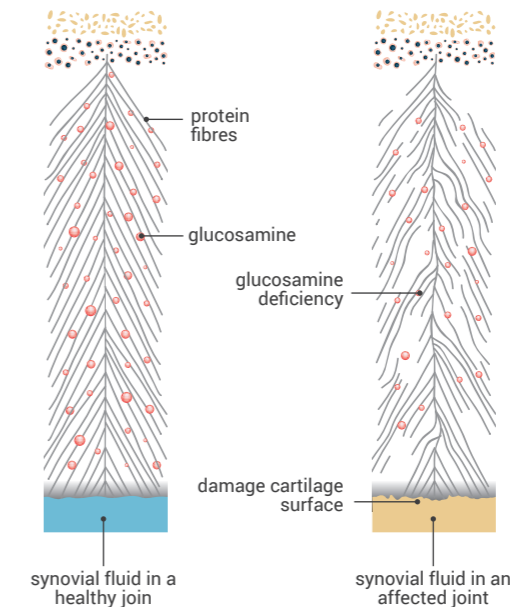


GLUCOSAMINE

Glucosamine takes part in the production of extracellular matrix of articular cartilages which improves elasticity and increases their endurance.

HEALTHY CARTILAGE

Natural cartilage consists of long and multi-branched protein particles produced by the cartilage cells. Between the collagen skeleton there are glucosamine particles, which attract the synovial fluid. In a healthy joint, the synovial fluid comes out of the cartilage. The fluid binds with glucosamine, providing cartilage with elasticity and resilience.

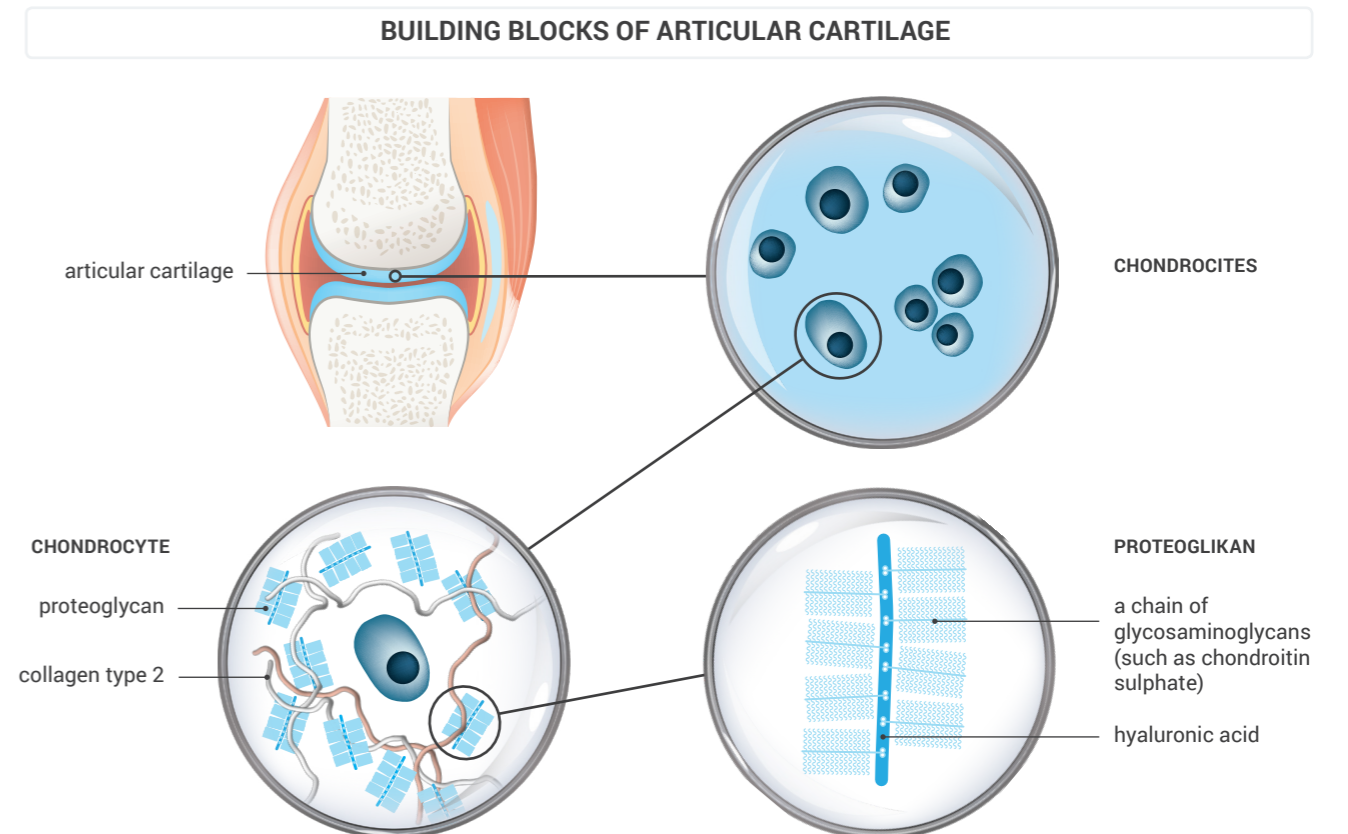


AFFECTED





In osteoarthritis, the function of cartilage cells is affected. Long protein particles begin to degenerate, and the mesh structure containing glucosamine is fragmented. Moreover the glucosamine contents is decreased. The cartilage is less flexible and begins to degenerate.

CHONDROITIN SULPHATE AND HYALURONIC ACID

Extracellular matrix of articular cartilage contains chondroitin sulphate and hyaluronic acid. Their correct amount guarantees proper hydration of the cartilages, improving their ability of bear the body weight.







TREATMENT RECOMMENDATIONS IN OSTEOARTHRITIS

FORM	TREATMENT
MILD OSTEOARTHRITIS	 <p>ArthroVet</p> <p>or</p> <p>ArthroVet Collagen</p> <p>+</p> <p>Weight loss (if necessary)</p>
MODERATE OSTEOARTHRITIS	 <p>ArthroVet Complex / Small Breed</p> <p>+</p> <p>ArthroVet Collagen (if indicated)</p> <p>+</p> <p>Weight loss (if necessary)</p> <p>+</p> <p>Analgesic medications (if necessary)</p>
SEVERE OSTEOARTHRITIS	 <p>Analgesic medication</p> <p>+</p> <p>VetExpert Mobility Dog Diet</p> <p>or</p>  <p>ArthroVet Complex / Small Breed</p> <p>+</p> <p>ArthroVet Collagen (if necessary)</p> <p>+</p> <p>Weight loss (if necessary)</p> <p>+</p> <p>Physical therapy</p>

WHICH IS THE BEST OPTION FOR YOUR PATIENT?

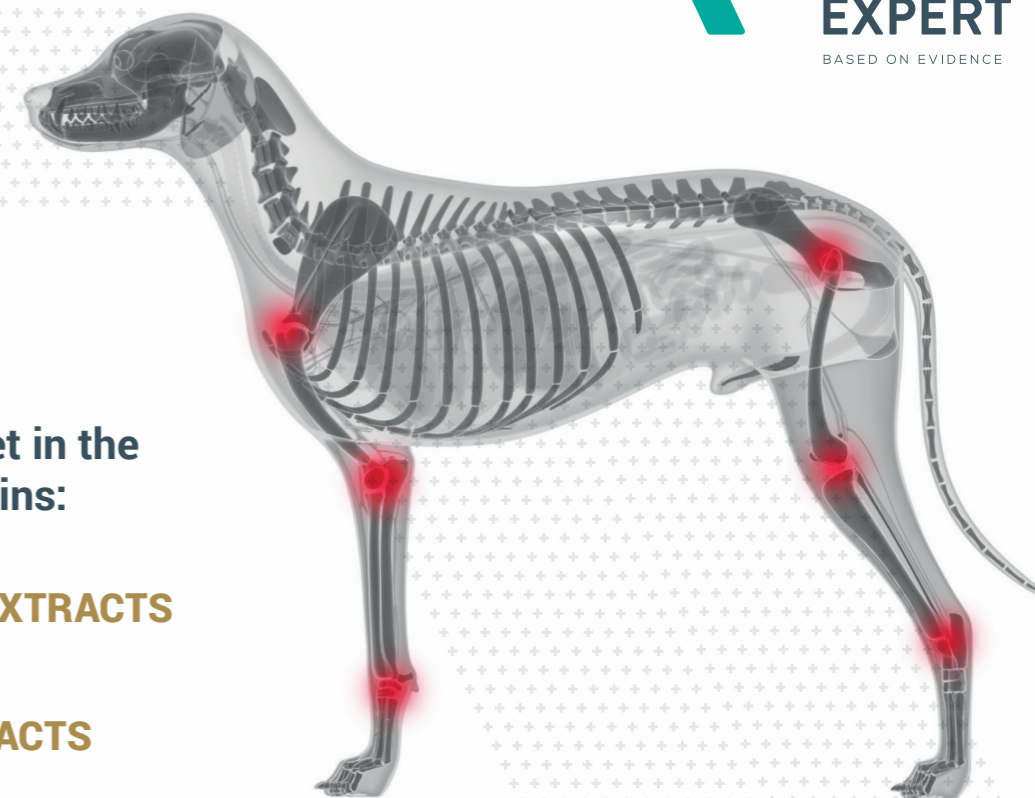


ArthroVet Collagen	ArthroVet	ArthroVet Complex	ArthroVet Complex Small Breed
POTENCY			
+++++	+++++	+++++	+++++
FORMULATION			
			
DOSAGE			
1 sachet / 20 kg b.w.	1 tbl./20 kg b.w.	1 tbl./20 kg b.w.	1 capsule /5kg b.w.
FOR WHOM?			
For prophylactic use in dogs and cats in the periods of intensive growth and in combined therapy in osteoarthritis.	For dogs and cats with articular cartilage function defects.	For large breed dogs with articular cartilage function defects. Dual action: analgesic and anti-inflammatory.	For small-breed dogs and cats with articular cartilage function defects. Dual action: analgesic and anti-inflammatory.
COMPOSITION			
<ul style="list-style-type: none"> • collagen type 2 	<ul style="list-style-type: none"> • glucosamine • chondroitin • hyaluronic acid • vitamin C 	<ul style="list-style-type: none"> • glucosamine • chondroitin • hyaluronic acid • vitamin C • <i>Harpagophytum procumbens</i> • avocado extract • soy extract • manganese • L-carnitine 	<ul style="list-style-type: none"> • glucosamine • chondroitin • hyaluronic acid • vitamin C • <i>Harpagophytum procumbens</i> • avocado extract • soy extract • manganese • L-carnitine



VETEXPERT MOBILITY DOG

THE DIET THAT SUPPORTS A DOG WITH ARTICULAR FUNCTION DEFECTS



The best form of nutritional support for the patients with articular function defects is a special diet which meets the legal requirements concerning the special nutrition of the dogs with osteoarthritis, and with a history of articular traumas and ligament rupture.

VetExpert Mobility Dog is a unique diet as it is **the first diet in the world** containing avocado and soy extracts which have anti-inflammatory properties and the ability to inhibit the enzymes which cause the degradation of articular cartilages.

INGREDIENT	CONTENTS	FUNCTION
• MUKTIUNSATURATED FATTY ACIDS	330 mg	Alleviate inflammation and have analgesic properties.
• GLUCOSAMINE AND CHONDROITIN	1000 mg/kg	Proteoglycans which are the basic structural elements of articular cartilages.
• L-CARNITINE	170 mg/kg	Necessary To accelerate the cellular metabolism of fatty acids; helps to protect animals with impaired articular function against obesity.
• AVOCADO EXTRACT	1000 mg/kg	Anti-inflammatory properties and the ability to inhibit the enzymes which degenerate articular cartilage.
• SOYA EXTRACT		

VETEXPERT MOBILITY DOG

This is the first diet in the world which contains:



AVOCADO EXTRACTS

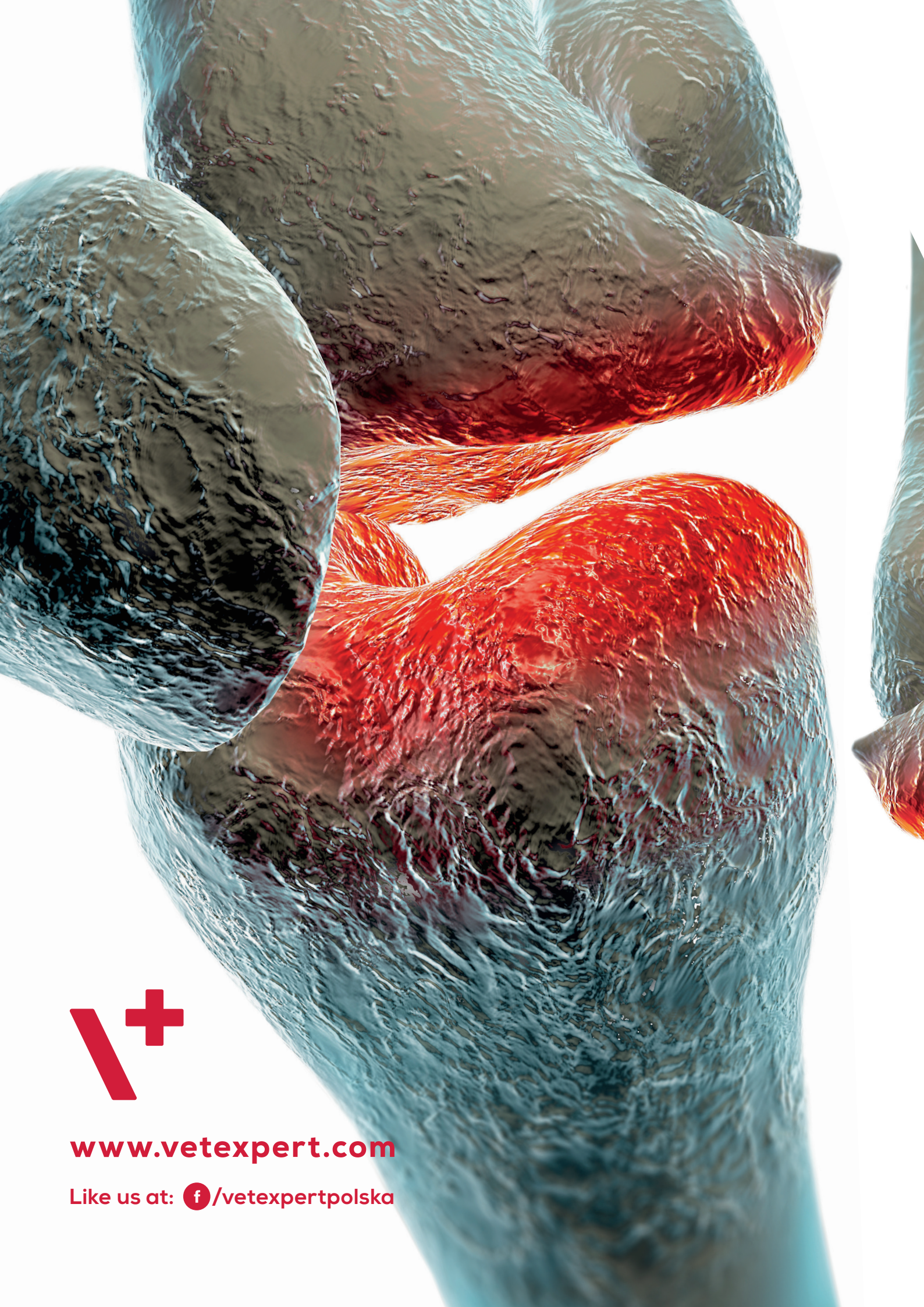


SOYA EXTRACTS



- The only diet with bidirectional anti-inflammatory mechanism of action: omega-3 fatty acids and avocado and soya extracts
- High protein contents guarantees perfect taste of the feed;
- Additionally, the diet supports the function of the alimentary tract, thanks to the contents of FOS, MOS and Yucca Schidigera extract.





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