

Product name	Cortisan
Product type	Complementary feed
Dosage form	Oil complex
Package size(s)	30ml, 100ml, 300ml
Animal species	Cat, dog, horse
Composition & Additives	Microalgae oil (omega-3 (min.117,5mg/ml DHA + EPA, of which min. 23,5mg/ml EPA)), canola oil <u>Sensory additives (per kg):</u> Frankincense extract (60,000mg), curcuma extract (10,000mg)
Analytical components	Crude protein (1.7%), crude ash (0.6%), crude fiber (2.9%), crude fat (93.6%)
Ingredients and science-based studies/papers/literature	
Microalgae oil	<p>Microalgae fatty acids to used for prevention of the appearance of health complications caused by inflammatory states: Effect of Supplementation with <i>n</i>-3 Fatty Acids Extracted from Microalgae on Inflammation Biomarkers from Two Different Strains of Mice L E Gutiérrez-Pliego, B E Martínez-Carrillo, A A Reséndiz-Albor, I M Arciniega-Martínez, J A Escoto-Herrera, C A Rosales-Gómez, R Valdés-Ramos; 2018 https://pubmed.ncbi.nlm.nih.gov/29805810/ (Last accessed date: 04.01.2024)</p> <p>DHA-rich Algal Oil is safe: Safety evaluation of DHA-rich Algal Oil from Schizochytrium sp I Fedorova-Dahms 1, P A Marone, M Bauter, A S Ryan; 2011 https://pubmed.ncbi.nlm.nih.gov/21914458/ (Last accessed date: 04.01.2024)</p> <p>Microalgae Oil can be positive in treatment of rheumatoid arthritis: Docosahexaenoic acid in the treatment of rheumatoid arthritis: A double-blind, placebo-controlled, randomized cross-over study with microalgae vs. sunflower oil C Dawczynski 1, M Dittrich 2, T Neumann 3, K Goetze 3, A Welzel 3, P Oelzner 3, S Völker 4, A M Schaible 4, F Troisi 4, L Thomas 4, S Pace 4, A Koeberle 4, O Werz 4, P Schlattmann 5, S Lorkowski 6, G Jahreis; 2018 https://pubmed.ncbi.nlm.nih.gov/28302406/ (Last accessed date: 04.01.2024)</p> <p>Microalgae are the primary producers of EPA and DHA, which have antioxidant, anti-inflammatory and anti-cancer properties: Microalgae <i>n</i>-3 PUFAs Production and Use in Food and Feed Industries Remize, M.; Brunel, Y.; Silva, J.L.; Berthon, J.-Y.; Filaire, E. (2021) https://www.mdpi.com/1660-3397/19/2/113 (Last accessed: 04.01.2024)</p> <p><i>n</i>-3 PUFAs may help to resolve inflammation and alter the function of vascular biomarkers: Omega-3 Polyunsaturated Fatty Acids (PUFAs): Emerging Plant and Microbial Sources, Oxidative Stability, Bioavailability, and Health Benefits—A Review (2021)</p>

	<p>Saini, R.K.; Prasad, P.; Sreedhar, R.V.; Akhilender Naidu, K.; Shang, X.; Keum, Y.-S. https://www.mdpi.com/2076-3921/10/10/1627 (Last accessed: 04.01.2024)</p> <p>Microalgal oils are particularly appealing due to their sustainability, high purity and quality, “vegetarian” origin, and improved organoleptic qualities when compared to fish oils: Alternative Sources of n-3 Long-Chain Polyunsaturated Fatty Acids in Marine Microalgae Martins, D.A.; Custódio, L.; Barreira, L.; Pereira, H.; Ben-Hamadou, R.; Varela, J.; Abu-Salah, K.M. (2013) https://www.mdpi.com/1660-3397/11/7/2259 (Last accessed: 04.01.2024)</p> <p>EPA and DHA are the precursors of anti-inflammatory mediators and oily fish species obtain their n-3 PUFA, (especially DHA and EPA) by consuming microalgae: Health Benefits, Food Applications, and Sustainability of Microalgae-Derived N-3 PUFA Liu, Y.; Ren, X.; Fan, C.; Wu, W.; Zhang, W.; Wang, Y. (2022) https://www.mdpi.com/2304-8158/11/13/1883 (Last accessed: 04.01.2024)</p> <p>Schizochytrium aggregatum oil is a good source of DHA and of effective, bioaccessible antioxidants: The oxidative stability of microalgae oil (Schizochytrium aggregatum) and its antioxidant activity after simulated gastrointestinal digestion: Relationship with constituents Lv, J., Yang, X., Ma, H., Hu, X., Wei, Y., Zhou, W. and Li, L. (2015) https://onlinelibrary.wiley.com/doi/10.1002/ejlt.201400588 (Last accessed: 04.01.2024)</p>
<p>Frankincense (Boswellia serrata)</p>	<p>Frankincense protecting intestinal epithelial barrier from inflammatory damage: Boswellia serrata Preserves Intestinal Epithelial Barrier from Oxidative and Inflammatory Damage Daniela Catanzaro, Serena Rancan, Genny Orso, Stefano Dall'Acqua, Paola Brun, Maria Cecilia Giron, Maria Carrara, Ignazio Castagliuolo, Eugenio Ragazzi, Laura Caparrotta, Monica Montopoli; 2015 https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0125375 (Last accessed date: 08.11.2023)</p> <p>Boswellia serrata as potent anti-inflammatory, anti-arthritic and analgesic agent: Effectiveness of Boswellia and Boswellia extract for osteoarthritis patients: a systematic review and meta-analysis Ganpeng Yu, Wang Xiang, Tianqing Zhang, Liuting Zeng, Kailin Yang, Jun Li; 2020 https://pubmed.ncbi.nlm.nih.gov/32680575/ (Last accessed date: 08.11.2023)</p> <p>Boswellia serrata containing acids responsible for inhibition of pro-inflammatory enzymes: Boswellia serrata, a potential antiinflammatory agent: an overview M Z Siddiqui; 2011 https://pubmed.ncbi.nlm.nih.gov/22457547/ (Last accessed date: 08.11.2023)</p> <p>Antiinflammatory effects: Potential complementary and/or synergistic effects of curcumin and boswellic acids for management of osteoarthritis</p>

	<p>Vidhu Sethi, Manohar Garg, Maxime Herve, Ali Mobasheri; 2022 https://pubmed.ncbi.nlm.nih.gov/36171802/ (Last accessed date: 08.11.2023)</p> <p>Curcumin and Boswellia serrata showed improvement in lipo-oxidation: Curcumin and Boswellia serrata Modulate the Glyco-Oxidative Status and Lipo-Oxidation in Master Athletes Nino Cristiano Chilelli 1, Eugenio Ragazzi 2, Romina Valentini 3, Chiara Cosma 4, Stefania Ferraresso 5, Annunziata Lapolla 6, Giovanni Sartore; 2016 https://pubmed.ncbi.nlm.nih.gov/27879642/ (Last accessed date: 04.01.2024)</p> <p>Boswellia serrate and Curcumin reduce symptoms in patients with OA: Efficacy and safety of curcumin and its combination with boswellic acid in osteoarthritis: a comparative, randomized, double-blind, placebo-controlled study Armine Haroyan 1 2, Vahan Mukuchyan 3, Nana Mkrtchyan 3, Naira Minasyan 3, Srubhi Gasparyan 3, Aida Sargsyan 3, Mikael Narimanyan 4, Areg Hovhannisyan; 2018 https://pubmed.ncbi.nlm.nih.gov/29316908/ (Last accessed date: 04.01.2024)</p> <p>Boswellia serrate and Curcuma longa can alleviate inflammation in sport horses: Dietary Supplementation with Boswellia serrata, Verbascum thapsus, and Curcuma longa in Show Jumping Horses: Effects on Serum Proteome, Antioxidant Status, and Anti-Inflammatory Gene Expression Daniela Beghelli 1, Lorenzo Zallocco 2, Cristina Angeloni 3, Onelia Bistoni 4, Maurizio Ronci 5, Clarita Cavallucci 6, Maria Rosa Mazzoni 7, Anna Nuccitelli 1, Chiara Catalano 8, Silvana Hrelia 3, Antonio Lucacchini 9, Laura Giusti; 2023 https://pubmed.ncbi.nlm.nih.gov/36983904/ (Last accessed date: 04.01.2024)</p> <p>The FEEDAP Panel concluded that the additive under assessment is safe for horses at the maximum proposed use level of 100 mg/kg in complete feed (dogs - 330 mg/kg) Safety and efficacy of a feed additive consisting of an extract of olibanum from Boswellia serrata Roxb. ex Colebr. for use in dogs and horses (FEFANA asbl) Vasileios Bampidis, Giovanna Azimonti, Maria de Lourdes Bastos, Henrik Christensen, Mojca Fašmon Durjava, Maryline Kouba, Marta López-Alonso, Secundino López Puente, Francesca Marcon, Baltasar Mayo, Alena Pechová, Mariana Petkova, Fernando Ramos, Yolanda Sanz, Roberto Edoardo Villa, Ruud Woutersen, Paul Brantom, Andrew Chesson, Johannes Westendorf, Paola Manini, Fabiola Pizzo, Birgit Dusemund (2022) https://efsa.onlinelibrary.wiley.com/doi/full/10.2903/j.efsa.2022.7158 (Last accessed: 04.01.2024)</p> <p>Literature: Phytotherapie in der Tiermedizin Cäcilia Brendieck-Worm, Matthias F. Melzig 2. Auflage; 2021</p>
<p>Curcuma (Curcuma longa)</p>	<p>Curcuma as a source of natural antioxidants: Antioxidant properties of popular turmeric varieties from Bangladesh Tanvir E. M., Hossen; 2017 https://www.hindawi.com/journals/jfq/2017/8471785/#conclusion (Last accessed date: 08.11.2023)</p> <p>Therapeutic use of Curcuma longa:</p>

	<p>A Comprehensive Review on the Therapeutic Potential of Curcuma longa Linn. in Relation to its Major Active Constituent Curcumin Shivkanya Fuloria, J Mehta, A Chandel, M Sekar, N N I M Rani, M Y Begum, V Subramaniyan, K Chidambaram, L Thangavelu, R Nordin, Y S Wu, K Sathasivam, P T Lum, D U Meenakshi, V Kumarasamy, A K Azad, N K Fuloria; 2022 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8990857/ (Last accessed date: 08.11.2023)</p> <p>In-vitro study on the effect of curcumin: Curcumin inhibits pro-inflammatory mediators and metalloproteinase-3 production by chondrocytes M Mathy-Hartert 1, I Jacquemond-Collet, F Priem, C Sanchez, C Lambert, Y Henrotin; 2009 https://pubmed.ncbi.nlm.nih.gov/19579007/ (Last accessed date: 04.01.2024)</p> <p>Anti-inflammatory effect of curcumin: Impact of curcumin supplementation on expression of inflammatory transcription factors in hemodialysis patients: A pilot randomized, double-blind, controlled study Livia Alvarenga 1, Roberta Salarolli 2, Ludmila F M F Cardozo 3, Rhayssa S Santos 4, Jessyca S de Brito 5, Julie Ann Kemp 3, Drielly Reis 5, Bruna Regis de Paiva 3, Peter Stenvinkel 6, Bengt Lindholm 6, Denis Fouque 7, Denise Mafra; 2020 https://pubmed.ncbi.nlm.nih.gov/32204978/ (Last accessed date: 04.01.2024)</p> <p>Curcumin has been shown to exhibit anti-inflammatory activity through the suppression of numerous cell signalling pathways including NF-κB, STAT3, Nrf2, ROS and COX-2: Curcumin, the golden nutraceutical: multitargeting for multiple chronic diseases Ajaikumar B Kunnumakkara, Devivasha Bordoloi, Ganesan Padmavathi, Javadi Monisha, Nand Kishor Roy, Sahdeo Prasad, Bharat B Aggarwal. (2016) https://bpspubs.onlinelibrary.wiley.com/doi/10.1111/bph.13621 (Last accessed 04.01.2024)</p> <p>Chronic inflammation, oxidative stress, and most chronic diseases are closely linked, and the antioxidant properties of curcumin can play a key role in the prevention and treatment of chronic inflammation diseases: Curcumin Attenuates Lipopolysaccharide-Induced Renal Inflammation He, Y.; Yue, Y.; Zheng, X.; Zhang, K.; Chen, S.; Du, Z. (2015) https://www.mdpi.com/1420-3049/20/5/9183 (Last accessed 04.01.2024)</p> <p>Bioavailable turmeric extract is as effective as paracetamol in reducing pain and other symptoms of knee osteoarthritis and found to be safe and more effective in reducing CRP and TNF-α Bioavailable turmeric extract for knee osteoarthritis: a randomized, non-inferiority trial versus paracetamol Shubha Singhal, Nazer Hasan, Kirti Nirmal, Rohit Chawla, Shalini Chawla, Bhupinder Singh Kalra & Anil Dhal (2021) https://trialsjournal.biomedcentral.com/articles/10.1186/s13063-021-05053-7#citeas S (Last accessed 04.01.2024)</p> <p>Curcumin improved clinical parameters in ovalbumin-induced asthma, both in vivo (mice) and in vitro (BEAS-2B cells) Curcumin Attenuates Asthmatic Airway Inflammation and Mucus Hypersecretion Involving a PPARγ-Dependent NF-κB Signaling Pathway In Vivo and In Vitro</p>
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	<p>Tao Zhu, Zhihong Chen, Guihua Chen, Daoxin Wang, Shuo Tang, Huojin Deng, Jing Wang, Shengjin Li, Jian Lan, Jin Tong, He Li, Xinyu Deng, Wei Zhang, Jiayang Sun, Yuesheng Tu, Wanting Luo, Changyi Li (2019) https://www.hindawi.com/journals/mi/2019/4927430/ (Last accessed 04.01.2024)</p> <p>Antiinflammatory effects: Potential complementary and/or synergistic effects of curcumin and boswellic acids for management of osteoarthritis Vidhu Sethi, Manohar Garg, Maxime Herve, Ali Mobasher; 2022 https://pubmed.ncbi.nlm.nih.gov/36171802/ (Last accessed date: 08.11.2023)</p> <p>Curcumin and Boswellia serrata showed improvement in lipo-oxidation: Curcumin and Boswellia serrata Modulate the Glyco-Oxidative Status and Lipo-Oxidation in Master Athletes Nino Cristiano Chilelli 1, Eugenio Ragazzi 2, Romina Valentini 3, Chiara Cosma 4, Stefania Ferraresso 5, Annunziata Lapolla 6, Giovanni Sartore; 2016 https://pubmed.ncbi.nlm.nih.gov/27879642/ (Last accessed date: 04.01.2024)</p> <p>Boswellia serrate and Curcumin reduce symptoms in patients with OA: Efficacy and safety of curcumin and its combination with boswellic acid in osteoarthritis: a comparative, randomized, double-blind, placebo-controlled study Armine Haroyan 1 2, Vahan Mukuchyan 3, Nana Mkrtchyan 3, Naira Minasyan 3, Srбуhi Gasparyan 3, Aida Sargsyan 3, Mikael Narimanyan 4, Areg Hovhannisyan; 2018 https://pubmed.ncbi.nlm.nih.gov/29316908/ (Last accessed date: 04.01.2024)</p> <p>Boswellia serrate and Curcuma longa can alleviate inflammation in sport horses: Dietary Supplementation with Boswellia serrata, Verbascum thapsus, and Curcuma longa in Show Jumping Horses: Effects on Serum Proteome, Antioxidant Status, and Anti-Inflammatory Gene Expression Daniela Beghelli 1, Lorenzo Zallocco 2, Cristina Angeloni 3, Onelia Bistoni 4, Maurizio Ronci 5, Clarita Cavallucci 6, Maria Rosa Mazzoni 7, Anna Nuccitelli 1, Chiara Catalano 8, Silvana Hrelia 3, Antonio Lucacchini 9, Laura Giusti; 2023 https://pubmed.ncbi.nlm.nih.gov/36983904/ (Last accessed date: 04.01.2024)</p> <p>Literature: Phytotherapie in der Tiermedizin Cäcilia Brendieck-Worm, Matthias F. Melzig 2. Auflage; 2021</p>
<p>Rapsöl (Brassica napus oil)</p>	<p>Growing scientific evidence supports the use of canola oil, beyond its beneficial actions on circulating lipid levels, as a health-promoting component of the diet: Evidence of health benefits of canola oil Lin Lin, Hanja Allemekinders, Angela Dansby, Lisa Campbell, Shaunda Durance-Tod, Alvin Berger, Peter JH Jones (2013) https://academic.oup.com/nutritionreviews/article/71/6/370/1882361?login=false (Last accessed 04.01.2024)</p>

General information about product efficacy and safety

All products are developed in collaboration with veterinarians, pharmacists, chemists, biologists, microbiologists and engineers. In this process, the effect of the individual ingredients as well as the combination in the final product are evaluated. The efficacy assessment as well as the risk analyses and safety assessments are mandatory and are conducted and approved by and with our scientific experts.

Product efficacy and risk analysis

Efficacy assessment/Ensuring effectiveness

To ensure the efficacy of the products, the following measures are taken:

- all raw materials are checked whether they need to be adjusted on necessary ingredients. This is taken into account when selecting the raw materials (general examples: content of apigenin, curcumin, silymarin)
- The dosage of the ingredients are chosen so that at least the lower limit values indicated in the literature and/or studies is reached.
- If applicable, synergistic effects of the contained ingredients are taken into account

Risk analysis

The risk analysis of the product includes the following points:

- Evaluating the compatibility of ingredients and animal species
- Evaluating critical ingredients
- Evaluating possible contraindications
- Evaluating possible side effects
- Evaluating possible risks (such as allergic reactions, overdosing, etc.)

Inuvet Quality Control

Quality control at Inuvet includes manufacturer selection, control of raw materials and control of our products. The Department of Quality Assurance monitors product quality. To guarantee safety for animals, we perform risk analysis for our products.

Manufacturer Selection

Manufacturers are selected according to their authorisation/registration for a respective product type. With suppliers, a quality assurance agreement (QAA) is signed prior to inclusion into the list of approved suppliers. All suppliers are evaluated once a year as part of the supplier evaluation.

Quality control of raw materials

Raw materials for the manufacturing of products are bought by Inuvet and sent to the external manufacturers or bought by those manufacturers according to quality assurance agreements. Raw materials are purchased by feed standard certified companies. Raw material is in food or feed grade.



Once received, all raw materials are checked to meet the specifications according to the delivery notes and COAs before being subsequently released for production. If further testing is necessary, Inuвет commissions these to an external laboratory.

Inuвет marketing creates lettering for packaging and labels. QM checks these in accordance with the applicable laws and mandatory markings.

Quality control of externally manufactured products, raw material and packaging

The external manufacturers set up their quality control in accordance with the quality assurance agreements and provide the resulting certificates of analysis. Inuвет adds their own controls as needed.

In different intervals Inuвет sends their products to an external laboratory to analyze the products. Usually more parameters were analyzed compared to those measured regularly by the German feed monitoring authorities. Testing parameters are for example analytical components, unwanted substances like heavy metals, aflatoxins or pesticides and microbiological tests for salmonella and Enterobacteriaceae.

Version	Date	Name	Role	Signature
Creation of product data sheet				
01	04.01.2024	Samanta Kopp	Member of Product Development & Innovation	
Review and approval of product data sheet				
01	01.03.2024	Yannick Rohloff	Head of Product Development & Innovation	
01	15.03.2024	Melanie Sesiani	Head of Quality Management/Quality Control	