BOSWELLIA

UNLOCKING SUPERIOR BENEFITS FOR JOINT SUPPORT, INFLAMMATORY BALANCE AND GUT HEALTH

2026

EVANIUM

OPTISOLV®

TECHNOLOGY

Large, high-need health segments are driving demand for boswellia in joint and gut health products

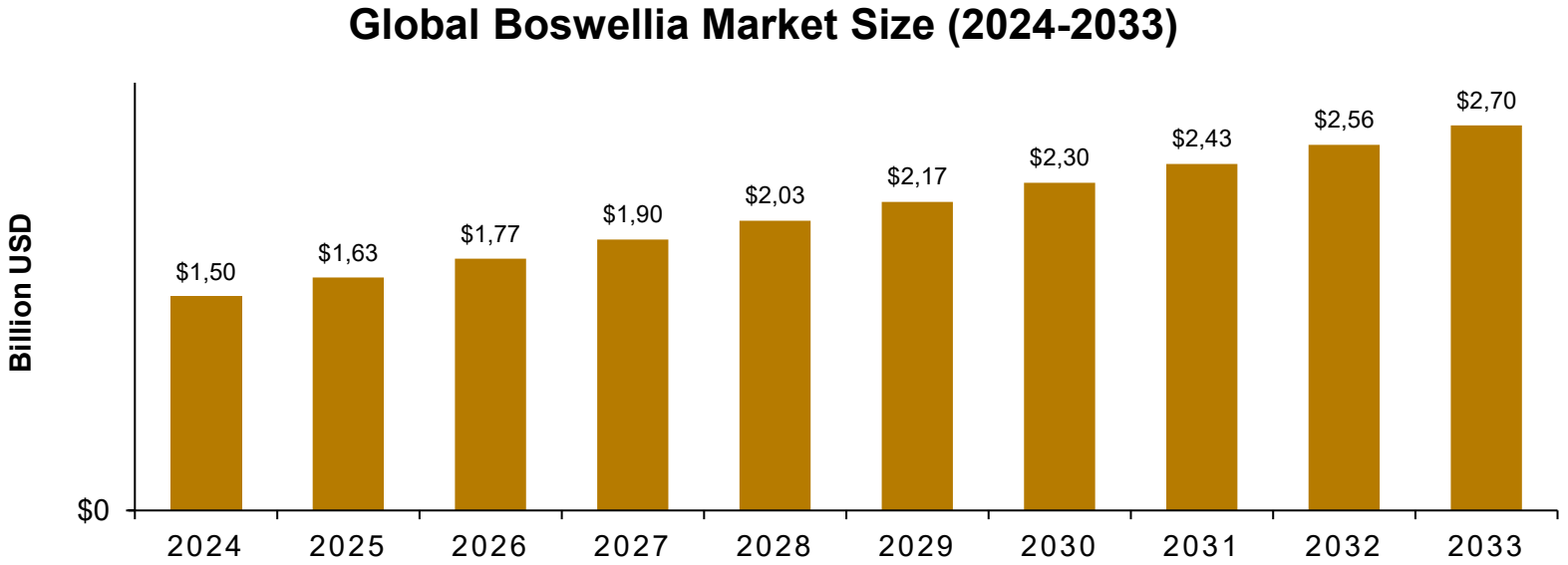
>40 %
of the worldwide population suffers from chronic gastrointestinal problems

14,8%
of people over 30 years of age experienced arthritis or joint pain globally in 2020

$15.01 B
estimated market size for bone and joint health supplements in 2025

$19.98 B
estimated market size for gut health supplements in 2025

Gut health and **joint health** represent some of the **most relevant** application areas, driven by a significant impact on the **quality of life** experienced by affected individuals.



- **Large, high-need markets**: Joint and gut health address massive consumer populations, translating into sizable supplement categories
- **Clear category tailwind**: With the global Boswellia market projected to reach ~$2.7B by 2033, brands can scale within a growing ingredient segment while tapping much larger adjacent health categories.
- **Portfolio-fit & formulation pull**: Boswellia enables multi-benefit positioning across joint and digestive wellness and is increasingly integrated into modern formats (e.g., multi-ingredient systems and convenient daily-use products)

SOURCES: Global Boswellia Market Size, Industry Share & Forecast 2026-2034 | Bone & Joint Health Supplements Market to Climbs USD 34.04 Bn by 2035 | Gut Health Supplements Market Size | Industry Report, 2033 | Rome Foundation Global Epidemiology Study | The Rome Foundation | Global, regional, and national burden of osteoarthritis, 1990–2020 and projections to 2050: a systematic analysis for the Global Burden of Disease Study 2021 - The Lancet Rheumatology

Boswellia Addresses Key Health Needs Through Multi-Pathway Biological Activity Modulating Inflammation, Joint Health, and Gut Function

Boswellia serrata extract applied for 6 weeks **demonstrated a similar remission-inducing effect** on subjects with ulcerative colitis and with chronic colitis compared to standard sulfasalazine medication, as measured by stool properties, histopathology of rectal biopsies, and blood parameters [1-2]

Boswellia extract exhibited a **specific antimicrobial** effect on the gut microbiome and **enriched beneficial species** incl. *Lactobacillus* and *Bifidobacteria* in-vivo [3-4], highlighting the promising function of the compound for human gut health

Boswellia serrata extract led to a significant **diminution in knee joint swelling** and effectively mitigated cartilage destruction in-vivo by preserving **collagen type II (COL2A1)** and reducing serum levels of collagen degrading enzymes **MMP-1, MMP-3 and MMP-13** [5]

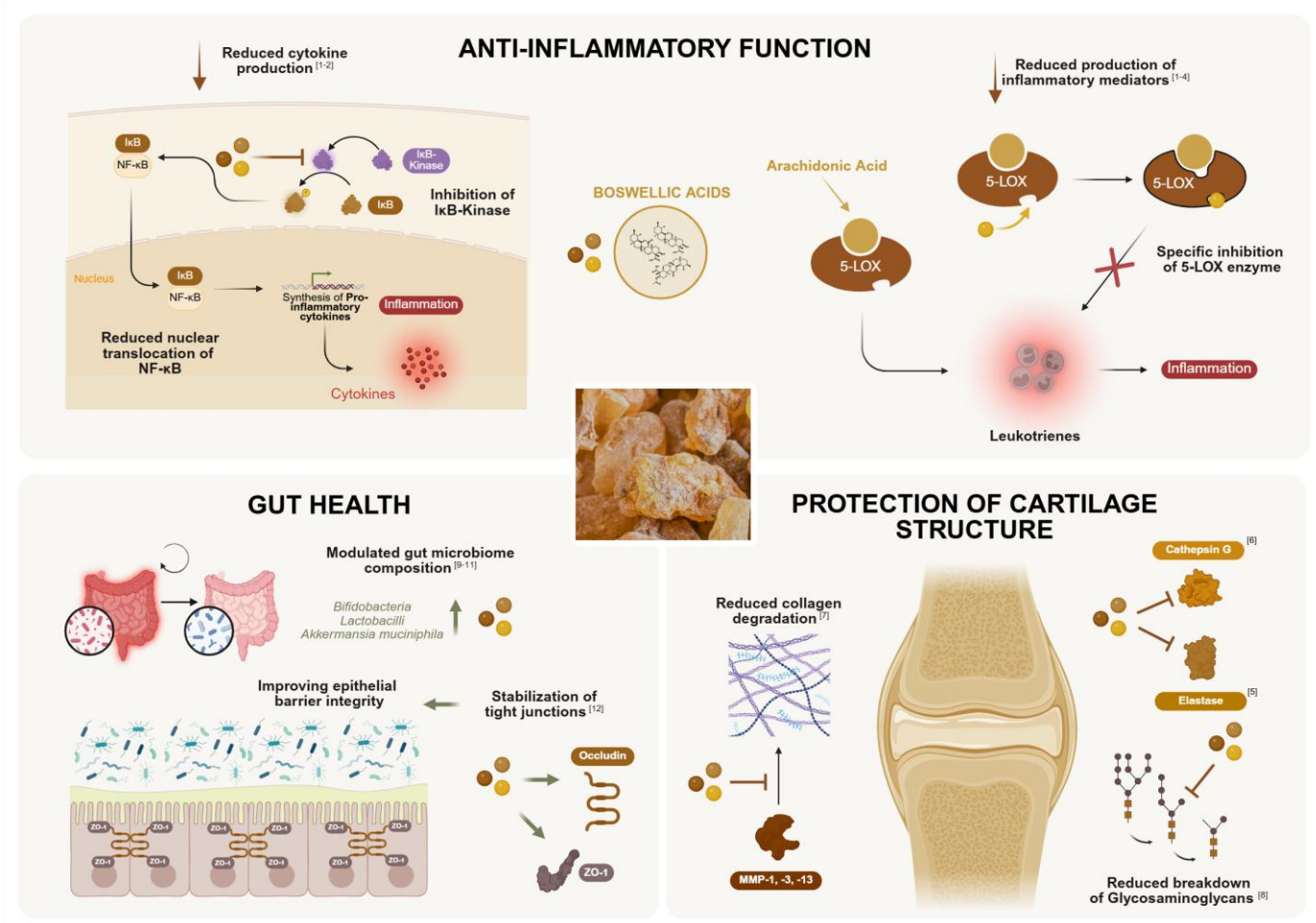
Boswellia serrata extracts and boswellic acids effectively decrease the activity of **human leucocyte elastase (HLE)**, thereby **reducing the degradation of cartilage matrix** (e.g. proteoglycans and collagen) and contributing to the preservation of cartilage integrity [6]

Boswellia serrata extract exhibited an **antioxidative** and **anti-inflammatory** activity in-vivo by reducing inflammatory mediators (incl. IL-1β, IL-6, IFN-γ, and TNF-α) and improving biochemical parameters (incl. SOD, catalase, articular elastase, and NO) [7]

Boswellic acids, particularly AKBA, **modulate leukotriene biosynthesis** via allosteric interaction with **5-lipoxygenase (5-LOX),** reducing leukotriene-driven inflammatory signaling [8]

(1) Gupta, I et al., *European journal of medical research*, 1997.
(2) Gupta, I et al., *Planta medica*, 2001.
(3) Kiczorowska, B et al., *Annals of Animal Science*, 2016.
(4) Suther, C et al., *Nutrients,* 2022.
(5) Choi, Y-J et al., *International journal of molecular sciences,* 2024.
(6) Safayhi, H et al., *The Journal of pharmacology and Experimental Therapeutics*, 1997.
(7) Umar, S et al., *Phytomedicine*, 2014.
(8) Gilbert, N C et al., *Nature Chemical Biology*, 2020.

Mechanistic Insights Into Boswellia's Action on Inflammatory Signaling, Cartilage Protection, and Gut Function

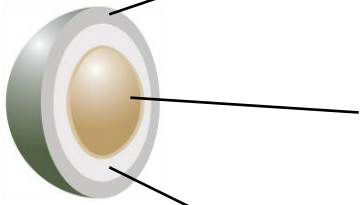


- Boswellic acids **reduce inflammation-inducing reactions** [1-4]
- Boswellic acids **block tissue degradation** [5-6]
- Boswellic acids **protect cartilage structure** by reducing matrix-damaging proteins and preserving stabilizing carbohydrate-structures [7-8]
- Boswellic acids show **antimicrobial function** and may shift the gut microbiome to health-beneficial species [9-11]
- Boswellia ensures **epithelial barrier integrity** by stabilization intercellular tight junctions [12]

SOURCES
(1) Gomaa, A A et al., *Inflammopharmacology,* 2021.
(2) Matho, K et al., *Inflammopharmacology,* 2025.
(3) Gilbert, N C et al., *Nature Chemical Biology*, 2020.
(4) Safayhi, H et al., *The Journal of Pharmacology and Experimental Therapeutics*, 1992.
(5) Safayhi, H et al., *The Journal of pharmacology and Experimental Therapeutics*, 1997.
(6) Kosikowska, P, and Lesner, A. *Expert opinion on therapeutic patents*, 2013.
(7) Choi, Y-J et al., *International journal of molecular sciences,* 2024.
(8) Reddy, G K et al., *Biochemical pharmacology,* 1989.
(9) Raja, A et al., *BMC Microbiology*, 2011.
(10) Kiczorowska, B et al., *Annals of Animal Science*, 2016.
(11) Suther, C et al., *Nutrients,* 2022.
(12) Catanzaro, D et al., *PloS one*, 2015.

By encapsulating actives on a molecular level, our dual-coating technology OPTISOLV® offers wide-ranging benefits, enhancing the efficacy of ingredients

OPTISOLV® dual-coating technology

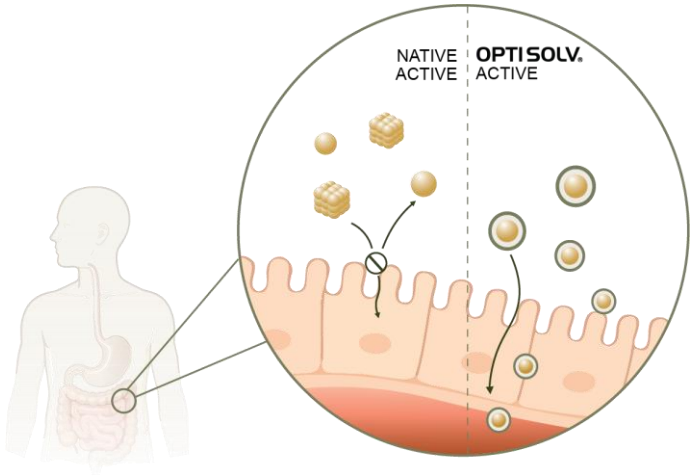


Outer Layer
Phospholipids (ensure stable release overtime, support permeability and taste masking)

Active Core
Poorly soluble ingredient

Inner Layer
Inner cyclodextrin based core (ring shaped starch molecules that improve solubility)

Native vs OPTISOLV® encapsulated ingredients



Native Active
Poor dissolution and low solubility limit absorption in the intestinal tract

OPTISOLV® Active
Crystal-free, dual-coated actives show superior solubility, dissolution, and permeability

OPTISOLV® addresses the key limitations of bioavailability by combining **enhanced solubility** with **improved permeability** through its unique **dual-coating system.**

Crystal-free stabilization enables **superior absorption**, allowing OPTISOLV® to **outperform conventional technologies** while remaining **fully natural**.

OPTISOLV® Boswellia enables increased solubility and controlled release, unlocking the full potential of Boswellia serrata

The perfect ingredient for innovative formulations

Due to **poor bioavailability** and **solubility**, native Boswellia requires high doses (900-1500mg), while OPTISOLV® Boswellia is dosed at only 250–500 mg

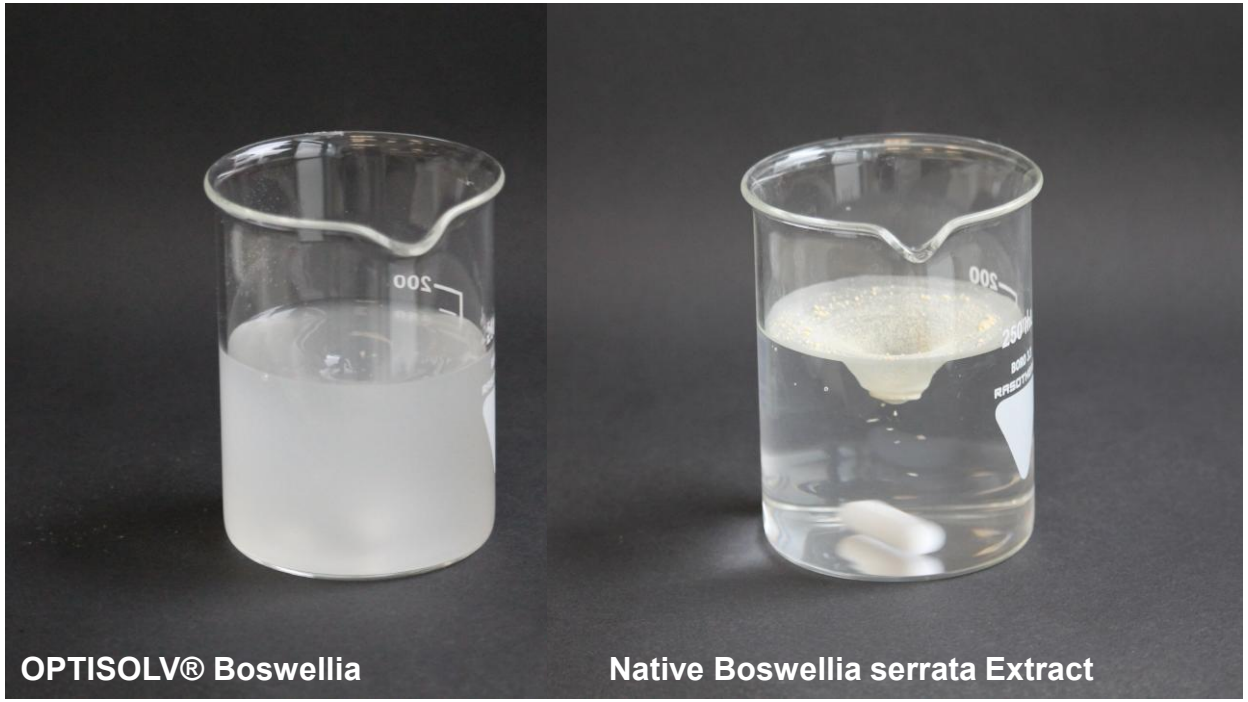
Crystalline structures and **hydrophobicity** of native Boswellia restrict solubility and formulation, whereas OPTISOLV® enables **superior solubility** and diverse dosage forms

Due to **unfavorable release** of native Boswellia, 2-3 doses a day are common, while OPTISOLV® Boswellia shows **stable release,** requiring only 1 dose a day

OPTISOLV® dual-coating enables the next generation of joint & gut health products

The difference our technology makes for Boswellia

- **Increased water solubility** by 110x, enabling stickpack/sachet formulations
- Stable and controlled **dissolution profile**, enabling steady release over time
- **Increased release** by 44x during digestion, enabling lower dose and quick onset of effects

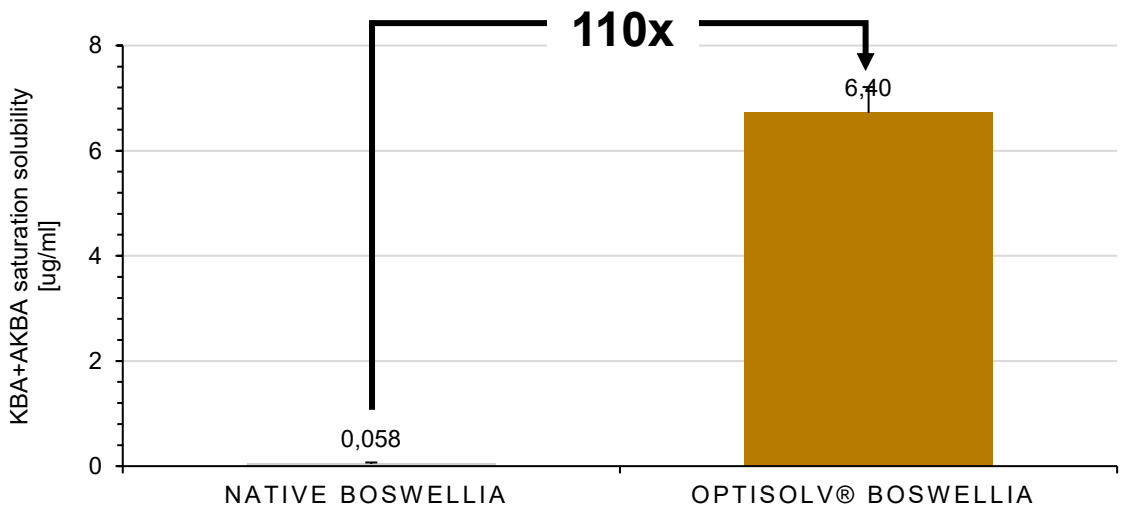


OUR DATA

OPTISOLV® Boswellia offers significantly increases solubility and dissolution in intestinal media, enabling maximum effect for gut & joint health products

Saturation solubility in water

Measurement of the saturation solubility of Boswellia formulations (OPTISOLV® vs. native extract) in distilled water after 2 h via HPLC

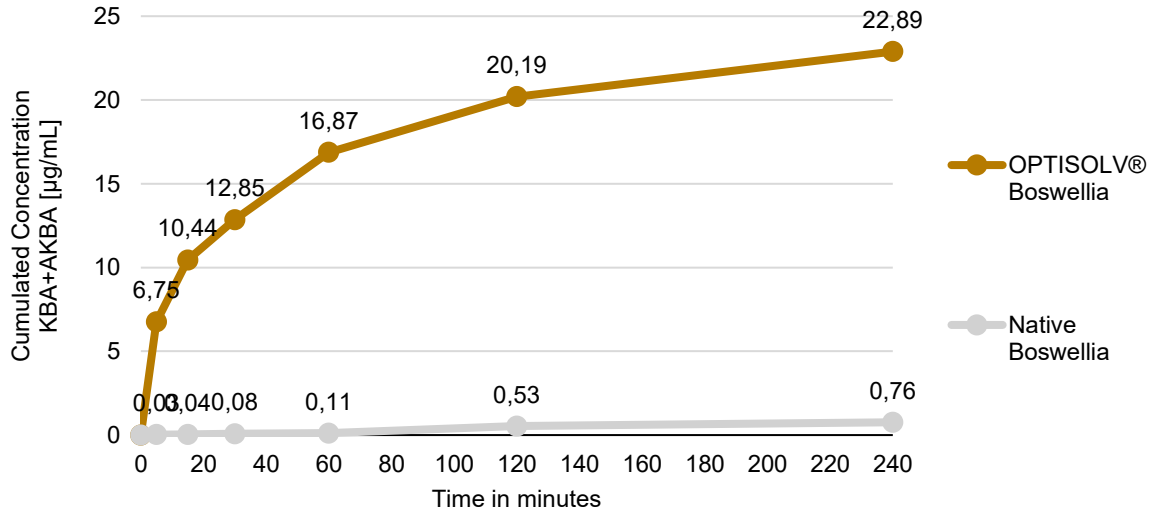


IMPACT

The OPTISOLV® Technology **enhances the water solubility by more than 110x** in comparison to native Boswellia extract

Dissolution in biorelevant intestinal fluid (FASSIF)

- Dissolution profiles of Boswellia formulations (OPTISOLV vs. native) in intestinal media (fasted state simulated intestinal fluid/FASSIF) at 37 °C for 4 h
- Analysis of bioaccessible Boswellic Acids (AKBA + KBA) via HPLC



IMPACT

OPTISOLV® Boswellia dissolves significantly faster with up to **44x improved release** during simulated digestion

OPTISOLV® Boswellia is ideal for nutraceutical and functional food applications, enabling versatile formats and efficient manufacturing

OPTISOLV® Boswellia

- Boswellia complex with 44x higher release during simulated digestion and 110x increased water solubility
- Proprietary formulation with OPTISOLV® technology
- Suitable for different delivery formats
- Standardized to 25-28% total boswellic acids content
- Fully natural, non-GMO
- Process-friendly powder

Suitable For	Nutraceuticals
Source	Boswellia serrata resin
Suitable Dosage Forms	Powders, Capsules, Tablets, Liquids, Stick Packs, Sachets, Gummies, Chewing Tablets
Other Ingredients	Gamma-Cyclodextrin, Boswellia Serrata extract, Lecithin (Sunflower)
Forms	White/Beige Free-Flowing Powder
Shelf Life	36 Month (stored at a cool, dry place protected from sunlight)
Active Content	N.L.T. 25-28% total boswellic acids
Pack Size	10 kg PE in an Aluminum Bag
Health Benefit	Inflammatory Balance| Joint Health | Gut Health
Recommended Dosage	250 – 500 mg Once a Day

OPTISOLV® Boswellia meets the highest quality standards and supports compliance with relevant regulatory requirements

OPTISOLV® Boswellia

- Non-GMO, Vegan, no artificial additives
- Heavy metal, contaminant, content, identity, and microbiology testing for every batch
- No allergens, irradiation, or EO
- Production in Europe follows the highest quality standards in an FDA-registered facility
- FSSC/ISO 22000, HACCP, cGMP compliant
- Halal, Kosher optional
- Full traceability and documentation for every batch

Statement	**Summary** *(Detailed statements and documentation on request)*
Adulteration free statement	Manufactured under strict quality controls and not adulterated with undeclared, substituted, or prohibited substances; supplier qualification and routine checks applied.
Allergen Management Statement	Produced without intentional use of EU-listed allergens; allergen risks assessed and controlled through supplier qualification and appropriate manufacturing procedures.
BSE/TSE Statement	Of non-animal origin and free from materials of ruminant origin; no risk of BSE or TSE according to EU regulations
Certificate of Origin	A Certificate of Origin stating the country of origin of the raw material and/or finished product can be provided upon request.
Composition Statement	A detailed composition statement, including qualitative ingredient information is available upon request.
Contaminant Statement	Free from BAP, dioxin, heavy metals, melamine, PAH, perchlorates, pesticides, PCB, pyrrolizidinalkaloides, residual solvents, mycotoxins
Flow chart	A detailed process flow chart describing the main manufacturing steps, is available upon request.
Food Grade Declaration	Manufactured in compliance with applicable food-grade standards and suitable for use in food and food supplement applications.
Free From Statement	Free from artificial colors, artificial flavors, dairy, flavoring substances, free from palm oil, fructose, gluten, latex, lactose, magnesium stearate, polysorbate, silicon dioxide, soy-free, sugar, titanium dioxide
Irradiation and ETO-Statement	Not treated with ionizing radiation and not processed using ethylene oxide (ETO), based on supplier declarations and quality controls.
Microbiology Statement	Complies with applicable microbiological specifications for food ingredients; routine microbiological testing is performed.
Nanoparticles Statement	Does not intentionally contain engineered nanomaterials as defined under applicable EU regulations.
Non-GMO-Statement	Not derived from genetically modified organisms and compliant with EU GMO regulations; supporting documentation available upon request.
Novel Food Statement	To the best of our knowledge, the product does not fall within the scope of the Novel Foods Regulation, as governed by Regulation (EU) 2015/2283, detailed information available upon request
Vegan Statement	Of plant origin and produced without ingredients, processing aids, or additives of animal origin; suitable for vegan use.

CONTACT

Partner with us to deliver the next generation of joint and gut health products

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Detailed information upon request

Thank You

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