

LONZA GROUP RECEIVES THE 2023 PRODUCT LEADERSHIP AWARD

*Identified as best in class in the North American
undenatured type II collagen for the joint health industry*

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Lonza Group AG excels in many of the criteria in the undenatured type II collagen for the joint health space.

AWARD CRITERIA	
<i>Product Portfolio Attributes</i>	<i>Business Impact</i>
Match to Needs	Financial Performance
Reliability and Quality	Customer Acquisition
Product/Service Value	Operational Efficiency
Positioning	Growth Potential
Design	Human Capital

Match to Needs

The prevalence of joint health conditions continues to rise globally. According to the Centers for Disease Control and Prevention (CDC), osteoarthritis (a type of joint health condition) is the most common type of arthritis affecting more than 32.5 million Americans, with 62% of individuals being women. The aging population, incidences of unexpected injury, abnormal metabolism, genetic makeup, and immune system dysfunction are the major factors contributing to the development of arthritis among individuals globally.

“Lonza’s UC-II® undenatured type II collagen is derived using a patented gentle, non-enzymatic production process, preserving the collagen’s original helical structure and active epitopes responsible for its unique mechanism of action.”

**– Akheela Dhiman
Industry Analyst**

A sedentary lifestyle and lack of physical activity also increase the incidence of such diseases among young and middle-aged populations. Many ingredients, including hyaluronic acid, collagen peptides, glucosamine, chondroitin, botanicals (e.g., ginger, turmeric, Boswellia serrata), and undenatured type II collagen, are sought after for their direct or indirect association with improving joint health conditions. Traditional joint health ingredients, such as glucosamine and chondroitin, are widely used in supplements and other product forms for the joint health of humans and pets, although there is

conflicting evidence on the efficacy of these ingredients. Industry experts have noted that undenatured type II collagen derived from chicken sternum cartilage is a specific molecule exclusively targeted to support joint health. The efficacy of undenatured type II collagen is supported by a comprehensive body of evidence-based research in human and animal clinical trials demonstrating its positive role in

supporting enhanced joint health and improving overall mobility, flexibility, and joint comfort. This is expected to position undenatured type II collagen as an important health ingredient in the joint health space.

UC-II® undenatured type II collagen is a proprietary joint health ingredient based on collagen that is manufactured by Lonza Group AG (Capsules & Health Ingredients). With its strong science, unique mechanism of action, and enhanced efficacy in addressing joint health conditions with just a small, 40 mg daily dose the ingredient is ideally positioned in the expanding joint health ingredients space.

Ensuring Reliability and Quality through Advanced Proprietary Manufacturing Processes and Clinical Evaluations

Founded in 1897, Lonza is a Swiss-based multinational company active in multiple industries, such as pharmaceuticals, biotechnology, and health ingredients. Lonza's health ingredients product portfolio specializes in developing research-backed ingredients for various consumer needs, such as immune support, joint health support, performance nutrition, and weight management.

Lonza's UC-II® undenatured type II collagen is derived from chicken sternum cartilage (sourced in the United States), which the company acquired in 2016 from InterHealth Nutraceuticals Inc. and has grown since, utilizing its strong position in the human nutrition and health ingredients space. UC-II® undenatured type II collagen is manufactured in a US facility that holds a Good Manufacturing Practice (GMP) certification from NSF under 21 CFR Part 117. The Lonza facility in the United States is certified organic by the Oregon Tilth under the US Department of Agriculture (USDA) organic regulations 7 CFR Part 205. The company, therefore, maintains strict quality control when producing the ingredients from conception to development under the required methods and certifications.

According to Frost & Sullivan's analysis, Lonza's patented manufacturing process and unique mechanism of action sets UC-II® undenatured type II collagen apart from other collagen-based joint health solutions in the market. Lonza's UC-II® undenatured type II collagen is manufactured using a gentle, non-enzymatic production process specifically designed to preserve the collagen's original helical structure and active epitopes. It is vital that these biologically active epitopes and the undenatured collagen structure are maintained to trigger a unique mechanism of action called oral tolerance. This mechanism of action enables the ingredient to provide joint health benefits at a very low 40 mg daily dose – making it unique compared with other joint health ingredients, such as hydrolyzed collagen peptides, which act as building blocks for joint health structures and require a much higher dose to provide joint health benefits.

When taken orally, the undenatured type II collagen in UC-II® reaches peyer's patches in the small intestine, triggering an immune response that stimulates the production of special types of immune cells called regulatory T cells. Regulatory T-cells release bioactive molecules known as cytokines that are transported by the body to the site of inflammation, stimulating chondrocytes' activity (the cells responsible for cartilage formation), which then help restore and build joint cartilage.

Lonza's UC-II® undenatured type II collagen is uniquely positioned in the joint health ingredients industry with its superior low-dose functionality and applicability in a variety of consumer formats. Compared to other joint health ingredient solutions in the market, such as glucosamine and chondroitin requiring daily

supplementation of 2,700 mg (which is equal to 2 to 4 large pills a day),¹ a very small 40 mg daily dose of UC-II® undenatured type II collagen is required to deliver most of its benefits. This low-dose functionality also makes UC-II® undenatured type II collagen a versatile, formulation-friendly solution that can be used across a range of in-demand dosage formats, from capsules and gummies to functional foods and beverages and pet health products - making it a perfect solution for all-in-one innovation. Lonza currently offers UC-II® undenatured type II collagen in a versatile, formulation-friendly powder that can be used across a range of dosage formats, including capsules, functional foods and beverages, and pet health products - making it a perfect solution for all-in-one innovation. UC-II® undenatured type II collagen is uniquely positioned in the joint health ingredients industry with its superior low-dose functionality and applicability in wider consumer formats.

Lonza's UC-II® undenatured type II collagen is also supported by a wealth of research demonstrating its efficacy in addressing joint health among both healthy consumers and those with osteoarthritis. For example, research on UC-II® undenatured type II collagen has demonstrated superior benefits in reducing joint discomfort and stiffness compared to glucosamine and chondroitin as early as 60 days. Moreover, as consumers across all ages recognize the importance of healthy joints and focus on improving their overall range of motion and mobility, UC-II® undenatured type II collagen penetration is expected to expand beyond the old age group. In this regard, the effects of oral supplementation of UC-II® undenatured type II collagen knee joint mobility and flexibility were studied in healthy male and female volunteers aged 20 to 55 in a randomized, double-blind, placebo-controlled clinical study by Lonza. The findings suggested that UC-II® undenatured type II collagen improves joint flexibility 15 times better than the placebo.² The study also found that UC-II(R) supplementation helped subjects meet their daily step count and reduced the duration of discomfort after physical activity by 30 minutes. The findings of this study also suggest that oral supplementation of 40mg/day of UC-II® helps joints feel at least 10 years younger³. Currently, no other ingredient in the undenatured type II collagen space has undergone such rigorous clinical trials.

Frost & Sullivan commends Lonza for cementing the position of UC-II® undenatured type II collagen as a robust and unique offering backed by solid clinical studies and catering to evolving customer demand for holistic health and wellness ingredients. This patent-protected ingredient and manufacturing process covered by US Patent 11,793,217 provides Lonza with a competitive advantage in this space. Moreover, compared to other undenatured type II collagen brands, UC-II® is the most studied undenatured type II collagen.

High Growth Potential Driven by Strong Customer Focus

Lonza expects demand for UC-II® undenatured type II collagen in joint health indications to grow in the coming years. Several studies and scientific evidence suggest UC-II® undenatured type II collagen is more efficacious in supporting joint health compared to other competing ingredients. This is expected to allow

¹ 10.1186/s12937-016-0130-8

² Schön et al. (2022). UC-II® undenatured type II collagen for knee joint flexibility: a multicenter, randomized, double-blind, placebo-controlled clinical study. *J Integr Complement Med*. Online ahead of print. doi: 10.1089/jicm.2021.0365

³ Soucie et al. (2010, November 11). Range of motion measurements: reference values and a database for comparison studies. *Haemophilia*, e-pub. Republished by Centers for Disease Control (CDC). Normal Joint Range of Motion Study. Retrieved July 20, 2021, from cdc.gov/ncbddd/jointrom/.

the company to attract more customers in the coming years and retain existing customers. Lonza notes that customers are excited to learn that the benefits of UC-II® undenatured type II collagen are backed by robust clinical evidence, enhancing its product penetration. Strong science, operational excellence, and a dedicated team of experts are the unique selling propositions that differentiate Lonza in the competitive joint health ingredients industry.

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While competitors in the undenatured type II collagen space exist, Lonza outcompetes them due to its vast global presence. Lonza operates across five continents and boasts more than 35 development and manufacturing sites with a robust global distribution network. The company’s R&D team continues to conduct more clinical studies as part of its future growth plans to establish the benefits of its UC-II® undenatured type II collagen ingredients further, solidifying its position as a leader in the undenatured type II collagen market.

In terms of financial performance, the company’s revenue grew by 15% in 2022, with Capsules & Health Ingredients (UC-II® undenatured type II collagen is offered under this division)

divisions’ sales up by 5.1% in 2022 compared to 2021. Frost & Sullivan’s analysis indicates that in the global undenatured type II collagen market, Lonza holds the largest share of 40% to 45% globally, with the majority of the sales coming from North America. Furthermore, Frost & Sullivan finds that the company is well-positioned to capture a larger market share in the foreseeable future. Strong demand from US consumers owing to the higher awareness of the health benefits of undenatured collagen type II supports the market growth of undenatured type II collagen in the region.

To strengthen collaboration with customers to solve their unique delivery challenges, particularly in the nutraceutical space, in 2022, Lonza’s Capsules and Health ingredient division introduced the Lonza™ service package. Through this collaborative approach, Lonza is positioning itself as an industry-leading partner with the ability and expertise to guide customers throughout the product cycle. For example, it frequently conducts webinars and participates in and sponsors industry events to create more traction for UC-II® undenatured type II collagen ingredients.

Human Capital

Lonza boasts a strong in-house research and technical team with several decades of combined industry experience and is focused on meeting specific customer requirements and developing high-quality product offerings. With a community of more than 17,000 highly skilled employees comprising molecular biologists to process chemists and business support functions, Lonza’s team is highly structured to provide excellent technical support, customer services, and other support functions that contribute to its overall success. The company also offers formulation advice and expertise to customers for tailor-made finished products. Lonza’s decades-long partnerships with customers are a testament to the company’s strong technical expertise and its team’s potential to cater to customers’ current and future requirements.

Conclusion

UC-II® undenatured type II collagen is Lonza's proprietary joint health ingredient that can be formulated for various human and pet applications in dietary supplements, and functional food and beverage products. At dosages as low as 40 mg per day, the UC-II® undenatured type II collagen meets consumers' demand for convenient and easy-to-consume products, providing Lonza with a competitive edge. Various clinical studies have established its use in providing joint comfort and supporting increased mobility and flexibility. As demand for research-backed joint health ingredients expands, ingredients offering well-substantiated claims will likely garner higher market penetration.

With its strong overall performance, Lonza earns Frost & Sullivan's 2023 North American Product Leadership Award in undenatured type II collagen for the joint health industry.

What You Need to Know about the Product Leadership Recognition

Frost & Sullivan's Product Leadership Award recognizes the company that offers a product or solution with attributes that deliver the best quality, reliability, and performance in the industry.

Best Practices Award Analysis

For the Product Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Product Portfolio Attributes

Match to Needs: Customer needs directly influence and inspire the product portfolio's design and positioning

Reliability and Quality: Products consistently meet or exceed customer expectations for performance and length of service

Product/Service Value: Products or services offer the best value for the price compared to similar market offerings

Positioning: Products serve a unique, unmet need that competitors cannot easily replicate

Design: Products feature innovative designs, enhancing both visual appeal and ease of use

Business Impact

Financial Performance: Strong overall financial performance is achieved in terms of revenues, revenue growth, operating margin, and other key financial metrics

Customer Acquisition: Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

Operational Efficiency: Company staff performs assigned tasks productively, quickly, and to a high-quality standard

Growth Potential: Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

Human Capital: Commitment to quality and to customers characterize the company culture, which in turn enhances employee morale and retention

