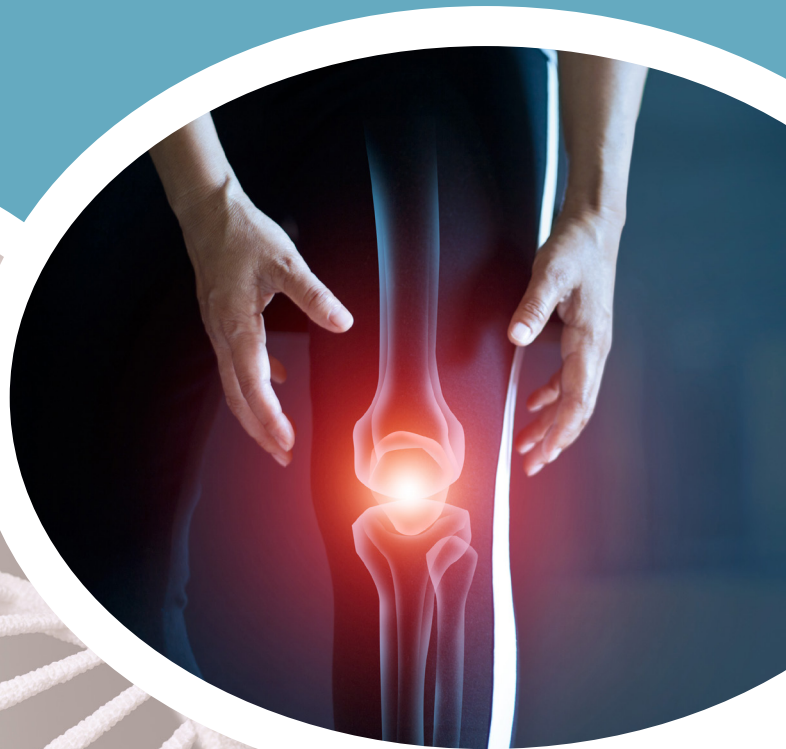


BioCell Collagen® - The market's leading science-driven branded ingredient



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Contents

Market overview	3
Not all collagen is created equal. Choose one that stands out for the right reasons.	4
BioCell Technology LLC (“BioCell”), a science-driven market leader.	5
What is driving the collagen trend?	6
The beauty-from-within boom	6
Healthy ageing	7
Health claims consumers can trust	8
Key takeaways	9

Market overview

Collagen is a booming business. Today more than ever, consumers are seeking clean label, natural ingredients they are familiar with and that offer concrete benefits for health and wellness. Collagen, as a highly functional class of protein that is naturally present in the body, ticks all these boxes and is currently enjoying a surge in popularity.

Just as omega-3 fatty acids are known to benefit numerous areas of health, high-quality bioactive collagen is a multi-functional health ingredient category that offers brands multiple positionings. It promotes healthy ageing thanks to its function on joints, bones and connective tissue; it meets growing sports nutrition requirements thanks to its key role in muscle recovery; and it improves the appearance of skin by increasing elasticity and boosting the skin's own collagen production.

Consumers around the world appreciate this all-round performance, which is reflected in the continuing rise in new product launches featuring collagen.

The functional ingredient has also expanded its reach beyond the supplement category to penetrate finished food and drink as consumers actively seek out packaged products that help them increase their daily collagen requirements in an easy and accessible format.

Innova Market Insights has tracked the demand for collagen in food and drink products globally, including supplements, and noted an impressive 27% increase in average annual growth between 2015 and 2019,¹ while market research experts at Mintel have spoken of the 'ingestible collagen craze'² and described it as the 'hero ingredient' of the moment.³

This translates into a lucrative market opportunity that consumer packaged goods (CPG) brands cannot afford to miss. Worldwide, the collagen market was worth \$8.36 billion last year, and it is set to grow at an impressive compound annual growth rate (CAGR) of 9% from 2020 to 2028.⁴



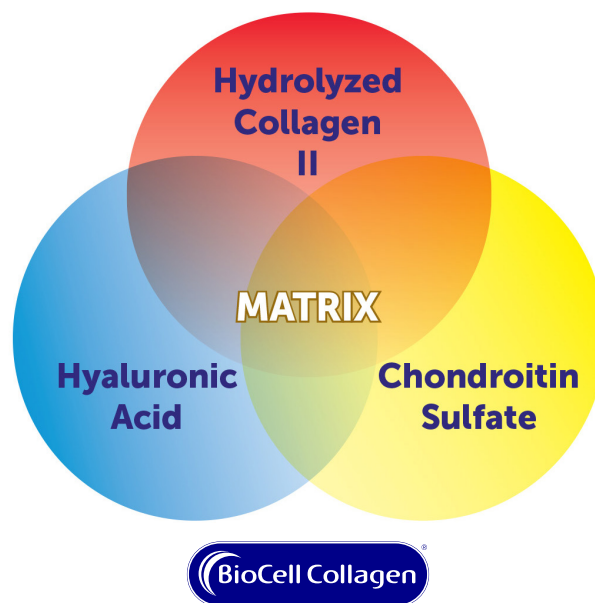
Not all collagen is created equal. Choose one that stands out for the right reasons

Launching a collagen product on the market today is sure to attract consumer attention. However, brands must be aware that not all collagen ingredients are created equal. Collagen type, source, molecular size, composition, manufacturing process and dosage in the final product all impact efficacy.

This means that many suppliers of lower-quality collagen are not able to deliver on the promises they make. Many collagen ingredients on the market today, for instance, are produced from the entire carcass of the animal. Using a low-quality ingredient risks disappointing the final consumer and provoking, at best, a drop in sales; at worst, a backlash of negative reviews.

BioCell Collagen® is much more than isolated or purified collagen protein. BioCell Collagen® is a branded ingredient composed of naturally-occurring hydrolyzed collagen type II peptides, chondroitin sulfate, hyaluronic acid. This unique matrix is not a blend of individual ingredients.

Unique Synergistic Ingredient



BioCell sets itself apart from other players in this competitive space by extracting 100% of its collagen from a single source: pure, free from hormones and antibiotics food-grade chicken sternal cartilage, a rich source of type II collagen, hyaluronic acid, and chondroitin sulfate, which closely mirrors the composition of human articular cartilage.

The synergy of these biomolecules, combined with BioCell's science-based and patent-protected manufacturing process, results in an ingredient with superior bioavailability and a low molecular weight. What this means for BioCell's customers is, they can be sure they are using an ingredient that is more effective at lower doses compared to other collagen products on the market.

Scientific studies have shown that BioCell Collagen® is effective at just 1 g a day for skin benefits and 2 g a day for joint and bone health. Consumers can easily incorporate such doses into their daily routine without the risk of suffering from 'pill fatigue'.

BioCell Technology LLC (“BioCell”), a science-driven market leader

Active in the industry for almost 25 years, BioCell has the knowledge and resources to accompany CPG manufacturers and brands during their product development process from ideation to creation. The ingestible consumer finished products containing BioCell Collagen® currently in development or on the market today range from supplements to gummies to beverages, and are testament to the myriad of product application possibilities.

BioCell Collagen® is shelf stable for three years and remains stable even when blended with other ingredients, making it the ideal collagen choice for brands formulating multi-nutrient supplements or functional food and drink products.

The manufacturing of BioCell Collagen® involves strict procedures that subject the chicken sternal cartilage to various processes, including filtration, purification, concentration, hydrolysis, sterilization, and testing to ensure consistent quality before distribution. BioCell Collagen® is self-affirmed GRAS (Generally Recognized As Safe), non-GMO, and free from gluten, soy, shellfish, fish, egg, milk, peanuts, and sugar. BioCell has unique oversight of its supply chain through its trusted partnerships in the US and Germany.

The California-headquartered company operates a licence model, whereby CPG brands and manufacturers agree to quality provisions and a commitment to exclusively use BioCell supplied ingredients in the finished consumer products, giving it tight control over use and distribution – an increasingly important attribute in today’s complex global supply chains. BioCell earns its revenues from ingredient supply sales.

The result is a trustworthy and recognizable branded ingredient that manufacturers are proud to communicate on-pack. What’s more, recent research conducted by The Ingredient Transparency Center (ITC) found strong levels of recognition and appreciation for branded ingredients specifically among collagen users. Over 60% of the 2,000 consumers surveyed said they always looked for branded ingredients or appreciated branded ingredients when they found them.⁵

The value of the BioCell brand is reflected in its customer sales data: many of BioCell’s customers report that the products containing branded BioCell Collagen® become the ‘star performers’ within their portfolio with some of the highest rates of repeat purchase.

BioCell Collagen® is the clear ingredient choice for clued-in brands looking to differentiate their product in an increasingly busy category.



What is driving the collagen trend?

1. The beauty-from-within boom

As scientific knowledge advances, it is becoming clear that many topical skincare products reach the superficial layers of the epidermis only, meaning their impact on skin appearance may be limited. Consumers today are demanding more from their beauty brands, seeking out science-driven ingredients that work systemically from within the body.

Between 70% and 80% of the dry weight of human skin is composed of collagen,⁶ however the quantity and quality of this collagen degrades with age and sun exposure, resulting in skin that is thinner, less elastic and more fragile⁷. The importance of supplementing the body's own collagen production with a bioavailable external source is therefore clear.

Collagen supplements for skin health are a fast-growing sub-category within the major trend for beauty-from-within products, also known as nutricosmetics. The beauty-from-within movement, worth \$49.5 billion globally in 2018⁸, is being driven by the concept of taking a holistic approach to health, beauty, and physical and emotional well-being.

Today, the belief in holistic health is so widely accepted that it is, according to Mintel, one of the key motivators of consumer behaviour currently and in the future.⁹ The beauty-from-within movement is therefore no short-term fad but a reflection of long-term behavioural changes, and collagen brands are well-placed to tap into this growing billion-dollar market.

Half of US consumers currently use or are interested in using food or drink products with anti-ageing benefits while two in five adults agree their ideal supplement would also support beauty and skin health.¹⁰ This trend is being felt around the world. Nearly one-third of consumers in China have purchased health supplements for beauty.¹¹

A desire to improve skin appearance has also received a somewhat surprising boost from the COVID-19 pandemic. With millions of people around the world now working from home and taking part in daily video calls, only 56% of individuals were happy with their skin health in 2021¹². Researchers recently demonstrated an empirical link between a rise in the use of video calls and a growing interest in beauty treatments, such as waxing, and cosmetic procedures, such as filler injections.¹³

Home-working looks likely to continue beyond the COVID-19 pandemic – only 12% of knowledge workers want to return to the office full-time¹⁴ - while ongoing COVID-19 restrictions around the world continue to force spas and beauty salons to close sporadically. Consumers are looking for easy-to-use, effective cosmetic skincare products for the home and BioCell Collagen[®] fits the bill.



BioCell Collagen[®] is clinically proven to reduce the visible signs of ageing, such as skin dryness, crow's feet lines and wrinkles, and to increase skin elasticity and collagen content in the dermis by 12% after just 12 weeks of supplementation with no reported side effects.¹⁵ ¹⁶ A recently published laboratory study found that daily intake of BioCell Collagen[®] reduced common signs of UVB-induced photoaging and significantly increased skin elasticity and hyaluronic acid content compared to the group that did not receive the supplement.¹⁷

2. Healthy ageing

In 2019, there were 703 million people over the age of 65; by 2050, this is forecast to double to 1.5 billion, with nearly every country in the world experiencing a rise in the number of seniors in their population.¹⁸ This global demographic change is so great the United Nations has said population ageing is set to become one of the most significant social transformations of the twenty-first century.¹⁹

Ensuring quality of life into old age – healthy ageing – will become a priority for millions of individuals, with major areas of concern including preserving joint health and mobility, bone health, and cognitive health.

The opportunities for healthy ageing products are huge not only because of these changing global demographics but also because consumers are increasingly adopting a preventative approach to health at a young age, taking supplements to mitigate the problems associated with old age before the symptoms manifest themselves.

This means that seniors are no longer the only target consumer base for healthy ageing ingredients, such as collagen. Bone health is the second highest health priority for Chinese consumers aged between 26 and 35, according to a 2019 survey conducted by the JD Health Data Center,²⁰ while many US millennials are now entering their 40s and represent a potentially lucrative demographic for healthy ageing brands. Half of US millennials recently surveyed agreed they were more focused on their health now than 10 years ago and just over one-quarter were willing to pay to prevent a health condition, even if it might not occur.²¹

Collagen is known to have targeted beneficial properties for joint comfort and mobility, bone health, connective tissue protection and functional recovery from exercise, which means it can tackle several key areas of concern for healthy ageing at once.

One clinical study demonstrated that a 2 g daily dose of BioCell Collagen® significantly reduced pain levels reported by sufferers of osteoarthritis, helped manage their symptoms and significantly improved their physical activity.²²

A 3 g daily dose of BioCell Collagen® also reduced the serum biomarkers for muscle tissue damage after exercise, suggesting the extract has beneficial effects on connective tissue protection and recovery after physical activity.²³

Market research by Innova reveals that over three-quarters (76%) of consumers aged between 26 and 55 years agree healthy ageing starts with what they eat and drink, while over half (56%) have increased their consumption of functional foods and drinks²⁴. Collagen, with its associations as a natural food ingredient that can be easily added to food and drink products or taken as a supplement, is a winning ingredient for tackling healthy ageing concerns.



Health claims consumers can trust

BioCell Collagen® has demonstrable health benefits, according to robust clinical trials, including studies carried out according to the gold standard of scientific research: randomized, double-blind, placebo-controlled human trials.

What's more, brands that choose to formulate their products with BioCell Collagen® can be confident they are using a highly functional ingredient whose health claims have been substantiated not just by scientists but by top regulatory authorities.

Health Canada, the Canadian government department responsible for helping Canadians maintain and improve their health, has approved several claims for BioCell Collagen® relating to skin and joint health as part of a natural health product licence approval.²⁵

Health Canada recognized that, at a dose of 500 mg twice a day, BioCell Collagen® is effective in helping to reduce the number of deep wrinkles and maintain healthy skin; reduce fine facial lines and wrinkles; increase skin elasticity; increase collagen content in the skin; and promote healthy collagen production in the skin.

Health Canada also approved BioCell Collagen® for helping to relieve joint pain associated with osteoarthritis of the hip and knee at a dose of 1 g twice a day.

In Europe, meanwhile, the European Food Safety Authority (EFSA) has ruled that dietary intake of vitamin C supports normal collagen formation.²⁶ This allows manufacturers who formulate their health supplements with vitamin C and a collagen ingredient such as BioCell Collagen® to make a collagen-related health claim for their product.

Using such approved health claims legitimises the science behind functional ingredients for consumers and gives BioCell Collagen® customers a privileged platform to communicate its important benefits on product packaging and marketing materials.





Key takeaways

- Demand for collagen has soared in recent years as consumers adopt a holistic approach to health.
- Beauty-from-within and healthy ageing are the most promising categories for collagen.
- Not all collagen is equal; collagen's on-trend status has led to a proliferation of sub-standard products on the market.
- Brands must take care to source bioactive, bioavailable collagen that allows them to substantiate their claims, or risk a consumer backlash.
- BioCell Collagen®, made from 100% chicken sternal cartilage, contains a naturally-occurring synergy of hydrolyzed collagen type II peptides, chondroitin sulfate, and hyaluronic acid that has clinically proven benefits for bone and joint health, skin appearance, and muscle recovery.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease

**Interested in using the BIOCELL COLLAGEN® ingredient
in a new product development? Please contact:**

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