

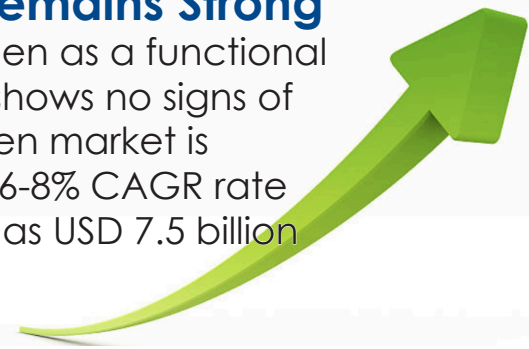
# Collagen for Joint Health

## The Importance of Selecting the Right Types, Form and Molecular Weight



### Collagen Demand Remains Strong

The rapid growth of collagen as a functional ingredient for joint health shows no signs of slowing. The global collagen market is expected to expand at a 6-8% CAGR rate and to generate as much as USD 7.5 billion in sales by 2027.<sup>1,2</sup>



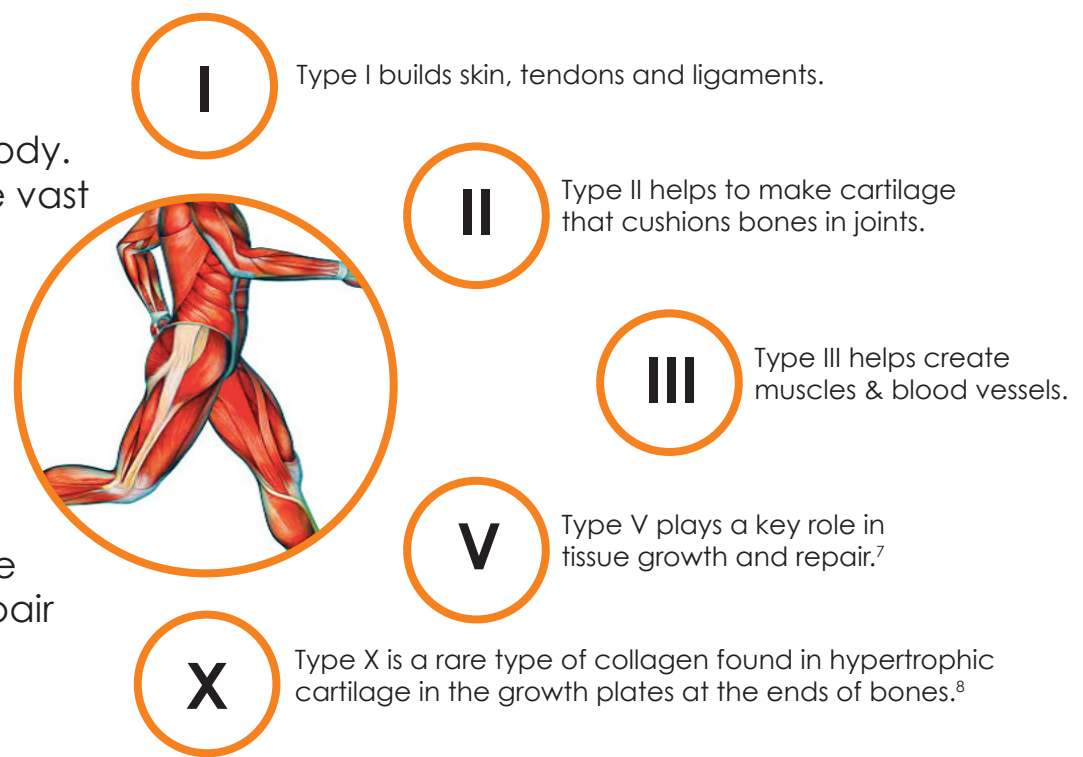
In a 2020 survey by FMCG Gurus, **56%** of consumers said they are interested in foods and beverages that support joint and bone health.<sup>3</sup>

### The Collagen Connection

Collagen is the most abundant protein in the body. There are 28 different types of collagen, but the vast majority of collagen is type I, II or III. Collagen accounts for 60 to 80 percent of the proteins in our connective tissues -- cartilage, tendons and ligaments.<sup>4,5</sup>

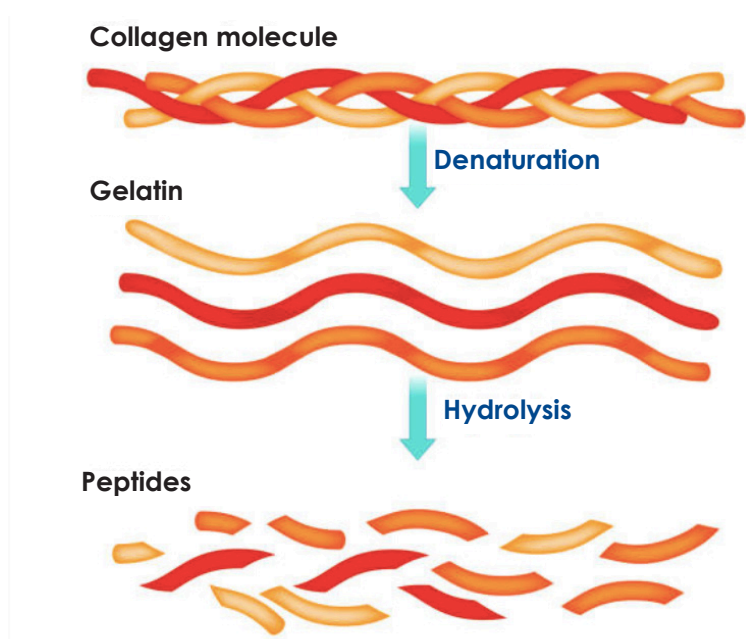
### Importance of Supplementation

As we age, natural collagen production slows and tendons and ligaments may weaken. These connective tissues are in a constant state of repair from exercise and simple wear-and-tear.<sup>6</sup>



### Which Form of Collagen is Best?

Collagen is made of amino acids—literally the building blocks of life—that form triple helix structures and long, thin fibrils that provide strength and flexibility to connective tissues. There are **three** main types of collagen supplement ingredients, each with distinct differences.



- 1) Native (undenatured) collagen.** Its molecular size is too large to be absorbed or taken up into the body. However, it is recognized by the gut immune system and is thought to modulate immune responses to endogenous collagen in the joints.<sup>9</sup>
- 2) Gelatin.** Heat degrades collagen and the unraveling of proteins in gelatin makes them partially bioavailable and gives them a jelling functionality.<sup>10</sup>
- 3) Hydrolyzed (denatured) collagen.** Hydrolyzation breaks down collagen into smaller peptides that are the most bioavailable and bioactive. The peptides bind to receptors on fibroblasts and stimulate the production of new collagen.<sup>11</sup>

### Collagen Sources

Regardless of form, collagen is sourced primarily from poultry, bovine, porcine and marine sources.



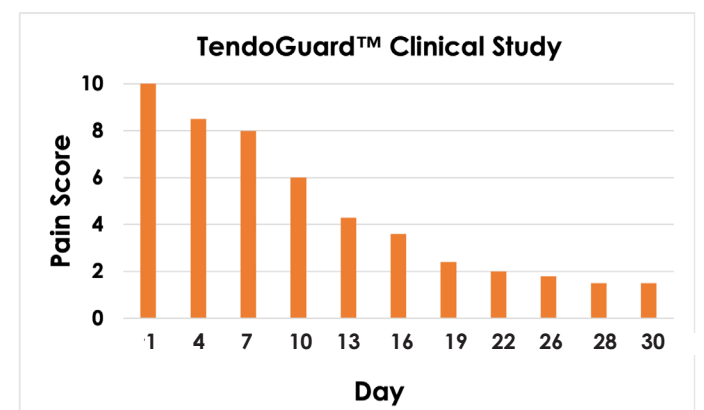
The molecular weight of collagen peptides can greatly affect bioavailability & bioactivity.



### The TendoGuard™ Difference

TendoGuard is a clinically tested blend of avian sternum and eggshell membrane that delivers the **collagen types (I, II, V and X)** essential for maximizing bone, cartilage, and tissue repair.

- Innovative technology optimizes the bioavailability and bioactivity of collagen peptides.
- A molecular weight of 20kD ensures uptake and preserves naturally occurring mucopolysaccharides, hyaluronic acid, chondroitin and glucosamine.



A large body of research supports the benefits of collagen supplementation for joint health. This clinical study demonstrates TendoGuard reduces discomfort and restores freedom of movement.<sup>12</sup>

## TendoGuard™

**Maximum Bioactivity + Optimized Bioavailability**

- Smaller collagen peptides (< 20kD), a product of too much hydrolysis, lose these organic compounds that are essential for maintaining and building strong, healthy joints & connective tissues.
- Proprietary water extraction process; no harsh chemicals.
- Available in powder & liquid concentrate.

**Non-GMO | Non-Irradiated | Non-ETO | TSE/BSE-Free | Allergen-Free | Pesticide-Free**

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.

### Learn More

TendoGuard is a functional ingredient for most foods, beverages and supplements. Visit us at [www.certifiednutra.com](http://www.certifiednutra.com)



1 Collagen Market by Product, Source and Application - Global Forecasts to 2027. ResearchAndMarkets.com, Dec. 2020.  
 2 Collagen Market Size Worth \$7.5 Billion By 2027 | CAGR 5.9%. Grandview Research, Feb 2020.  
 3 Bone and Joint Health in a New Normal World. Nutraceutical Business Review, March 2021.  
 4 Distributions of Types I, II and III Collagen by Region in the Human Supraspinatus Tendon. Connect Tissue Res. 2013; 54(6): 374-379.  
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 6 The Collagen Connection. www.betternutrition.com. Nov. 2019.

7,8,12 Prospective single-center observational study of a new dietary supplement containing collagens type I, II, V, and X. HealthMED. Volume 11, Number 4, 2017.  
 9 Undenatured type II collagen (UC-II®) for joint support: a randomized, double-blind, placebo-controlled study in healthy volunteers. J Int Soc Sports Nutr. 2013; 10: 48.  
 10 Should you Choose Collagen or Gelatin? Healthline.com. Sept. 2020  
 11 Collagen Product Sales Are Skyrocketing, from Supplements to Food. Nutritional Outlook. June, 2018.