

An Overview on Collagen

What is collagen?

Collagen is the most abundant structural protein found in the human body, and it supports our cells, bones and connective tissues.¹ Compared to other proteins, collagen has a unique amino acid composition given its high content of glycine, proline and modified amino acid hydroxyproline.² There are 28 forms of collagen that have been discovered in the human body.¹ Each type provides unique structural support, contributing to functions such as maintaining strong, flexible resistance to force, tension, and stretch within a meshwork of cellular support.¹

Type I, II and III are the most abundant in the body, making up 80-90% of the human body’s collagen.^{3,4,5} These types are the main components of the interstitial matrix,¹ a complex structure of the cells found in the connective tissues that make up and support our bones, ligaments, tendons, nerves, blood vessels, and skin.^{1,6} Other types of collagen play more minor, but vital, roles in the interstitial matrix. Collagen plays a vital role in many functions in the body, including support for skin, hair, nail & joint health.^{*11,12,13,14,15,16,17}

The table below further demonstrates where the different types of collagen support the human body⁵:

Body Location	Collagen Types Present
Cornea	I, V, VI
Heart Valve	I, III, IV
Skeletal Muscle	I, III, VI
Blood Vessels	I, III, IV
Skin	I, III, VI
Adipose Tissue	I, V, VI
Tendons & Ligaments	I, III, V
Bone	I, III, V
Temporomandibular Joint Disc	I, III, V
Auricular Cartilage	I, II, III
Costal Cartilage	II, IX, XI
Facet Joint Cartilage	II, IX, XI
Intervertebral Disc	I, II, III
Articular Cartilage	II, IX, XI
Knee Meniscus	I, II, III

Why is collagen supplementation beneficial?

Our bodies make collagen on their own throughout our lives, but our ability to produce this protein diminishes over the lifespan, starting as early as our 20s. Some studies suggest as much as a 1% decrease per year in collagen replenishment.¹²

This reduction in our natural production of collagen over time can reduce our skin's firmness and elasticity,^{12,13} make our bones, tendons & ligaments weaker^{17,18} and degrades cartilage, such as joint cartilage.¹⁹ These functional declines have implications in our bodies' skin, hair, nail and joint health.

Additional risk factors that accelerate the downturn in our natural collagen production include excessive alcohol use,²⁰ smoking,²¹ overexposure to the sun,²² and a diet high in ultra-processed foods with added sugars.²³

We can obtain collagen through our food intake. Dietary sources of collagen include tough cuts of meat that are full of connective tissue, animal bone broth, gelatin specifically made from boiling bones, cartilage, and skin, and in the bones and skin of fish.²⁴ However, many individuals may not consume these foods regularly, so adding a collagen supplement to our daily regimen may help us continue to reap the benefits of collagen as we age.*

Is collagen a complete protein?

Collagen protein lacks one essential amino acid (tryptophan) and is therefore categorized as an incomplete protein source.

Why is hydrolyzed collagen important?

Dietary collagen is difficult to digest and not easily absorbed. Hydrolyzing collagen involves breaking up the proteins into more easily digested peptides, or chains of beneficial amino acids which is why you often see the terms hydrolyzed collagen and collagen peptides used interchangeably. This method ensures far greater bioavailability.²⁵

What are the potential benefits of collagen peptides?

Adding a collagen peptide supplement to your routine may offer the following benefits:*

- Enhances skin elasticity^{12,13†*}
- Promotes skin firmness^{12,13†*}
- Boosts skin hydration^{12,13†*}
- Strengthens hair & nail health^{14*}
- Supports joint health^{15,16*}

†95% of participants in these studies were female.

Where does the collagen in Orgain's products come from?

Most of the collagen peptides in Orgain's product line are derived from grass-fed, pasture-raised cattle, but we also offer a Marine Collagen option sourced from wild-caught Alaskan Pollock and a Multi Collagen option combining grass-fed bovine collagen, marine collagen, eggshell membrane collagen, chicken bone collagen and chicken bone broth. All the Orgain collagen products include collagen Type I & Type III. Multi collagen also is derived from Types II, V, and X.

Is there a vegan alternative for collagen peptides from animal sources?

At this time, the main sources of collagen are derived from animal and fish sources. Science continues to advance and there is evolving biotechnology to create vegan collagen through fermentation. This process involves genetic engineering to pair amino acids together molecularly identical to animal-derived collagen.²⁸ There is also potential to use algae as abundant vegan marine source of collagen.²⁷

What aids collagen synthesis?

Several nutrients are important for the natural production of collagen in the body. The most significant of these is vitamin C, which is a necessary cofactor in collagen synthesis.²⁹ It also functions as an antioxidant to combat oxidative stress that could otherwise degrade existing collagen.²⁹ Other relevant nutrients include copper and zinc which are additional cofactors in collagen production.^{30,31}

What are the recommendations for use?

Research suggests that a beneficial dose for collagen peptides supplementation may range from 2.5-20 grams per day.^{2,33,34,35} This can typically be achieved with one serving of an [Orgain Collagen](#) product. The benefits of collagen peptides for healthier skin may be apparent in as little as 4 weeks³² with routine supplementation.* Results for hair, nails and joints may take longer. For example, the benefits of collagen peptides for joint health with routine supplementation may be apparent over 3-6 months.^{15,16,26,36*}

What are the attributes of Orgain Collagen Peptide Products?

Orgain's collagen peptide line is subject to the same rigorous raw material approvals, formulation standards meeting Orgain's standards and Good Manufacturing Practices (GMP) as other trusted Orgain products. And as with our collagen products - everything we make is crafted from high-quality ingredients:

- Odorless⁺
- Soluble & easily dissolved
- Easy to mix in hot or cold liquids
- Made with Non-GMO ingredients[^]
- Made without dairy, gluten or soy ingredients
- No artificial flavors, colors or preservatives

⁺not including the [Chocolate Grass Fed Pasture Raised Collagen Peptides](#)

[^]not including [Plant Protein Plus Collagen](#)

Are there any precautions/contraindications?

If you are pregnant, nursing or have a medical condition, please consult with your treating healthcare provider before use.

Still have questions?

Consumers please reach out to us at support@orgain.com and healthcare professionals please reach out to us at medinfo@orain.com and one of our registered dietitians would be happy to address your inquiries.

*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.

Orgain Collagen Products Comparison Chart

(Click on product images to learn more about each product.)

	Collagen Source	Collagen per Serving	Approximate Servings per Container	Collagen Types	Supports Hair Skin Nail & Joints [*]	Made Without Dairy, Gluten or Soy Ingredients	Non-GMO	No Artificial Flavors, Colors or Preservatives	0g of Sugar per serving [*]	Diferentiation	Flavors
 Grass Fed Pasture Raised Collagen Peptides	Bovine	20g	Unflavored 22 Chocolate 17	I & III	✓	✓	✓	✓	✓	Unflavored: Keto & Paleo Diet Friendly Chocolate: Keto Diet Friendly	Unflavored & Chocolate
 Grass-Fed Pasture Raised Collagen Peptides + Superfoods Powder	Bovine	20g	20	I & III	✓	✓	✓	✓	✓	Excellent source of Vitamin C for Immune Support [†] Supports Collagen Production from Excellent Source of Vitamin C [†]	Unflavored
 Collagen + Prebiotics & Probiotics	Bovine	20g	21	I & III	✓	✓	✓	✓	✓	A unique blend of prebiotics and probiotics for comprehensive gut support [†] Paleo Diet Friendly	Unflavored
 Marine Collagen Powder	Alaskan Pollock	12g	20	I & III	✓	✓	✓	✓	✓	More bioavailable compared to bovine collagen [‡] Promotes radiant skin, strengthens hair and nails [†] Paleo Diet Friendly	Unflavored

Collagen products unique to Costco are not included in this chart

^{*}Not a low calorie food. See nutrition information for calorie content. [†]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.

[‡]Not a reduced calorie food. See nutrition information for saturated fat content. [‡]Bioavailability is influenced by molecular weight in comparison between Marine collagen and bovine derived collagen.

Orgain Collagen Products Comparison Chart continued

(Click on product images to learn more about each product.)

	Collagen Source	Collagen per Serving	Approximate Servings per Container	Collagen Types	Supports Hair Skin Nail & Joints [†]	Made Without Dairy, Gluten or Soy Ingredients	Non-GMO	No Artificial Flavors, Colors or Preservatives	0g of Sugar per serving [*]	Differentiation	Flavors
 Multi Collagen	Bovine, Eggshell Membrane, Chicken, Chicken Bone Broth, Chicken Bone, Fish	20g	21	I, II, III, V & X [§] §Derived from	✓	✓	✓	✓	✓	Excellent source of Vitamin C Supports Collagen Production from Excellent Source of Vitamin C[†] Paleo & Keto Diet Friendly	Unflavored
 Plant Protein + Collagen	Bovine	10g	15	I & III	✓	✓		✓	<1g per serving	15g of Plant-Based Protein per serving 1 billion probiotics per serving	Chocolate & Vanilla
 Keto Collagen	Bovine	10g	20	I & III	✓	✓	✓	✓	✓ [^]	5g Medium-Chain Triglyceride oil derived from coconut powder per serving 2:1 Ratio of protein to fat to help you stay on track with your keto-friendly diet Keto & Paleo Diet friendly	Chocolate & Vanilla

Collagen products unique to Costco are not included in this chart

*Not a low calorie food. See nutrition information for calorie content. †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.

^Not a reduced calorie food. See nutrition information for saturated fat content. §Bioavailability is influenced by molecular weight in comparison between Marine collagen and bovine derived collagen.

This document is for informational purposes only and is not intended to be medical advice. The material presented in this document, is not intended to be a substitute for professional medical advice, diagnosis, or treatment. You should seek the recommendation of a medical professional regarding a medical condition or treatment or before starting a new nutrition and/or health regimen.

Orgain products have not undergone research testing for effectiveness with the potential benefits discussed in this overview. You should read carefully all product packaging. If you have or suspect that you have a medical problem, promptly contact your health care provider.

Orgain, LLC is providing this document on an “as is” basis and makes no representations or warranties of any kind with respect to this document. Orgain, LLC nor any of its directors, employees or other representatives will be liable for damages arising out of or in connection with the use of this document. This is a comprehensive limitation of liability that applies to all damages of any kind, including (without limitation) compensatory, direct, indirect or consequential damages, loss of data, income or profit, loss of or damage to property and claims of third parties.

References

- ¹ Nezwak TA, Varacallo M. Physiology, Connective Tissue. Nih.gov. Published October 30, 2019. <https://www.ncbi.nlm.nih.gov/books/NBK542226/>
- ² Paul C, Leser S, Oesser S. Significant Amounts of Functional Collagen Peptides Can Be Incorporated in the Diet While Maintaining Indispensable Amino Acid Balance. *Nutrients*. 2019;11(5):1079. Published 2019 May 15. doi:10.3390/nu11051079
- ³ Naomi R, Ridzuan PM, Bahari H. Current Insights into Collagen Type I. *Polymers*. 2021;13(16). doi:10.3390/polym13162642
- ⁴ Kuivaniemi H, Tromp G. Type III collagen (COL3A1): Gene and protein structure, tissue distribution, and associated diseases. *Gene*. 2019;707:151-171. doi:10.1016/j.gene.2019.05.003
- ⁵ Bielajew BJ, Hu JC, Athanasiou KA. Collagen: quantification, biomechanics, and role of minor subtypes in cartilage. *Nat Rev Mater*. 2020 Oct;5(10):730-747. doi: 10.1038/s41578-020-0213-1. Epub 2020 Jul 20. PMID: 33996147; PMCID: PMC8114887.
- ⁶ Kannus P. Structure of the tendon connective tissue. *Scand J Med Sci Sports*. 2000;10(6):312-320. doi:10.1034/j.1600-0838.2000.010006312
- ⁷ Trentham DE, Dynesius-Trentham RA, Orav EJ, Combitchi D, Lorenzo C, Sewell KL, Hafler DA, Weiner HL. Effects of oral administration of type II collagen on rheumatoid arthritis. *Science*. 1993 Sep 24;261(5129):1727-30. doi: 10.1126/science.8378772. PMID: 8378772.
- ⁸ Ricard-Blum, Sylvie. “The Collagen Family.” Cold Spring Harbor Perspectives in Biology, Cold Spring Harbor Lab, 15 Oct. 2010, cshperspectives.cshlp.org/content/3/1/a004978.full.pdf+html.
- ⁹ Karsdal, N.S. Gudmann M.A. “Type X Collagen.” *Biochemistry of Collagens, Laminins and Elastin*, Academic Press, 12 Aug. 2016, www.sciencedirect.com/science/article/abs/pii/B9780128098479000106.
- ¹⁰ Zhao C, Xiao Y, Ling S, Pei Y, Ren J. Structure of Collagen. *Methods Mol Biol*. 2021;2347:17-25. doi:10.1007/978-1-0716-1574-4_2
- ¹¹ Wu M, Crane JS. Biochemistry, Collagen Synthesis. Nih.gov. Published April 21, 2019. <https://www.ncbi.nlm.nih.gov/books/NBK507709/>
- ¹² Reilly, David M., Kynaston, Liane, Naseem, Salma, Proudman, Eva, Laceby, Darcy, A Clinical Trial Shows Improvement in Skin Collagen, Hydration, Elasticity, Wrinkles, Scalp, and Hair Condition following 12-Week Oral Intake of a Supplement Containing Hydrolysed Collagen, *Dermatology Research and Practice*, 2024, 8752787, 12 pages, 2024. <https://doi.org/10.1155/2024/8752787>
- ¹³ de Miranda RB, Weimer P, Rossi RC. Effects of hydrolyzed collagen supplementation on skin aging: a systematic review and meta-analysis. *Int J Dermatol*. 2021;60(12):1449-1461. doi:10.1111/ijd.15518
- ¹⁴ Hexsel D, Zague V, Schunck M, Siega C, Camozzato FO, Oesser S. Oral supplementation with specific bioactive collagen peptides improves nail growth and reduces symptoms of brittle nails. *J Cosmet Dermatol*. 2017;16(4):520-526. doi:10.1111/jocd.12393
- ¹⁵ Bello AE, Oesser S. Collagen hydrolysate for the treatment of osteoarthritis and other joint disorders: a review of the literature. *Curr Med Res Opin*. 2006;22(11):2221-2232. doi:10.1185/030079906X148373
- ¹⁶ Clark KL, Sebastianelli W, Flechsenhar KR, et al. 24-Week study on the use of collagen hydrolysate as a dietary supplement in athletes with activity-related joint pain. *Curr Med Res Opin*. 2008;24(5):1485-1496. doi:10.1185/030079908x291967
- ¹⁷ Viguet-Carrin S, Garnero P, Delmas PD. The role of collagen in bone strength. *Osteoporosis Int*. 2006;17(3):319-336. doi:10.1007/s00198-005-2035-9
- ¹⁸ Zdzienlik D, Oesser S, König D. Specific Bioactive Collagen Peptides in Osteopenia and Osteoporosis: Long-Term Observation in Postmenopausal Women. *J Bone Metab*. 2021;28(3):207-213. doi:10.11005/jbm.2021.28.3.207
- ¹⁹ Lotz M, Loeser RF. Effects of aging on articular cartilage homeostasis. *Bone*. 2012 Aug;51(2):241-8. doi: 10.1016/j.bone.2012.03.023. Epub 2012 Mar 28. PMID: 22487298; PMCID: PMC3372644.

References continued

- ²⁰ Donejko M, Przyłipiak A, Rysiak E, Mityk W, Galicka E, Przyłipiak J, Zaręba I, Surazynski A. Hyaluronic acid abrogates ethanol-dependent inhibition of collagen biosynthesis in cultured human fibroblasts. *Drug Des Devel Ther*. 2015 Nov 24;9:6225-33. doi: 10.2147/DDDT.S91968. PMID: 26648698; PMCID: PMC4664499.
- ²¹ Knuutinen A, Kokkonen N, Risteli J, Vähäkangas K, Kallioinen M, Salo T, Sorsa T, Oikarinen A. Smoking affects collagen synthesis and extracellular matrix turnover in human skin. *Br J Dermatol*. 2002 Apr;146(4):588-94. doi: 10.1046/j.1365-2133.2002.04694.x. PMID: 11966688.
- ²² Budden T, Gaudy-Marqueste C, Porter A, et al. Ultraviolet light-induced collagen degradation inhibits melanoma invasion. *Nat Commun*. 2021;12(1):2742. Published 2021 May 12. doi:10.1038/s41467-021-22953-z
- ²³ Nguyen HP, Katta R. Sugar Sag: Glycation and the Role of Diet in Aging Skin. *Skin Therapy Lett*. 2015;20(6):1-5
- ²⁴ "Collagen." The Nutrition Source, May 2021, nutritionsource.hsph.harvard.edu/collagen/.
- ²⁵ 101510Sibilla S, Godfrey M, Brewer S, Budh-Raja A, Genovese L. An overview of the beneficial effects of hydrolysed collagen as a nutraceutical on skin properties: Scientific background and clinical studies. *Open Nutraceut J*. 2015;8:29-42.
- ²⁶ Kirmse M, Oertzen-Hagemann V, de Marées M, Bloch W, Platen P. Prolonged Collagen Peptide Supplementation and Resistance Exercise Training Affects Body Composition in Recreationally Active Men. *Nutrients*. 2019 May 23;11(5):1154. doi: 10.3390/nu11051154. PMID: 31126103; PMCID: PMC6566878.
- ²⁷ Rahman MA. Collagen of Extracellular Matrix from Marine Invertebrates and Its Medical Applications. *Mar Drugs*. 2019 Feb 14;17(2):118. doi: 10.3390/md17020118. PMID: 30769916; PMCID: PMC6410095.
- ²⁸ Hancocks, 18-Mar-2024By Nikki, et al. "How Is Animal-Free Collagen Made and Does It Work?" FoodNavigator.Com, www.foodnavigator.com/Article/2024/03/20/How-is-animal-free-collagen-made-and-does-it-work/. Accessed 19 May 2025.
- ²⁹ DePhillipo NN, Aman ZS, Kennedy MI, Begley JP, Moatshe G, LaPrade RF. Efficacy of Vitamin C Supplementation on Collagen Synthesis and Oxidative Stress After Musculoskeletal Injuries: A Systematic Review. *Orthop J Sports Med*. 2018 Oct 25;6(10):2325967118804544. doi: 10.1177/2325967118804544. PMID: 30386805; PMCID: PMC6204628.
- ³⁰ Seo HJ, Cho YE, Kim T, Shin HI, Kwun IS. Zinc may increase bone formation through stimulating cell proliferation, alkaline phosphatase activity and collagen synthesis in osteoblastic MC3T3-E1 cells. *Nutr Res Pract*. 2010 Oct;4(5):356-61. doi: 10.4162/nrp.2010.4.5.356. Epub 2010 Oct 26. PMID: 21103080; PMCID: PMC2981717.
- ³¹ Santa Cruz, Jamie. "Dietary Collagen - Should Consumers Believe the Hype?" Today's Dietitian Magazine, Mar. 2019, www.todaysdietitian.com/newarchives/0319p26.shtml
- ³² E. Proksch, D. Segger, J. Degwert, M. Schunck, V. Zague, S. Oesser; Oral Supplementation of Specific Collagen Peptides Has Beneficial Effects on Human Skin Physiology: A Double-Blind, Placebo-Controlled Study. *Skin Pharmacol Physiol* 1 August 2013; 27 (1): 47-55. <https://doi.org/10.1159/000351376>
- ³³ Choi FD, Sung CT, Juhasz ML, Mesinkovsk NA. Oral Collagen Supplementation: A Systematic Review of Dermatological Applications. *J Drugs Dermatol*. 2019;18(1):9-16.2019;26(3):506-516. doi:10.2174/0929867325666171205170339
- ³⁴ Kviatkovsky SA, Hickner RC, Cabre HE, Small SD, Ormsbee MJ. Collagen peptides supplementation improves function, pain, and physical and mental outcomes in active adults. *J Int Soc Sports Nutr*. 2023 Dec;20(1):2243252. doi: 10.1080/15502783.2023.2243252. PMID: 37551682; PMCID: PMC10411303.
- ³⁵ Clifford, T., Ventress, M., Allerton, D.M. et al. The effects of collagen peptides on muscle damage, inflammation and bone turnover following exercise: a randomized, controlled trial. *Amino Acids* 51, 691-704 (2019). <https://doi.org/10.1007/s00726-019-02706-5>
- ³⁶ Khatri M, Naughton RJ, Clifford T, Harper LD, Corr L. The effects of collagen peptide supplementation on body composition, collagen synthesis, and recovery from joint injury and exercise: a systematic review. *Amino Acids*. 2021 Oct;53(10):1493-1506. doi: 10.1007/s00726-021-03072-x. Epub 2021 Sep 7. PMID: 34491424; PMCID: PMC8521576.

Last updated 1/21/26