Collagen

Collagen is a hard, insoluble, fibrous protein found in muscles, bones, tendons, skin, nails, blood vessels, and the digestive tract. It is abundant in three key amino acids: glycine, proline, and hydroxyproline.

Health benefits of collagen

Collagen is the primary structural protein in the body, essentially acting like the "glue" that holds us together. Collagen supplementation has been associated with various benefits, including:

- Improving joint pain (e.g., exercise recovery, rheumatoid arthritis)
- Maintaining structural health (e.g., joints, bones, ligaments, tendons, hair, skin, nails)
- Protecting against metabolic conditions (e.g., hypertension, type 2 diabetes)
- Providing elasticity and strength to skin
- Repairing and replacing skin cells

Types of collagen

Over 20 types of collagen have been identified. The majority of collagen in our bodies comes from three types: Type 1, Type 2, and Type 3.

Type of collagen	Function	Sources
Type 1	Promotes hair, skin, nail, and bone health	Animal skin, hide, tendons, scales Bones of cows, pigs, chicken, fish
Type 2	Improves joint and cartilage health	Cartilage, often derived from poultry
Type 3	Promotes hair, skin, nail, and bone health	Bone, tendon, cartilage, and connective tissue of cows, pigs, chicken, fish

While dietary collagen can only be obtained from animal sources, there are plenty of foods in plant-based diets that help boost collagen formation in the body.

Boosting collagen naturally

The following table includes dietary components that promote collagen formation in the body.

Dietary component	Sources
Anthocyanins	Blueberries Pomegranate
Copper	Beef liver Cashews Dark chocolate Oysters Potatoes (with flesh) Shiitake mushrooms
Glycine	Dairy products Fish Legumes Meat
Hydroxyproline	Animal proteins (e.g., meat, poultry, salmon) Soy
Proline	Animal proteins (e.g., meat, poultry, salmon) Certain grains (e.g., barley, corn, sorghum, wheat) Milk Soy
Vitamin C	Bell peppers Broccoli Brussels sprouts Citrus fruits (e.g., oranges, grapefruit) Kiwi Strawberries

How to make homemade bone broth

Homemade bone broth contains many beneficial nutrients, including several amino acids (e.g., glycine, proline, lysine). It's also a great way to consume more collagen as well as the nutrients your body needs to make collagen. Research suggests that homemade bone broth is higher in amino acids than commercially made versions. While it may sound daunting, making your own bone broth is actually fairly simple.

In a large stock pot, simmer your bones of choice (e.g., chicken, beef, turkey, fish) covered, over low heat for 48 hours. This will extract the most collagen and nutrients from the bones. You can also do this in a slow cooker if you don't want to use a stovetop.

Once the broth has finished cooking, transfer it to glass jars or containers, let cool, and refrigerate or freeze. As the broth cools, you will notice a layer of gelatin forming. This is a good sign as the gelatin layer is the main source of collagen in bone broth, so be sure to keep it!

Helpful tips:

- Although not necessary, roasting your bones before simmering can improve the flavor of the broth.
- Since toxins are stored in fat and bone broth contains a lot of it, quality is key when purchasing bones. Look for bones from organic, sustainable, grass-fed, pasture-raised, and/or free-range sources.
- Add various vegetables, herbs, and spices to your broth for more flavor and nutrients. This is a great way to use up vegetable scraps like onion peels and carrot tops that you might normally throw away. Some other examples of additions include celery, garlic, ginger root, rosemary, and bay leaves, but feel free to experiment.
- Add 1 to 2 tbsp of apple cider vinegar to your pot to give it a slightly acidic taste and assist with breaking down the bones.

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