

# Q and A: Collagen and biotin supplements

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DEAR MAYO CLINIC: I've read that collagen and biotin are good for the body. What are these supplements, and are they beneficial?

ANSWER: Collagen and biotin supplements appear to be getting attention in the media for promoting healthy aging, along with joint and [bone health](#). However, it is important to understand what [collagen](#) and biotin are and what research is available to support these claims.

Collagen is concentrated in bones, ligaments, tendons, skin, blood vessels and internal organs. It helps provide elasticity and strength. As you age, you begin to lose the collagen within your body, and it becomes harder for you to make more.

At least 30% of your body's protein content is made from collagen. Collagen is made from four [amino acids](#), which are the building blocks for protein: proline, glycine, lysine and hydroxyproline. These amino acids are grouped together in a form known as a triple helix, and that is what makes up collagen. For this triple helix to be formed, you need to have enough vitamin C, zinc, copper and manganese in your diet.

Within the [human body](#), 29 types of collagen have been identified, with three types making up the vast majority.

These are the types you'll usually find in a collagen supplement:

## **Type I**

This type is found in bones, ligaments, tendons and skin for elasticity and strength. The supplement source comes from bovine and fish.

## **Type II**

This type is cartilage. The supplement source comes from chicken cartilage and joint.

## Type III

This type is found alongside type I in skin, blood vessels and internal organs. The supplement source comes from bovine.

If you are planning to take a collagen supplement, either in liquid or powder form, it is important to mention that the triple helix that makes up collagen is unable to be absorbed in its whole form. It will first be broken down into individual amino acids within the gastrointestinal tract before reaching the bloodstream. The body will then reassemble and form new proteins where it sees necessary and for a use it feels is needed.

These new proteins may not contain the same amino acids that were initially ingested in the collagen supplement, and it is unknown if these restructured proteins will target the area a supplement manufacturer is advertising. Therefore, it is undetermined at this time if the body will use a collagen supplement that is purported to help skin, hair, nail and joint support to actually make collagen that would do so. In addition, limited large and long-term randomized control trials support the use and recommendation for collagen supplements for the [general public](#).

From a general health perspective, it is important to ensure adequate protein within your diet. As you age, your protein needs increase slightly to maintain lean body mass. Consuming foods that contain the primary amino acids that make up collagen may help support skin, hair, nail and joint health as you age.

These foods are good sources of glycine, proline, lysine and hydroxyproline:

- Bone broth
- Unflavored gelatin

- Dairy, especially parmesan cheese
- Legumes
- Non-genetically modified soy, such as tofu
- Spirulina
- Animal sources, such as red meat, poultry, pork, fish and eggs

To support the formation of collagen, it is also important to ensure adequate intake of foods that contain vitamin C, zinc, copper and manganese. These nutrients can be found by eating a varied diet rich in fruits and vegetables, including green leafy and root vegetables, along with nuts and seeds—especially hemp, pumpkin and cashews.

Finally, being mindful of what can damage collagen production is important. Such factors include excess sugar intake, smoking, sun exposure or ultraviolet light, and environmental pollutants.

Biotin is a form of the vitamin B7 that helps enzymes break down fats, carbohydrates and protein. While it has been marketed for healthier hair, skin and nails, there is no evidence that taking additional biotin will achieve these claims.

Taking biotin in supplement form may only benefit those with an underlying medical condition that interferes with biotin or those with alcoholism who can be deficient. For the general population, adequate biotin intake of 30 micrograms per day can be achieved from diet alone without the need for supplementation. Biotin can be found in salmon, avocado, sweet potato, pork, and nuts and seeds.

High doses of biotin—10-300 milligrams per day—can provide false high or low blood levels of thyroid-stimulating hormone, vitamin D and troponin. Therefore, it is important to let your [health care provider](#) know if you are taking a biotin supplement—or any [supplement](#).

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