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Buyer Beware: Most Collagen Supplements Sourced From CAFOs

Analysis by Dr. Joseph Mercola | January 22, 2024

STORY AT-A-GLANCE

- Dull, wrinkled, sagging skin and dry, brittle hair and nails are common signs of aging, which in large part can be attributed to the loss of collagen that occurs naturally with age
- Your body cannot produce the essential amino acids that make up collagen, so you must obtain them through your diet. Collagen supplements have become a popular way to combat age-related loss of collagen
- Testing reveals popular collagen and bone broth products contain a number of potentially hazardous contaminants, including antibiotics, prescription drug metabolites, parabens, steroids and insecticides
- These contaminants suggest the collagen is sourced from animals raised in CAFOs. To avoid exposure to CAFO-related contaminants, make sure the product is USDA "100% Organic" and/or certified grass fed by the AGA
- Gelatin is what you get when you cook collagen. Hydrolyzed collagen requires more intensive processing. While both contain the same amino acids, they have different chemical properties and therefore differ in how you can use them

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Dull, wrinkled, sagging skin and dry, brittle hair and nails — all of these are signs of aging, which in large part can be attributed to the loss of collagen that occurs naturally with age. Collagen is the most common and abundant of your body's proteins,

comprising about 25% of the total protein in your body, and up to 80% of your skin, in terms of dry weight.[1]

It's found specifically in the connective tissues throughout your body, from your muscles, bones and tendons to your blood vessels and digestive system. As a compound of essential amino acids, there's only one way to get collagen; your body can't produce it, so you must obtain it through your diet. Most people, however, will simply reach for a collagen supplement rather than boiling down chicken feet or beef bones for a homemade collagen-rich broth.

But what are you really getting in these supplements? Laboratory testing stirred up controversy with popular collagen and bone broth products results revealing potential contaminants — including antibiotics, prescription drug metabolites, parabens, steroids and insecticides.

Troublesome Contaminants Found in Many Nonorganic Collagen Products

The collagen products in question were selected based on their popularity and sales ranking on Amazon.com, and all were nonorganic. The results indicate that if you are consuming bone broth or collagen products that are not organic you are likely getting CAFO (concentrated animal feeding operations) byproducts. As reported by the Consumer Wellness Center (CWC):[2]

> *"The nonprofit Consumer Wellness Center has completed testing of eight popular bone broth and bone broth protein products to determine the possible presence of chemical pesticides, pharmaceuticals, industrial chemicals, toxicological chemicals and food additive chemicals. No companies paid the CWC to be included or excluded from these tests. All products were purchased from Amazon.com in the year 2017.*
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> *Lot numbers of each product tested are included in the full results. No one involved in this testing has any financial stake in the success or failure of any*

bone broth product … Chemical analytes were confirmed using five different scientific analysis methods. Those methods, encompassed in LC-MS-TOF analysis, include accurate mass, retention time, isotopic ratios, isotopic spacing and ion fragmentation 'fingerprint' analysis."[3]

Other chemicals claimed to be found in some of these products include:[4]

- Butylparaben, an endocrine-disrupting chemical associated with reduced testosterone levels[5] and abnormal shape, size and motility of sperm[6]
- Cyclandelate, a vasodilator drug
- Netilmicin, an antibiotic

Nonorganic Collagen and Bone Broth Products Are Likely CAFO-Derived

So, what do these results mean? In a nutshell, if a collagen or bone broth protein product is not certified organic, it is very likely the primary ingredients are sourced from **animals raised in CAFOs**. If you do not consume factory farmed/CAFO meats, you likely should not be consuming CAFO collagen and bone broth products.

Factory farmed animal products are problematic for many reasons, such as accelerating antibiotic resistance, poor conditions for the animals, and because the farms contribute to severe environmental pollution. As the news spread of these findings, CWC updated its press release with the following disclaimer:

"After reviewing consumer feedback about the lab tests, Consumer Wellness Center has learned that many people are misinterpreting these results, and some are taking them out of context … [T]he chemicals originally detected were not ingredients nor overwhelming signals that would indicate any sort of acute health risk or illegality …

[A]t no point did the CWC assert that the products tested were acutely dangerous or running afoul of FDA regulations. The FDA allows astonishing

levels of many chemicals in non-organic products, and this is frequently reflected and affirmed in scientific lab testing results."

CAFO-derived collagen and bone meal or broth may not be acutely toxic, but purchasing food products from factory farms is a problematic practice. I recommend eating mostly organic foods, as each and every source will add to your overall toxic load. Other studies have shown CAFO animal bones and hides can also be a source of heavy metals such as lead,[7] which is another potential concern when buying nonorganic animal products.

Types of Collagen

While 28 different types of collagen have been scientifically identified, most supplements will contain one or more of just three of these, which are known simply as:[8,9,10]

- **Type I —** Collagen found in skin/hide, tendon, scales and bones of cows, pigs, chicken and fish
- **Type II —** Formed in cartilage and typically derived from poultry
- **Type III —** Fibrous protein found in bone, tendon, cartilage and connective tissues of cows, pigs, chicken and fish

Types I, II and III comprise 90% of the collagen in your body.[11] When talking about collagen, you also need to know the difference between unhydrolyzed (undenatured) or hydrolyzed (denatured) collagen. In their natural, hydrolyzed state, collagen molecules are poorly absorbed due to their large size.

Hydrolyzation refers to a processing technique that breaks the molecules down into smaller fragments, thereby enhancing intestinal absorption. For this reason, most collagen products, whether topical or ingestible, are hydrolyzed.

Collagen Versus Gelatin

Gelatin is a staple in Paleo-based diets. The difference between collagen and gelatin is that collagen is the raw material, and gelatin is what you get when you cook the collagen.[12] If you've ever made homemade bone broth, you'll find it forms a layer of gelatin at the top when it cools. That's the collagen from the bones and cartilage that has turned into gelatin, a formidable superfood.

In fact, making your own bone broth from the bones of organic grass fed or pastured animals is one of the best (and most inexpensive) ways to get healthy collagen into your diet. Hydrolyzed collagen (also called collagen hydrolysate) requires more intensive processing and cannot be produced at home. Hydrolyzed collagen and gelatin are similar but not identical.

While both products contain the same amino acids, they have different chemical properties and therefore differ in how you can use them. Both gelatin and hydrolyzed collagen have gut-healing properties, aiding digestion and reducing inflammation, although hydrolyzed collagen tends to be more easily digested.

Since hydrolyzed collagen has been broken down into smaller components, it can dissolve in both cold and hot liquids whereas gelatin will only dissolve in hot liquid. And, since hydrolyzed collagen will not gel, it cannot be used as a substitute for gelatin in dishes like puddings and sauces.

On a side note, collagen is not only taken internally to improve hair, skin and nails. It's also a key component of wound healing and is used in wound dressings. Collagen dressing containing gelatin has been shown to be particularly valuable in the treatment of chronic wounds, as its biochemistry enhances signaling to cells responsible for creating granulation tissue.[13]

When Buying Poultry-Based Collagen, Opt for Organic

The take-home message here is that if you're going to use a poultry-based collagen supplement, make sure it's certified organic by the U.S. Department of Agriculture (USDA),[14] as this is the only organic label that relates directly to food.

While organic standards are imperfect, manufacturers of organic products bearing the USDA seal have to meet the strictest standards of any of the currently available organic labels, so it's still your best assurance of organic quality. Keep in mind products can contain varying levels of organic ingredients:

- Products labeled "100% Organic" must contain only organically produced ingredients and cannot contain preservatives or flavor enhancing chemicals, or traces of heavy metals or other contaminants in excess of tolerances set by the U.S. Food and Drug Administration (FDA).[15] Livestock also cannot be given growth hormones
- Products labeled "Certified Organic" or merely "Organic" must contain at least 95% organic ingredients
- The label "Made with Organic Ingredients" can contain anywhere between 70% to 95% organic ingredients

To ensure you're actually getting your money's worth, look for the "USDA Organic" label. The use of the organic seal shown above is optional, but the label must clearly state "Organic." The organic certification may not be perfect, but it is typically the best reassurance you can get if you do not know the direct source of your food.

Beware of brands that have "organic" in their brand name but don't actually bear the USDA label, or brands that try to trick you with words that look like "organic," such as "organix" or similar twists on the word. If it's not clearly spelled out on the label, and spelled correctly, it's not certified organic.

For Bovine-Based Products, Look for Grass Fed Certification

If the product is derived from bovines (cows), you'll want to make sure the product is certified grass fed. Keep in mind that this applies not only to collagen supplements but also to gelatin, commonly used in cooking and baking. In this case, the label you're looking for is the American Grassfed Certification label. The American Grassfed Association's logo is the only one able to guarantee the animals:

- Have been fed a 100% forage diet
- Have never been confined in a feedlot
- Have never received antibiotics or hormones
- Were born and raised on American family farms (a vast majority of the grass fed meats sold in grocery stores are imported, and without COOL labeling, there's no telling where it came from or what standards were followed)

How Are Collagen Supplements Made?

To understand what you're actually buying, it's worth knowing how collagen or bone broth products are actually made. Bone meal is essentially a byproduct of conventional livestock farming, with most of it coming from poultry operations. Once chickens are processed for their meat, the bone scraps are boiled in water to obtain bone broth. The liquid is strained to remove any remaining bone pieces and then dried into a powder.

As a result of this process, many of the contaminants found in the bone of the animal will be present in the final product, as evidenced by the featured lab testing. This is why the source of the collagen is so important.

If you start with a contaminated product — chickens fed genetically engineered (GE) corn laden with pesticides, for example, or animals that have received drugs or other contaminated feed — the end product will contain traces of those contaminants as well. The best if not only way to avoid them is to start with a pure source, in this case organically raised, pastured or grass fed animals, and make a collagen-rich soup at home.

How Collagen Benefits Your Body

As explained by Caroline Brochard-Garnier, communication manager for Rousselot, a producer of gelatin and collagen products for the drug, food and nutritional markets:[16]

"When a collagen peptide preparation with optimized molecular weight and proven bioavailability is ingested, small collagen peptides are absorbed quickly into the blood stream. The presence of these peptides in skin tissue, stimulate skin cells (fibroblasts) and activate multiple biochemical pathways which in turn leads to a response which is widely accepted:

Small collagen peptides are believed to act as a false signal of the destruction of collagen in the body, triggering the synthesis of new collagen fibers, which in turn increases skin suppleness and reduces the formation of wrinkles. In addition, the synthesis of hyaluronic acid is stimulated which leads to an increase in skin hydration."

There Are Many Safe Ways to Boost Your Collagen

Quality is always an overriding concern when buying a supplement, and collagen products are no different. Since they're derived from animal parts, the way those animals were raised and fed is of paramount importance. So, when buying a collagen supplement, be sure it's "USDA Organic" and/or AGA grass fed certified.

Many experts also recommend increasing consumption of collagen building blocks as well.[17] This includes vitamin C and anti-inflammatory, antioxidant-rich leafy greens and berries. This way, your body will have what it needs to preserve and produce the collagen needed.

Vitamin C plays an important role in collagen synthesis, so without vitamin C, your body's natural collagen production will be impacted. Hyaluronic acid has also been shown to improve skin moisture and suppleness and reduce wrinkles when added to the diet.[18] Here are a number of ways to boost your collagen level without having to resort to a supplement:

Making and consuming homemade bone broth, made from organic, pasture-raised poultry or grass fed and finished bovine bones and cartilage. Chicken feet are

excellent for this, as chicken claws are particularly rich in collagen[19]

Red light therapy, aka low-level laser light therapy or photobiomodulation, has been shown to increase collagen growth to reduce wrinkles and improve skin elasticity[20]

The antioxidant retinol increases the life span of collagen and blocks enzymes that destroy it

Ginseng, which has antioxidant and anti-inflammatory properties, has been found to increase collagen in the bloodstream and may have antiaging benefits[21]

Aloe vera, taken orally, nearly doubled hyaluronic acid and collagen production in study participants[22]

Hyaluronic acid, an important compound for collagen in the skin, can be found in beans and root vegetables, or taken as a supplement

Vitamin C has been shown to protect skin and boost collagen production in your body, as it helps the amino acids lysine and proline convert to collagen.[23] Fruits and vegetables rich in vitamin C include kiwi, oranges and other citrus fruits, tomatoes, **bell peppers** and **broccoli**

Antioxidants, which protect against damaging free radicals, enhance the effectiveness of existing collagen. Berries such as **blueberries**, blackberries and raspberries are good sources

Garlic contains sulfur, a necessary component for collagen production, as well as lipoic acid and taurine, which help rebuild damaged collagen fibers

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