



Chris Kresser

LET'S TAKE BACK YOUR HEALTH—Starting Now.

beginner's guide to

BONE BROTH



DISCOVER THE HIDDEN HEALTH BENEFITS
OF THIS NUTRIENT DENSE SUPER FOOD
(INCLUDES DIY RECIPES)

Why Bone Broth?

Traditional cooking uses meat bones as a base for delicious stock because it is the secret to cooking great recipes. The Weston A. Price Foundation and advocates of the Paleo and Primal lifestyles favor bone broth for its wide array of nutrients that are difficult to find in any other food source. Dr. Natasha Campbell-McBride has made bone and meat broth the foundation of the GAPS protocol because of its ability to heal and seal the gut lining and reduce overgrowth of harmful microbes.

Bones are full of collagen, which forms gelatin when simmered. Gelatin is what gives stock its solid consistency once it is cooled. Collagens are a large family of biomolecules that includes the glycosaminoglycans—special molecules that help keep our joints healthy. If the connective tissue such as tendons, ligaments, and cartilage is still attached, the bones in stock will provide our bodies with the whole spectrum of glycosaminoglycans, including chondroitin and glucosamine, which are raw materials for bone and cartilage formation.

Bone is also full of minerals and other nutrients such as iron, calcium, vitamin D, vitamin C and thiamin (B1). These nutrients are abundant in Paleo and GAPS diets and can protect against the harmful effects of toxins. Both animal and human studies have shown that low calcium intake increases the risk of lead toxicity. Similarly, low iron status makes people more likely to develop lead toxicity, and it increases gastrointestinal absorption of lead.¹ Bone broth offers a synergistic combination of nutrients that can protect your body from the harmful effects of toxins.

Heard bone broth is toxic? A study published in the journal Medical Hypothesis suggested that bone broth diets may be high in the toxic metal lead. In the study, levels of lead in bone broth made from chicken bones were a little over 7 times higher than tap water. Does this mean it's time to quit the bone broth? Not so fast.

Read more here.

¹ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1518938/>

Traditional diets are typically [much higher in gelatin](#) than our modern diets because these cultures wisely practiced nose-to-tail eating and consumed parts of the animal that are high in gelatin, such as skin, tendons, and other gelatinous cuts of meat. We've lost the practice of whole-animal eating, and vegetarians typically don't eat many (or any) animal products. This means that we're eating a lot less gelatin than our ancestors, if any at all.

Here are 6 reasons you want to make sure you're getting some gelatin in your diet.

1. Gelatin balances out your meat intake.

Eating broth provides us with nutrients that are different than those found in the animal's muscle protein.

Muscle meats and eggs are [high in methionine](#), an amino acid that raises homocysteine levels in the blood and increases our need for homocysteine-neutralizing nutrients like vitamins B6, B12, folate, and choline.

We don't want high homocysteine in our blood because [homocysteine is a significant risk factor](#) for serious diseases like heart disease, stroke, mental illness, and fractures. (This might even explain why researchers sometimes [find a correlation](#) between high meat intake and various diseases.)

Those eating lots of animal protein need adequate glycine to balance out the methionine from meat, and you'll get that from gelatin. For more information, check out Denise Minger's [awesome presentation](#), where she discusses this very issue.

2. Gelatin heals your gut.

Gelatin can [improve gut integrity and digestive strength](#) by enhancing gastric acid secretion and restoring a healthy mucosal lining in the stomach; low stomach acid and an impaired gut barrier are two common digestive problems in our modern society. Gelatin

also absorbs water and helps keep fluid in the digestive tract, promoting good intestinal transit and healthy bowel movements.

Gelatin-rich soups and broths are also one of the key components of the [GAPS diet](#), which has been designed to heal the gut and promote healthy digestion. And healthy intestinal cells prevent leaky gut, which is often at the root of many food intolerances, allergies, inflammatory conditions, and autoimmune diseases.

3. Gelatin makes your skin healthy and beautiful.

Gelatin is a known [promoter of skin health](#). Gelatin provides glycine and proline, two amino acids that are used in the [production of collagen](#). Collagen is one of the [primary structural elements](#) of skin, so providing the building blocks for this important protein can ensure that your body is able to create enough of it.

A diet rich in gelatin may also protect against the [aging effects of sunlight](#), preventing wrinkles in the future. So if you eat gelatin, you'll feel less guilty about getting regular, unprotected sun exposure to boost your vitamin D because your skin will be more resilient to damage!

4. Gelatin protects your joints.

Bodybuilders have been using gelatin for decades to help improve joint health and reduce inflammation. And research shows that athletes who took a [hydrolyzed collagen supplement](#) experienced less pain in their joints, which could help improve performance for athletes and competitive fitness buffs.

The amino acids glycine and proline, found in gelatin, are anti-inflammatory. If you exercise a lot, eating gelatin can help keep your joints healthy and pain-free. Also, if you have inflammatory joint or bone diseases like arthritis or osteoporosis, getting adequate gelatin can potentially help you manage [inflammation and pain in your joints](#) and [build stronger bones](#).

5. Gelatin improves your mood.

Another reason to eat bone broth (as well as fattier cuts of meat) is for its effect on mood. Lean muscle meats and eggs are high in methionine. Methionine competes with tryptophan for transport across the blood-brain barrier into the brain. Tryptophan is the precursor (raw material) for serotonin, a neurotransmitter that contributes to feelings of well-being. Serotonin, in turn, is a precursor to melatonin, a hormone that regulates sleep-wake cycles. Bone broth and fatty meats, on the other hand, are rich in glycine. Unlike methionine, glycine does not compete with tryptophan for transport across the blood-brain barrier. This is why a diet that includes bone broth and fattier cuts of meat can help prevent the depression and insomnia that some people may experience when eating a diet high in lean meat and eggs.

6. Gelatin helps you sleep.

Glycine from gelatin has been shown to help with sleep. One study found that three grams of glycine given to subjects before bedtime produced [measurable improvements in sleep quality](#). Many of my patients swear by gelatin as an effective sleep aid without bothersome side effects, in contrast to medications and even natural sleep aids like melatonin, which can sometimes cause grogginess.

Glycine is also an [inhibitory neurotransmitter](#), a type of chemical that can decrease anxiety and promote mental calmness. This is because glycine antagonizes norepinephrine, a stress hormone that causes feelings of anxiety and panic. Gelatin can thus help keep you calm and sleeping through the night.

Different Forms of Gelatin

The traditional way to get gelatin is from [skin](#), [gelatinous meats](#), and [bone broths](#). Those who eat a [Paleo or ancestral diet](#) can easily include these foods, but vegetarians will find it difficult to get gelatin from a largely plant-based diet. Gelatin is only found in animal foods that come from the body of the animal itself.

1. My favorite brand of gelatin is [Great Lakes](#), which comes from grass-fed animals. It's available in both [hydrolyzed](#) and [whole](#) form; each type has its own health benefits.
2. [Hydrolyzed](#) means the protein is broken into individual amino acids, making them easier to absorb. Use this type to improve skin and joint health or get better sleep. Hydrolyzed gelatin can be mixed into any type of liquid, including cold liquids, so it can be added to cold smoothies or juices easily. It also is great as a real food protein powder.
3. [Whole protein gelatin](#) is better for improving gut health. It helps carry fluid through the intestines and can even coat the lining of the digestive tract as a soothing and protective layer. This is the type used to make [gummies](#) or [Jell-O snacks](#) and must be mixed into warm liquids.
4. [Fish gelatin](#) is available for those who prefer not to consume land animals.

For vegetarians (and even omnivores), I recommend getting a high-quality gelatin powder to add to food or to create healthy gelatinous desserts. Gelatin is somewhat more environmentally friendly than lean meat because it uses parts of the animal that might not be used otherwise. And it's much easier to digest than normal muscle meat, making it a good gateway food for vegetarians branching out into a more ancestral diet. (And in case you think vegetarians aren't ever using any parts of the animal, think again.)

One population that may need to be careful about consuming gelatin or gelatin powders is those with histamine intolerance; some people report a histamine reaction to these foods and thus gelatin *may* not be appropriate for those with severe intolerances.

Buying Bone Broth

Bone broth seems to have countless benefits for joints, skin, mood, sleep, and protein balance, and it's rooted in a long history of human use. You can make your own bone broth or you can buy it pre-made.

If you plan to buy pre-made bone broth, make sure that you:

- Buy broth that's organic and made from pasture-raised animals or wild-caught fish. This minimizes toxins and maximizes the nutrients you get from the bone broth.
- Avoid containers, especially cans, that contain bisphenol A (BPA), which is a toxic, hormone-like molecule.

Many local stores don't sell bone broth. It is not the same as chicken or beef stock, which is widely available in grocery stores.

You can, however, find organic, unsalted bone broths online such as [Kettle & Fire](#):

Kettle & Fire is made from real bones, real ingredients and long cook times. Most store-bought broth (often labeled "stock") from the grocery store uses a mash of bone paste or poor-quality cuts of meat, and cooks their broth at high temperatures. This results in a watered down, non-gelling broth that's missing the amino acid and protein benefits of a real bone broth. In fact, next time you're at the grocery store, check the ingredients panel - many of these "broths" don't even use bones!

Other organic, pasture-raised bone broths are available from these brands:

- Grow and Behold
- KOL Foods
- Bare Bones Broth
- The Flavor Chef
- Real Bone Broth from Wise Choice Market

Making Bone Broth

During the process of making bone broth, we remove the active chemical ingredients from the bones into the water by means of heat, time, and acid. By cooking slowly over low heat, we extract as much nutrient content as possible. Later, when we make soups, we start with this fantastic broth and don't need to cook the soup's ingredients for quite as long, getting the highest nutritional punch from both the stock and soup ingredients. This will maximize flavor of both the broth and the resulting soup.

The flavor of the stock will come from the cartilage and connective tissue in the bones. Connective tissue has collagen in it, which gets converted into gelatin that thickens the liquid. Stock made from bones needs to be simmered for longer than stock made from meat.

Cookware

Ideal for making stock is a slow cooker, a great and inexpensive cooking tool. Because of the long cooking time involved, a slow cooker makes it much easier to be able to leave the house while you're making your stock. If you're using a good stock pot to make your broth, a safe method is to start the stock pot before breakfast and let it simmer slowly until dinner.

Selecting Bones

Beef or chicken bones are most commonly used to make bone broth. Grass-fed beef and farm-raised, free-range chickens give the best results. According to the Weston A. Price Foundation, "many battery-raised chickens will not produce stock that gels." Obtaining local bones from a farmer or finding a knowledgeable local butcher are two simple ways to seek out bones from grass-fed beef or free-range birds.

You can use poultry like chicken, duck, or turkey, or larger animals like beef, lamb, venison, or pork, or you can use fish. The method for each will be generally the same, but each type will give its own unique flavor. Mixing bones from different animals is possible;

however, mammals and birds have different cooking times due to the size of the bones. Poultry bones are much softer and need less cooking time. Fish take even less time.

In the traditional culinary arts, the bones of young animals, such as veal, have been preferred for making stock. Younger bones contain more collagen than those of their elders.

Hooves, feet and heads have been especially prized in traditional cooking because they contain the most gelatin. Seek out valuable chicken feet, chicken heads and necks, or calves feet (and heads and necks, if you can find them) from your local farm or butcher. These can often be purchased in bulk and frozen. Two to four chicken feet can be added to each chicken stock, and about two pounds of calves feet (or less, depending on what can fit in the pot) can be used for beef stock.

When selecting beef bones, seek out any cuts with a lot of bone in them, including some knuckle bones if possible. Marrow bones are excellent.

Chicken stock, in general, can be made from one whole free-range chicken (including necks and feet), or two to three pounds of bony chicken parts, such as necks, backs, breastbones, and wings. If you are using a whole chicken, cut off the wings and remove the neck, fat glands, and the gizzards from the cavity. Cut chicken parts into several pieces.

Fish stock is quick and easy to make and is a magnificent base for fish soups, chowders, and any number of sauces and other uses. The best fish bones to use are those from mild, lean, white fish like halibut, cod, or flounder. Fish to avoid are salmon, trout, mackerel or other oily, fatty fish. To make one pot of stock, the Weston A. Price Foundation recommends using “3 or 4 whole carcasses, including heads, of non-oily fish such as sole, turbot, rockfish or snapper.” According to the Foundation:

Ideally, fish stock is made from the bones of sole or turbot. In Europe, you can buy these fish on the bone. The fish monger skins and filets the fish for you, giving you the filets for your evening meal and the bones for making the stock and final sauce. Unfortunately, in America sole arrives at the fish market pre-boned. But snapper, rock fish and other nonoily fish work equally well; and a good fish merchant will save the carcasses for you if you ask him. As he normally throws these carcasses away, he shouldn't charge you for

them. Be sure to take the heads as well as the body—these are especially rich in iodine and fat-soluble vitamins. Classic cooking texts advise against using oily fish such as salmon for making broth, probably because highly unsaturated fish oils become rancid during the long cooking process.

You can also use leftover bones from your meals. These can be collected, with or without skin and meat, and saved in a freezer bag until ready for use. It's quite thrifty: making stock from the leftover bones of a roast chicken gives you an extra meal from the bird.

Preparing Bones

Browning the bones before adding to the stock pot is optional. Roasting the bones gives the stock more richness of flavor and a darker color. In traditional cooking, “white stock” is made from uncooked bones that are put straight into the stock pot, while “brown stock” is made from bones that have been roasted first.

Some people like to fracture the bones into smaller pieces prior to stewing in order to release additional bone nutrients, marrow fat, and vitamins. If desired, this can be done by asking the butcher to cut them for you, or placing bones in a sturdy bag and (carefully) smashing them with a hammer. With chicken, a knife or kitchen scissors can break the bones into smaller pieces, ideally two to three inches long, to increase the surface area of bone exposed to water. If the bones are cut into smaller pieces first, this will reduce the necessary cooking time.

Other Additions

Vinegar is added to bone broth, as the minerals are extracted better in an acid medium. Acid helps break down the cartilage and other connective tissues in the bones, thus accelerating the formation of gelatin. The acid used is generally vinegar, tomato (in the case of brown stocks), and/or wine. White stock and chicken stock sometimes use white wine, and fish stock almost always does.

Although not necessary, many people like to add vegetables, herbs, and spices to their simmering stock. When choosing to add vegetables, traditionally, meat is cooked on its own first before the vegetables, and the “scum” that rises to the surface is skimmed off before further ingredients are added.

Onions, carrots, and celery are the key vegetable ingredients to add to broth. Less commonly used vegetables include leeks, scallions, garlic, fennel, lettuce, parsnips, squash, bell peppers, mushrooms, etc. Some vegetables have overpowering flavors that may alter the final taste of the stock. Some examples of vegetables you might want to avoid are broccoli, asparagus, cabbage, Brussels sprouts, cauliflower, or turnips.

Some recommended herbs and spices for broth are garlic, bay leaf, parsley, sage, and peppercorn.

Slow Cooking

The basic method for cooking stock is this: Put the bones, browned or not, into a stock pot or a slow cooker. Cover with filtered, cold water, enough to cover the bones by an inch. Add vinegar to draw the minerals out of the bones.

Turn heat on medium and slowly bring to a low boil, avoiding a hard boil. When it starts to boil, turn the heat down and maintain a very slow simmer. Remove any scum that has risen to the top. After skimming, you can add vegetables and fresh or dry herbs. Simmer six to 48 hours for chicken and 12 to 72 hours for beef.

Low heat is used to slowly simmer the nutrient material (vitamins, minerals, amino acids, and glycosaminoglycan growth factors) from bone and joint because low heat is gentle and not destructive. We want to maintain the integrity of the entire complex of cartilage components, some of which have yet to be identified, plus vitamins and minerals. So avoid allowing the broth to reach the point of a fast boil. The longer it simmers, the better the resulting broth.

Strain and Cool

Allow the soup to cool. Remove the large bones with tongs. Strain the soup in a fine strainer. If you line the colander or sieve with cheesecloth, you will have a clearer stock, but it is not necessary.

If uncooked meat was used to start the stock with, then after straining, the meat can be reserved for soup or salads.

After straining, it is recommended to sort through the bones to find any that have available marrow. Scoop the remaining marrow out of the bones that contain it, and eat it for its nutrients. You may have to pound the bone against a cutting board to get the marrow out. An easy way to eat marrow is to stir it back into your stock or simply add it to your soups.

If you want to remove the fat after the stock is strained and cooled, the fat will float, separate, and solidify into a layer on top of the stock. It can be then removed with ease. This fat can be used for cooking (frying, sautéing) or for adding into your soup or broth recipe. In the book *Gut and Psychology Syndrome*, Dr. Natasha Campbell-McBride recommends, “Do not take fat out of the stock; it is important for your GAPS patient to consume the fat together with the stock.” This fat is one of the many gut-healing elements of the stock. Also note to only use the fat if the bones are from grass-fed beef or pastured chickens due to the improper balance of omega-6 fats in factory-farmed animals.

Cooking Time

The longer the stock simmers, the stronger and richer the taste. Length of time is up to you. If time is short, it's okay to come home and simmer stock for the evening for just a few hours. Generally the very minimum amount of time recommended is three hours.

Storing

Homemade stock can be stored, covered, in the refrigerator for about five days, or in the freezer for several months. A helpful tip is to always label a package or container with the name of the food and the date it was stored. Some people use the “ice cube” method of putting stock in ice cube trays, freezing for 24 hours until solid, and then taking them out and putting them into a labeled freezer bag, so that they can later be taken out two or three at a time for use in recipes.

Uses for Broth

Broth is a very popular traditional food promoted by the Weston A. Price Foundation. Dr. Natasha Campbell-McBride puts even more emphasis on broth in the GAPS diet, and it is the mainstay of the GAPS “Intro” protocol.

Broth can be heated on the stovetop, poured into a mug, and sipped like tea. It is traditionally used as a first course in meals to enhance the digestion of the food to come. Meat and bone stock are important bases for gravy and sauces. Delicious soups can be made with the broth as a base. Broth can be used any time cooking liquid is called for.

Broth Recipes

Simple Chicken Stock

Source: Weston A. Price Foundation

Ingredients:

- 1 whole free-range chicken or 2 to 3 pounds of bony chicken parts, such as necks, backs, breastbones and wings*
- gizzards from one chicken (optional)
- 2-4 chicken feet (optional)
- 4 quarts cold filtered water
- 2 tablespoons vinegar
- 1 large onion, coarsely chopped
- 2 carrots, peeled and coarsely chopped
- 3 celery stalks, coarsely chopped
- 1 bunch parsley

*Note: Farm-raised, free-range chickens give the best results. Many battery-raised chickens will not produce stock that gels.

Preparation:

If you are using a whole chicken, cut off the wings and remove the neck, fat glands, and the gizzards from the cavity. Cut chicken parts into several pieces. (If you are using a whole chicken, remove the neck and wings and cut them into several pieces.) Place chicken or chicken pieces in a large stainless steel pot with water, vinegar, and all vegetables except parsley. Let stand 30 minutes to 1 hour. Bring to a boil, and remove scum that rises to the top. Reduce heat, cover, and simmer for 6 to 8 hours. The longer you cook the stock, the richer and more flavorful it will be. About 10 minutes before finishing the stock, add parsley. This will impart additional mineral ions to the broth.

Remove whole chicken or pieces with a slotted spoon. If you are using a whole chicken, let cool and remove chicken meat from the carcass. Reserve for other uses, such as chicken salads, enchiladas, sandwiches or curries. Strain the stock into a large bowl and reserve in your refrigerator until the fat rises to the top and congeals. Skim off this fat and reserve the stock in covered containers in your refrigerator or freezer.

Beef Bone Broth

Source: Balanced Bites

This recipe make approximately 64 ounces of broth depending on how much water you use, how much you reduce the broth, and how strong you like the flavor to be.

Ingredients:

- 4 quarts of filtered water
- 1.5 to 2 pounds of beef knuckle bones (or any other kinds of bones/meaty bones/marrow bones)
- the cloves from 1 whole head of fresh garlic, peeled & smashed
- 2 tablespoons organic, unfiltered apple cider vinegar
- 1 teaspoon unrefined sea salt, or to taste

Preparation:

If you choose, you may brown or roast the bones/meaty bones first in a separate pan/pot if using a crockpot, but this isn't a necessary step. I don't normally do it because it saves time/dishes not to and the purpose is just for more flavor, which I don't find necessary in this recipe. If you choose to, brown them in bacon fat or coconut oil before putting them into the water in the next step.

Place all ingredients in a 6-quart crockpot and set the heat to HIGH. Bring the stock to a boil, then reduce the heat setting to LOW. Allow the stock to cook for a minimum of 8 hours and up to 24 hours. The longer it cooks the better!

Turn off the crockpot and allow the stock to cool. Strain the stock through a fine mesh metal strainer and throw away what you skim off. Place the cooled stock into glass jars for storage in the fridge (for up to a few days) or freezer for later use.

Variations:

- Use any other kind of animal bones you like; chicken especially will take less time due to smaller pieces.
- Add chopped veggies like carrots, celery, and onions for more flavor or variety.
- A crockpot makes this recipe super-simple, but you can also use a large stock pot (hence the name) or an enameled cast-iron Dutch oven type of pot.

Fish Stock Recipe

Source: Dinner Tool

This is a strong, fresh-tasting base for any fish soup.

Ingredients:

- 4 to 5 pounds assorted fish heads (gills removed), skeletons, and scraps, taken from white-fleshed fish
- 3 or 4 tomatoes, roughly chopped (canned are fine; include their liquid)
- 3 carrots, peeled and cut into chunks
- 2 medium onions or 1 large onion, quartered (don't bother to peel them)
- 2 celery stalks, cut into chunks
- 3 cloves, garlic, unpeeled
- 1 clove
- 10 peppercorns
- 2 bay leaves
- 2 or 3 sprigs fresh thyme or 1/2 teaspoon dried thyme
- 1/2 cup roughly chopped fresh parsley (some stems are fine)
- 2 tablespoons olive oil
- Salt and freshly ground black pepper to taste
- 1/2 lemon, rind and all
- About 4 quarts water (16 cups)

Preparation:

Combine all ingredients in a stockpot. Bring just about to a boil, then partially cover and adjust the heat so the mixture sends up a few bubbles at a time. Cook at a slow simmer for 45 minutes.

Strain, then taste and add salt if necessary. Cool to room temperature and refrigerate for 2 to 3 days (longer if you boil it every second day), or freeze.