

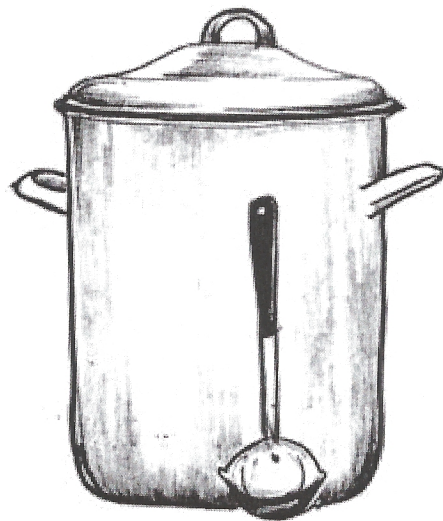
## Broth is Beautiful

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“Good broth will resurrect the dead,” says a South American proverb. Said Escoffier: “Indeed, stock is everything in cooking. Without it, nothing can be done.”

A cure-all in traditional households and the magic ingredient in classic gourmet cuisine, stock or broth made from bones of chicken, fish and beef builds strong bones, assuages sore throats, nurtures the sick, puts vigor in the step and sparkle in love life—so say grandmothers, midwives and healers. For chefs, stock is the magic elixir for making soul-warming soups and matchless sauces.



Meat and fish stocks play a role in all traditional cuisines—French, Italian, Chinese, Japanese, African, South American, Middle Eastern and Russian. In America, stock went into gravy and soups and stews. That was when most animals were slaughtered locally and nothing went to waste. Bones, hooves, knuckles, carcasses and tough meat went into the stock pot and filled the house with the aroma of love. Today we buy individual filets and boneless chicken breasts, or grab fast food on the run, and stock has disappeared from the American tradition.

### Grandmother Knew Best

Science validates what our grandmothers knew. Rich homemade chicken broths help cure colds. Stock contains minerals in a form the body can absorb easily—not just calcium but also magnesium, phosphorus, silicon, sulphur and trace minerals. It contains the broken down material from cartilage and tendons—stuff like chondroitin sulphates and glucosamine, now sold as expensive supplements for arthritis and joint pain.

Fish stock, according to traditional lore, helps boys grow up into strong men, makes childbirth easy and cures fatigue. “Fish broth will cure anything,” is another South American proverb. Broth and soup made with fishheads and carcasses provide iodine and thyroid-strengthening substances.

When broth is cooled, it congeals due to the presence of gelatin. The use of gelatin as a therapeutic agent goes back to the ancient Chinese. Gelatin was probably the first functional food, dating from the invention of the “digestor” by the Frenchman Papin in 1682. Papin’s digestor consisted of an apparatus for cooking bones or meat with steam to extract the gelatin. Just as vitamins occupy the center of the stage in nutritional investigations today, so two hundred years ago gelatin held a position in the forefront of food research. Gelatin was universally acclaimed as a most nutritious foodstuff particularly by the French, who were seeking ways to feed their armies and vast numbers of homeless in Paris and other cities. Although gelatin is not a complete protein, containing only the amino acids arginine and glycine in large amounts, it acts as a protein sparer, helping the poor stretch a few morsels of meat into a complete meal. During the siege of Paris, when vegetables and meat were scarce, a doctor named Guerard put his patients on gelatin bouillon with some added fat and they survived in good health.

The French were the leaders in gelatin research, which continued up to the 1950s. Gelatin was found to be useful in the treatment of a long list of diseases including peptic ulcers, tuberculosis, diabetes, muscle diseases, infectious diseases, jaundice and cancer. Babies had fewer digestive problems when gelatin was added to their milk. The American researcher Francis Pottenger pointed out that as gelatin is a hydrophilic colloid, which means that it attracts and holds liquids, it facilitates digestion by attracting digestive juices to food in the gut. Even the epicures recognized that broth-based soup did more than please the taste buds. "Soup is a healthy, light, nourishing food" said Brillant-Savarin, "good for all of humanity; it pleases the stomach, stimulates the appetite and prepares the digestion."

## Attention to Detail

Stock or broth begins with bones, some pieces of meat and fat, vegetables and good water. For beef and lamb broth, the meat is browned in a hot oven to form compounds that give flavor and color—the result of a fusion of amino acids with sugars, called the Maillard reaction. Then all goes in the pot—meat, bones, vegetables and water. The water should be cold, because slow heating helps bring out flavors. Add vinegar to the broth to help extract calcium—remember those egg shells you soaked in vinegar until they turned rubbery.

Heat the broth slowly and once the boil begins, reduce heat to its lowest point, so the broth just barely simmers. Scum will rise to the surface. This is a different kind of colloid, one in which larger molecules—impurities, alkaloids, large proteins called lectins—are distributed through a liquid. One of the basic principles of the culinary art is that this effluvium should be carefully removed with a spoon. Otherwise the broth will be ruined by strange flavors. Besides, the stuff looks terrible. "Always Skim" is the first commandment of good cooks.

Two hours simmering is enough to extract flavors and gelatin from fish broth. Larger animals take longer—all day for broth made from chicken, turkey or duck and overnight for beef broth.

Broth should then be strained. The leavings, picked over, can be used for terrines or tacos or casseroles. Perfectionists will want to chill the broth to remove the fat. Stock will keep several days in the refrigerator or may be frozen in plastic containers. Boiled down it concentrates and becomes a jellylike fumée or demi-glaze that can be reconstituted into a sauce by adding water.

## Cutting Corners

Research on gelatin came to an end in the 1950s because the food companies discovered how to induce Maillard reactions and produce meat-like flavors in the laboratory. In a General Foods Company report issued in 1947, chemists predicted that almost all natural flavors would soon be chemically synthesized. And following the Second World War, food companies also discovered monosodium glutamate (MSG), a food ingredient the Japanese had invented in 1908 to enhance food flavors, including meat-like flavors. Humans actually have receptors on the tongue for glutamate. It is the protein in food that the human body recognizes as meat.

Any protein can be hydrolyzed to produce a base containing free glutamic acid or MSG. When the industry learned how to make the flavor of meat in the laboratory, using inexpensive proteins from grains and legumes, the door was opened to a flood of new products including bouillon cubes, dehydrated soup mixes, sauce mixes, TV dinners and condiments with a meaty taste. "Homemade" soup in most restaurants begins with a powdered soup base that comes in a package or can and almost all canned soups and stews contain MSG, often found in ingredients called hydrolyzed portoins. The fast food industry could not exist without

MSG and artificial meat flavors to make “secret” sauces and spice mixes that beguile the consumer into eating bland and tasteless food.

Short cuts mean big profits for producers but the consumer is short changed. When homemade stocks were pushed out by cheap substitutes, an important source of minerals disappeared from the American diet. The thickening effects of gelatin could be mimicked with emulsifiers but the health benefits were lost.

Most serious, however, were the problems posed by MSG, problems the industry has worked very hard to conceal from the public. In 1957, scientists found that mice became blind and obese when MSG was administered by feeding tube. In 1969, MSG-induced lesions were found in the hypothalamus region of the brain. Other studies all point in the same direction—MSG is a neurotoxic substance that causes a wide range of reactions, from temporary headaches to permanent brain damage.

Why do consumers react to factory-produced MSG and not to naturally occurring glutamic acid found in food? One theory is that the glutamic acid produced by hydrolysis in factories contains many isomers in the right-handed form, whereas natural glutamic acid in meat and meat broths contains only the left-handed form. L-glutamic acid is a precursor to neurotransmitters, but the synthetic form, d-glutamic acid, may stimulate the nervous system in pathological ways.

## A “Brothal” in Every Town

Peasant societies still make broth. It is a necessity in cultures that do not use milk because only stock made from bones and dairy products provides calcium in a form that the body can easily assimilate. It is also a necessity when meat is a luxury item, because gelatin in properly made broth helps the body use protein in an efficient way.

Thus, broth is a vital element in Asian cuisines—from the soothing long-simmered beef broth in Korean soups to the foxy fish broth with which the Japanese begin their day. Genuine Chinese food cannot exist without the stockpot that bubbles perpetually. Bones and scraps are thrown in and mineral-rich stock is removed to moisten stir-frys. Broth-based soups are snack foods from Thailand to Manchuria.

Asian restaurants in the US are likely to take shortcuts and use a powdered base for sweet and sour soup or kung pau chicken but in Japan and China and Korea and Thailand, mom-and-pop businesses make broth in steamy back rooms and sell it as soup in store fronts and on street corners.

What America needs is healthy fast food and the only way to provide this is to put brothals in every town, independently owned brothals that provide the basic ingredient for soups and sauces and stews. And brothals will come when Americans recognize that the food industry has prostituted itself to short cuts and huge profits, shortcuts that cheat consumers of the nutrients they should get in their food and profits that skew the economy towards industrialization in farming and food processing.

Until our diners and carryouts become places that produce real food, Americans can make broth in their own kitchens. It's the easy way to produce meals that are both nutritious and delicious—and to acquire the reputation of an excellent cook.

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### Sidebars

### Heads and Feet

If you've ever shopped in Europe, you've noticed that calves feet are displayed at the local butchers and chickens come with their heads and feet attached. Hooves, feet and heads are the most gelatinous portions of the animal and fetch high prices in traditional economies. In fact, Tysons exports the feet from American chickens to China. Jewish folklore considers the addition of chicken feet the secret to successful broth.

It's hard to find these items in America. Asian and Latin American markets sometimes carry whole birds and some butchers in ethnic neighborhoods carry calves feet. If you have freezer space, you can buy frozen chicken feet and calves feet in bulk from meat wholesalers that cater to the restaurant trade. Have the butcher cut the calves feet into one-inch cubes and package them in 1-quart bags. For the most satisfactory results, use 2-4 chicken feet for chicken stock and about 2 pounds calves feet pieces for a large pot of beef stock.

## Sauce Basics

Meat sauces are made from stocks that have been flavored and thickened in some way. Once you have learned the technique for making sauces—either clear sauces or thick gravies—you can ignore the recipe books and be guided by your imagination.

**Reduction Sauces** are produced by rapid boiling of gelatinous stock to produce a thick, clear sauce. The first step is to “deglaze” coagulated meat juices in the roasting pan or skillet by adding *1/2 cup to 1 cup wine or brandy*, bringing to a boil and stirring with a wooden spoon to loosen pan drippings. Then add *3 to 4 cups stock*, bring to a boil and skim. (Use chicken stock for chicken dishes, beef stock for beef dishes, etc.) The sauce may now be flavored with any number of ingredients, such as *vinegar, mustard, herbs, spices, fresh orange or lemon juice, naturally sweetened jam, garlic, tomato paste, grated ginger, grated lemon rind, creamed coconut, whole coconut milk or cultured cream*. Let sauce boil vigorously, uncovered, until reduced by at least one half, or until desired thickness is achieved. You may add about *1-2 teaspoons gelatin* to promote better thickening, although this should be avoided by those with MSG sensitivities (as gelatin contains small amounts of MSG). Another way to thicken is to mix *2 tablespoons arrowroot powder* with *2 tablespoons water*. Gradually add this to the boiling sauce until the desired thickness is obtained. If sauce becomes too thick, thin with a little water. The final step in sauce-making is to taste and add *sea salt* if necessary.

Gravies are thickened with flour rather than by reduction. They are suitable for meats like roast chicken and turkey, which drip plenty of fat into the pan while cooking. After removing the roasting fowl and roasting rack, place pan on a burner. You should have at least *1/2 cup good fat drippings*—if not, add some butter, goose fat or lard. Add about *1/2 cup unbleached flour* to the fat and cook over medium high heat for several minutes, stirring constantly, until the flour turns light brown. Add *4 to 6 cups warm stock*, bring to a boil and blend well with the fat-flour mixture, using a wire whisk. Reduce heat and simmer 10 minutes or so. Check for seasonings and add sea salt and pepper if necessary. You may also add *herbs, cream, butter, whole coconut milk or creamed coconut*.

## Recipes

### Chicken Stock

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.

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 Stock

- about 4 pounds beef marrow and knuckle bones
- 1 calves foot, cut into pieces (optional)
- 3 pounds meaty rib or neck bones
- 4 or more quarts cold filtered water
- 1/2 cup vinegar
- 3 onions, coarsely chopped
- 3 carrots, coarsely chopped
- 3 celery stalks, coarsely chopped
- several sprigs of fresh thyme, tied together
- 1 teaspoon dried green peppercorns, crushed
- 1 bunch parsley

Place the knuckle and marrow bones and optional calves foot in a very large pot with vinegar and cover with water. Let stand for one hour. Meanwhile, place the meaty bones in a roasting pan and brown at 350 degrees in the oven. When well browned, add to the pot along with the vegetables. Pour the fat out of the roasting pan, add cold water to the pan, set over a high flame and bring to a boil, stirring with a wooden spoon to loosen up coagulated juices. Add this liquid to the pot. Add additional water, if necessary, to cover the bones; but the liquid should come no higher than within one inch of the rim of the pot, as the volume expands slightly during cooking. Bring to a boil. A large amount of scum will come to the top, and it is important to remove this with a spoon. After you have skimmed, reduce heat and add the thyme and crushed peppercorns.

Simmer stock for at least 12 and as long as 72 hours. Just before finishing, add the parsley and simmer another 10 minutes. You will now have a pot of rather repulsive-looking brown liquid containing globs of gelatinous and fatty material. It doesn't even smell particularly good. But don't despair. After straining you will have a delicious and nourishing clear broth that forms the basis for many other recipes in this book.

Remove bones with tongs or a slotted spoon. Strain the stock into a large bowl. Let cool in the refrigerator and remove the congealed fat that rises to the top. Transfer to smaller containers and to the freezer for long-term storage.

## Fish Stock

3 or 4 whole carcasses, including heads, of non-oily fish such as sole, turbot, rockfish or snapper  
2 tablespoons butter  
2 onions, coarsely chopped  
1 carrot, coarsely chopped  
several sprigs fresh thyme  
several sprigs parsley  
1 bay leaf  
1/2 cup dry white wine or vermouth  
1/4 cup vinegar  
about 3 quarts cold filtered water

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 preboned. But snapper, rock fish and other non-oily 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.

Melt butter in a large stainless steel pot. Add the vegetables and cook very gently, about 1/2 hour, until they are soft. Add wine and bring to a boil. Add the fish carcasses and cover with cold, filtered water. Add vinegar. Bring to a boil and skim off the scum and impurities as they rise to the top. Tie herbs together and add to the pot. Reduce heat, cover and simmer for at least 4 hours or as long as 24 hours. Remove carcasses with tongs or a slotted spoon and strain the liquid into pint-sized storage containers for refrigerator or freezer. Chill well in the refrigerator and remove any congealed fat before transferring to the freezer for long-term storage.