8

STOCKS

The importance of stocks in the kitchen is indicated by the French word for stock: ***fond***, meaning "foundation" or "base." In classical cuisine, the ability to prepare good stocks is the most basic of all skills because so much of the work of the entire kitchen depends on them. A good stock is the foundation of soups, sauces, and most braised foods and stews.

In modern kitchens, stocks have lost much of the importance they once had. In the first place, increased reliance on portion-controlled meats has made bones for stock a rarity in most establishments. Second, making stocks requires extra labor, which most restaurants today aren't able to provide. Finally, more food today is served without sauces, so stocks aren't seen to be quite as necessary. Nevertheless, the finest cuisine still depends on soups and sauces based on high-quality stocks, so stock-making remains an essential skill you should learn early in your training.

AFTER READING THIS CHAPTER, YOU SHOULD BE ABLE TO

1. Prepare the basic ingredients for stocks.
2. Prepare basic stock and stock products, including white beef or veal stock, chicken stock, brown stock, fish fumet, vegetable stock, and glazes.

INGREDIENTS

The preparation of stocks has been simplified in many ways since the days of Escoffier, although this does not mean it demands less care or skill. Few chefs today bother to tie vegetables for a stock into a bundle, for example. They're going to be strained out anyway. The number and variety of ingredients is usually not as great as it once was. Nor is it common to cook stocks for as many hours as was once thought necessary. All these details are taken up one by one in this section.

A **stock** may be defined as a clear, thin—that is, unthickened—liquid flavored by soluble substances extracted from meat, poultry, and fish, and their bones, and from vegetables and seasonings. Our objective in preparing stocks is to select the proper ingredients and then to extract the flavors we want—in other words, to combine the correct ingredients with the correct procedure.

BONES

Bones are the major ingredient of stocks (except water, of course). Most of the flavor and body of stocks are derived from the bones of beef, veal, chicken, fish, and, occasionally, lamb, pork, ham, and game. (Vegetable stocks, an exception, draw their flavor entirely from vegetables; p. 162.)

The kinds of bones used determine the kind of stock.

Chicken stock, of course, is made from chicken bones.

White stock is made from beef or veal bones, or a combination of the two. Chicken bones or even pork bones are sometimes added in small quantity.

Brown stock is made from beef or veal bones that have been browned in an oven.

Fish stock is made from fish bones and trimmings left over after filleting. Bones from lean white fish give the best stock. Fat fish are not normally used. The term ***fumet*** is often used for a flavorful fish stock, especially one made with wine.

Lamb, game, turkey, and other stocks have specialized uses.

In Chapter 6, we discussed a group of proteins called ***connective tissue***. Remember that some of these proteins are dissolved when cooked with slow, moist heat. Chapter 16, Understanding Meats, offers more information about these substances. You should learn and understand these two basic facts:

1. When certain connective tissues (called ***collagen***) break down, they form ***gelatin***. This gives body to a stock, an important feature of its quality. A well-made stock thickens or even solidifies when chilled.
2. ***Cartilage*** is the best source of gelatin in bones. Younger animals have lots of cartilage in their skeletons. As they become older, this hardens into solid bone, which is harder to dissolve into stocks. ***Knuckle bones***, on the joints of major bones, have a lot of cartilage and are valued in stock-making. Neck bones and shankbones are also used a great deal.

Cut large bones into pieces about 3 inches (8 cm) long. This exposes more surface area and aids extraction. Also, the bones are easier to handle.

SOLUBLE COMPONENTS OF BONES AND MEAT

About 10 percent of muscle tissue is soluble in water. This includes about 1 percent collagen, which breaks down and forms gelatin, giving body to stocks and broths. Bones, by contrast, contain about 20 percent collagen. Of course, not all this collagen is extracted during stock making, but these numbers give you an idea why stocks made from bones contain much more gelatin than broths made from meats.

On the other hand, the remaining soluble materials in muscle tissue include other proteins, amino acids, carbohydrates, and minerals. These give a full, meaty flavor to well-made broths. Bones, by contrast, contain little of these components, so stocks made with no meat have a more neutral flavor, suitable for a wide variety of sauces and other products.

MEAT

Because of its cost, meat is rarely used in stock-making anymore. (Exception: Chicken hearts and gizzards are often used in chicken stock.)

Occasionally, a broth is produced as a result of simmering meat or poultry, as when fowl is cooked for dishes like creamed chicken. This broth can then be used like a stock. However, the chicken is considered the object of the game in this case. The broth is just a byproduct.

In this book, we use the word **broth** to mean a flavorful liquid obtained from the simmering of meats and/or vegetables. Broths are discussed in more detail in Chapter 10.

MIREPOIX

Aromatic vegetables are the second most important contributors of flavor to stocks. (In the case of vegetable stocks, they are the most important.)

Mirepoix (meer-pwah) is a combination of onions, carrots, and celery. It is a basic flavoring preparation used in all areas of cooking—not only for flavoring stocks but also for sauces, soups, meats, poultry, fish, and vegetables. Mirepoix ingredients have a fairly neutral taste, so that they contribute important flavor to stock without making it taste like any particular vegetable. (The classical mirepoix of decades ago contained a wider variety of ingredients, sometimes including ham or bacon, leeks and other vegetables, and one or more fresh herbs. The modern version is considerably simplified.)

Learn the proportions in Table 8.1 well. Mirepoix is a basic preparation you will need throughout your career.

A ***white mirepoix*** is used when it is necessary to keep the stock as colorless as possible, especially for fish stock. Carrots are not used in white mirepoix because they give too much color. Parsnips may be substituted for the carrots, or else the carrots may simply be omitted and the quantities of the other ingredients increased. Celery root, also called celeriac, can be substituted for the stalk celery for an even whiter mirepoix. Mushroom trimmings may also be added. When cost permits, it is a good idea to include leeks in the mirepoix in place of part of the onions in a white mirepoix, as indicated in Table 8.1. They give an excellent flavor. (*Note*: Many chefs prefer to use a standard mirepoix rather than white mirepoix for all stocks.)

In vegetable stocks, a variety of vegetables is used in addition to or in place of the traditional mirepoix; see page 163 for a brief discussion.

Cutting Mirepoix

Chop the vegetables coarsely into pieces of relatively uniform size. As mirepoix is rarely served, it is not usually necessary to cut it neatly.

The size depends on how long the mirepoix will cook. If it will cook a long time, as for beef stock, cut the vegetables into large pieces (1–2 inches; 3–5 cm). Cutting into small pieces is necessary for releasing flavors in a short time, as when the mirepoix will be used for fish stock.



Standard mirepoix (left) and white mirepoix (right)

TABLE 8.1 Mirepoix

To Make:	1 Pound	500 Grams
Standard Mirepoix		
Onions	8 oz	250 g
Celery	4 oz	125 g
Carrots	4 oz	125 g
White Mirepoix (with parsnips)		
Onions	4 oz	125 g
Leeks	4 oz	125 g
Celery or celeriac	4 oz	125 g
Parsnips	4 oz	125 g
White Mirepoix (without parsnips)		
Onions	6 oz	190 g
Leeks	5 oz	155 g
Celery or celeriac	5 oz	155 g
Optional addition to white mirepoix		
Mushroom trimmings	2 oz	60 g

ACID PRODUCTS

Acids, as noted in Chapter 6 (p. 114), help dissolve connective tissues. Thus, they are sometimes used in stock-making to extract flavor and body from bones, as well as contributing their own flavor.

Tomato products contribute flavor and some acid to brown stocks. They are not used for white stocks because they would give an undesirable color. Similarly, when making brown stocks, be careful not to add too much tomato, which can make the stock cloudy.

Wine is occasionally used, especially for fish stocks. Its flavor contribution is probably more important than its acidity.

SCRAPS AND LEFTOVERS

In some kitchens, a stockpot is kept going all day, and scraps are constantly being thrown in. This may or may not be a good idea.

Scraps may be used in stocks if they are ***clean, wholesome, and appropriate to the stock being made***. If done correctly, stock-making is a good way of utilizing trimmings that would otherwise be thrown out. It is better to save trimmings and use them in a planned way than to throw them into the stock randomly.

A stockpot is not a garbage disposal. The final product is only as good as the ingredients and the care that go into it.



FIGURE 8.1 To make a sachet, place the spices and herbs in the center of a square of clean cheesecloth. Draw the corners together and tie with a length of twine. For making stock, use a piece of twine long enough to be tied to the handle of the stockpot for easy removal.



FIGURE 8.2 Tie the herbs and aromatic vegetables for a bouquet garni in a bundle. To tie small herbs securely, enclose them between the two halves of leek.

SEASONINGS AND SPICES

Salt is usually not added when making stocks. Stocks are never used as is but are reduced, concentrated, and combined with other ingredients. If salt were added, it might become too concentrated. Some chefs salt stocks very lightly because they feel it aids in extracting flavor.

Herbs and spices should be used only lightly. They should never dominate a stock or have a pronounced flavor.

Herbs and spices are usually tied in a cheesecloth bag called a **sachet d'épices** (sa-shay day peace; French for "spice bag"), often called simply ***sachet*** for short. The sachet (Fig. 8.1) is tied by a string to the handle of the stockpot so it can be removed easily at any time.

A **bouquet garni** (boo-kay gar-nee) is an assortment of fresh herbs and other aromatic ingredients tied in a bundle with string. A basic bouquet garni contains pieces of leek and celery, thyme sprigs, bay leaf, and parsley stems (Fig. 8.2). The ingredients can be changed to suit different recipes. Escoffier includes only parsley, thyme, and bay leaf in the classic bouquet garni.

The following seasonings, in varying quantities, are commonly used for stocks:

Thyme	Parsley stems
Bay leaves	Cloves, whole (optional)
Peppercorns	Garlic (optional)

Onions for Flavoring

In addition to the onions in the mirepoix, an ***oignon brûlé*** (awn yohn broo lay; French for "burnt onion") is sometimes added to brown stock to give it color as well as flavor. To prepare, cut a large onion in half crosswise and place it, cut side down, on a flattop range or in a heavy skillet. Cook until the cut surface is dark brown. Add to the stock.

Another form of onion for flavoring is the ***oignon piqué*** (pee kay). This is used not so much for stocks but for soups and sauces. To prepare, stick a bay leaf to a whole, peeled onion with a whole clove. Adding the bay leaf and clove attached to the onion makes removing them easier when cooking is finished.



Oignon piqué (left) and oignon brûlé (right)

INGREDIENT PROPORTIONS

The proportions in Tables 8.2, 8.3, 8.4, and 8.5 are basic, effective, and widely used, but using them is not an ironclad rule. Nearly every chef uses some variations.

Many cooks use ratios to help them remember the basic proportions, as follows:

Bones—80 percent

Mirepoix—10 percent

Water—100 percent

INGREDIENTS FOR VEGETABLE STOCKS

Vegetable stocks, made without any animal products, play an important role in vegetarian cooking and are also used in more traditional kitchens in response to customers' requests for light, healthful dishes. The basic ingredients for vegetable stocks are vegetables, herbs and spices, water, and, sometimes, wine (Fig. 8.3).



FIGURE 8.3 Ingredients for vegetable stock.

Ingredients and proportions can vary greatly. If you want a particular flavor to predominate, use a larger quantity of that vegetable. For example, if you want a broth tasting primarily of asparagus, use a large quantity of asparagus to make it, with smaller quantities of more neutral vegetables (like onion and celery) to round out the flavor. For a more neutral, all-purpose vegetable stock, avoid strong-flavored vegetables and use more balanced proportions of ingredients.

Here are five additional guidelines for making vegetable stocks or broths:

1. Starchy vegetables, such as potatoes, sweet potatoes, and winter squash, make a stock cloudy. Use them only if clarity is not important.
2. Some vegetables, especially strong-flavored ones, are best avoided. Brussels sprouts, cauliflower, and artichokes can overwhelm a stock with a strong flavor or odor. Dark green leafy vegetables, especially spinach, develop an unpleasant flavor when cooked a long time. Beets turn a stock red.
3. Cook long enough to extract flavors but not so long that flavors are lost. Best cooking time is 30–45 minutes.
4. Sweating the vegetables in a small amount of oil before adding water gives them a mellower flavor, but this step can be omitted. Butter can be used if it is not necessary to avoid all animal products.
5. Ratios of vegetables to water may vary considerably, but the following proportions are a good starting point:

Vegetables:	4 lb	2 kg
Water:	1 gal	4 L
Sachet:	1	1

TABLE 8.2 White Stock (Chicken)

To Make:	1 Gallon	4 Liters
Bones	8 lb	4 kg
Mirepoix, standard or white	1 lb	500 g
Water	5–6 qt	5–6 L
Sachet	1	1

TABLE 8.3 White Stock (Beef and Veal)

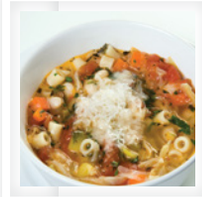
To Make:	1 Gallon	4 Liters
Bones	8 lb	4 kg
Mirepoix, standard or white	1 lb	500 g
Water	5–6 qt	5–6 L
Sachet	1	1

TABLE 8.4 Brown Stock

To Make:	1 Gallon	4 Liters
Bones	8 lb	4 kg
Mirepoix	1 lb	500 g
Tomato product	8 oz	250 g
Water	5–6 qt	5–6 L
Sachet	1	1

TABLE 8.5 Fish Stock

To Make:	1 Gallon	4 Liters
Bones	10–12 lb	5–6 kg
Mirepoix, white	1 lb	500 g
Water	1 gal	4 L
White wine	24 fl oz	750 mL
Sachet	1	1



KEY POINTS TO REVIEW

- What is mirepoix? How is it prepared?
- What is a sachet d'épices? How is it prepared?
- What are the basic proportions of bones, mirepoix, and water to make a standard white stock or brown stock?

PROCEDURES

Making stock may seem, at first glance, a simple procedure. However, many steps are involved, each with a rather complicated set of reasons. If you are to be successful at making consistently good stocks, you must understand not only what to do but also why you are doing it.

The following outlines give procedures for making basic stocks as well as the reasons for every step. After learning these procedures and checking with your instructors for any modifications or variations they may have, you will be able to turn to the individual recipes, where the steps are given again, but without explanations.

BLANCHING BONES

In Chapter 6, we discussed proteins coagulating when heated. Many proteins dissolve in cold water but solidify into small particles or into froth or scum when heated. It is these particles that make a stock cloudy. Much of the technique of stock-making involves avoiding cloudiness to produce a clear stock.

The purpose of blanching bones is to rid them of some of the impurities that cause cloudiness. The bones of young animals, especially veal and chicken, are highest in blood and other impurities that cloud and discolor stocks.

Chefs disagree on the importance of blanching. Many feel it is needed to produce clear white stocks. Others feel blanching causes valuable flavors to be lost. Fish bones, at any rate, are not blanched because of their short cooking time.

PROCEDURE for Blanching Bones

1. **Rinse the bones in cold water.**
   This washes off blood and other impurities from the surface. It is especially important if the bones are not strictly fresh.
2. **Place the bones in a stockpot or steam-jacketed kettle and cover with cold water.**
   Impurities dissolve more readily in cold water. Hot water retards extraction.
3. **Bring the water to a boil.**
   As the water heats, impurities solidify (coagulate) and rise to the surface as scum.
4. **Drain the bones and rinse them well.**
   The bones are now ready for the stockpot.

PREPARING WHITE STOCKS

A good white stock has rich, full flavor, good body, clarity, and little or no color. Chicken stocks may have a light yellow color.

PROCEDURE for Preparing White Stocks

1. **Cut the bones into pieces, 3–4 inches (8–10 cm) long.**
   This exposes more surface area and helps extraction. A meat saw is used to cut heavy veal and beef bones. Fish and chicken bones don't need to be cut, but whole carcasses should be chopped for more convenient handling.
2. **Rinse the bones in cold water. (If desired, chicken, veal, or beef bones may be blanched.)**
   This removes some impurities that cloud the stock or, if the bones are old, give an off taste.
3. **Place the bones in a stockpot or steam-jacketed kettle and add cold water to cover.**
   Starting in cold water speeds extraction (Fig. 8.4a). Starting in hot water delays it because many proteins are soluble in cold water but not in hot.
4. **Bring water to a boil, and then reduce to a simmer. Skim the scum that comes to the surface, using a skimmer or perforated spoon.**
   Skimming is important for a clear stock because the scum (which is fat and coagulated protein) will cloud the stock if it is broken up and mixed back into the liquid.
5. **Add the chopped mirepoix and the herbs and spices.**
   Remember, the size to which you cut mirepoix depends on how long it is to be cooked.
6. **Do not let the stock boil. Keep it at a low simmer.**
   Boiling makes the stock cloudy because it breaks solids into tiny particles that get mixed into the liquid.
7. **Skim the surface as often as necessary during cooking.**
8. **Keep the water level above the bones. Add more water if the stock reduces below this level.**
   Bones cooked while exposed to air will turn dark and thus darken or discolor the stock. Also, they do not release flavor into the water if the water doesn't touch them.
9. **Simmer for the recommended length of time:**

   Beef bones—8 to 10 hours
   Veal bones—6 to 8 hours
   Chicken bones—3 to 4 hours
   Fish bones—30 to 45 minutes

   Most modern chefs do not simmer stocks as long as earlier generations of chefs did. It is true that longer cooking extracts more gelatin, but gelatin isn't the only factor in a good stock. Flavors begin to break down or degenerate over time. The above times are felt to be the best for obtaining full flavor while still getting a good portion of gelatin into the stock.
10. **Skim the surface and strain off the stock through a china cap lined with several layers of cheesecloth.**
    Adding a little cold water to the stock before skimming stops the cooking and brings more fat and impurities to the surface. To keep the stock as clear as possible, ladle rather than pour the stock into the china cap to avoid stirring up sediment and other fine particles.
11. **Cool the stock as quickly as possible, as follows:**
    - Set the pot in a sink with blocks, a rack, or some other object under it. This is called **venting**. It allows cold water to flow under the pot as well as around it.
    - Run cold water into the sink, but not higher than the level of the stock, or the pot will become unsteady. An overflow pipe keeps the water level right and allows for constant circulation of cold water (see image on p. 166).
    - Stir the pot occasionally so all the stock cools evenly. Hang a ladle in the pot so you can give it a quick stir whenever you pass the sink without actually taking extra time to do it.

    Cooling stock quickly and properly is important. Improperly cooled stock can spoil in 6–8 hours because it is a good breeding ground for bacteria that cause foodborne disease and spoilage.

    Do not set the hot stock in the walk-in or, worse yet, the reach-in. All that heat and steam will overload the refrigerator and may damage other perishables as well as the equipment. Refer to food safety guidelines for cooling on page 30.
12. **Evaluate the quality of the finished stock** (p. 170).
13. **When cool, refrigerate the stock in covered containers.** Stock will keep 2–3 days if properly refrigerated. Stock can also be frozen and will keep for several months.

FIGURE 8.4 Preparing white stock.



(a) Place the bones in a stock pot and cover with cold water.



(b) Skim the scum from the surface regularly.



(c) Add white mirepoix to the pot.



(d) Add a sachet d'épices. Tying the sachet to the pot handle enables it to be retrieved whenever necessary.

Basic White Stock (Beef or Veal)

YIELD: 1 GAL (4 L)

U.S.	METRIC	INGREDIENTS
8 lb	8 kg	Beef or veal bones
5–6 qt	5–6 L	Water, cold
1 lb	500 g	Mirepoix, standard or white (p. 161)
		Sachet:
1	1	Dried bay leaf
½ tsp	2 mL	Dried thyme
½ tsp	2 mL	Peppercorns
3–4	3–4	Parsley stems
1	1	Whole clove (optional)

Per 1 fl oz (29.57 mL): Calories, 5; Protein, 0.6 g; Fat, 0.1 g (12% cal.); Cholesterol, 0 mg; Carbohydrates, 1 g; Fiber, 0 g; Sodium, 10 mg.

PROCEDURE

1. Review instructions for stock preparation (pp. 164–165).
2. If beef or veal bones are whole, cut into pieces 3–4 in. (8–10 cm) long with a meat saw. Rinse bones in cold water.
3. Blanch the bones: Place in a stockpot, cover with cold water, and bring to a boil. Drain and rinse.
4. Place the bones in the stockpot and cover with cold water. Bring to a boil, reduce heat to simmer, and skim the scum carefully.
5. Add mirepoix and sachet ingredients (tied in cheesecloth).
6. Simmer for required length of time, skimming the surface as often as necessary.

   Veal: 6–8 hours

   Beef: 8–10 hours

   Add water if necessary to keep bones covered.
7. Strain through a china cap lined with several layers of cheesecloth.
8. Cool the stock, vented, in a cold-water bath (see image below), and refrigerate.

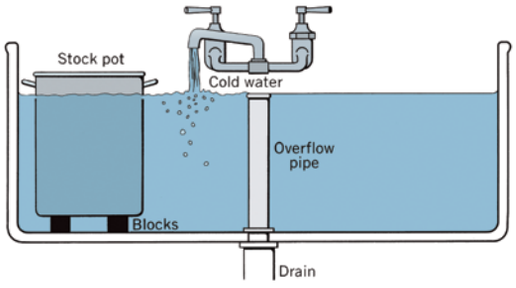
VARIATIONS

Chicken Stock

Chicken stock is usually made with a standard mirepoix, since chicken bones impart a slight yellow color of their own, so a little more color from carrots is usually not harmful. However, white mirepoix may be used, if desired. Follow procedure in basic recipe, but reduce cooking time to 3–4 hours.

White Lamb Stock, Turkey Stock, Ham Stock

Prepare according to basic procedure, substituting appropriate bones.



Setup for cooling stocks in a cold-water bath

PREPARING BROWN STOCKS

The difference between brown stocks and white stocks is that the bones and mirepoix are browned for the brown stock. This causes a few complications, as you will see. Otherwise, the procedure is essentially the same.

A second method for browning the mirepoix is given in the alternative procedure.

ROASTING BONES FOR BROWN STOCK

Brown stocks are historically fairly recent and weren't in much use until the invention of modern ovens. Earlier ovens were brick chambers heated by building fires inside them and were owned and operated by bakers, while roasting of meats was done at fireplaces. Thus, ovens weren't available for browning bones to make stock. Brown stocks as we make them today didn't really appear until the nineteenth century.

PROCEDURE for Preparing Brown Stocks

1. Cut the bones into pieces, 3–4 inches (8–10 cm) long, as for white stock. Veal and/or beef bones are used for brown stock.
2. Do not wash or blanch the bones. The moisture would hinder browning.
3. Place the bones in a roasting pan in one layer and brown in a hot oven at 375°F (190°C) or higher (Fig. 8.5a). The bones must be well browned to color the stock sufficiently. This takes over 1 hour. Some chefs prefer to oil the bones lightly before browning.
4. When the bones are well browned, remove them from the pan and place them in a stockpot. Cover with cold water and bring to a simmer.
5. Drain and reserve the fat from the roasting pan. Deglaze the pan by adding water and stirring over heat until all the brown drippings are dissolved or loosened. Add to the stockpot.
6. While the stock is getting started, place the mirepoix in the roasting pan with some of the reserved fat and brown the vegetables well in the oven.
7. Add the tomato product to the mirepoix. Continue to brown until the tomato product turns a rusty brown color. (See alternative procedure below.)
8. When the water in the stockpot comes to a simmer, skim and continue as for white stock.
9. Add the browned vegetables and the tomato product to the stockpot. If desired, they may be held out until 2–3 hours before the end of the cooking time.
10. Continue as for white stock.

FIGURE 8.5 Preparing brown stock.



(a) Roast the bones in a moderately hot oven until well browned.



(b) Place the bones in a stockpot and add the appropriate amount of water.



(c) While the bones are beginning to simmer, brown the mirepoix, using the same roasting pan set on top of the stove or in the oven. Add the browned mirepoix to the stockpot.



(d) Deglaze the roasting pan with water. Add the liquid to the stockpot.



(e) This stock has simmered slowly for 8 hours. Note the sachet is tied to the handle of the pot with twine for easy removal.



(f) Strain the stock through a china cap lined with cheesecloth.

ALTERNATIVE PROCEDURE

The mirepoix may be browned with the bones. When the bones are half browned, add the mirepoix to the pan and continue roasting until bones and vegetables are browned.

Some chefs use this method because it eliminates some steps. Others prefer to brown the mirepoix separately so it can be added to the stock later in the cooking time.

Tomato paste is the best choice of tomato product if it is browned with the mirepoix, as it contains less water. Tomato purée or canned tomatoes may also be used, but they are more likely to be added directly to the stockpot.

Basic Brown Stock ♥

YIELD: 1 GAL (4 L)

U.S.	METRIC	INGREDIENTS
8 lb	4 kg	Bones: veal or beef
5–6 qt	5–6 L	Water, cold
1 lb	500 g	Mirepoix, standard (p. 161)
2 oz	60 g	Tomato paste (see *Note*)
		Sachet:
1	1	Bay leaf
½ tsp	2 mL	Dried thyme
½ tsp	2 mL	Peppercorns
3–4	3–4	Parsley stems
1	1	Whole cloves

PROCEDURE

1. Review instructions for stock preparation (pp. 164, 167).
2. If bones are whole, cut into pieces 3–4 inches (8–10 cm) long with a meat saw. Do not wash.
3. Place bones in a roasting pan in a hot oven (400°F/200°C) and brown them well.
4. Remove bones from pan and place in a stockpot. Cover with water and bring to a simmer. Skim and let stock continue to simmer.
5. Drain and reserve the fat from the roasting pan. Deglaze the pan with water and add to stockpot.
6. Toss the mirepoix with some of the reserved fat and brown well in oven.
7. Add tomato paste to mirepoix. Continue to brown until tomato paste turns a rusty brown color.
8. Add browned mirepoix, tomato product, and sachet to the stockpot.
9. Continue to simmer for required length of time, skimming surface as necessary.

   Veal: 6–8 hours

   Beef: 8–10 hours

   Add water as needed to keep bones covered.
10. Strain through a china cap lined with several layers of cheesecloth.
11. Cool the stock, vented, in a cold-water bath, and refrigerate.

Per 1 fl oz (29.57 mL): Calories, 6; Protein, 0.5 g; Fat, 0.1 g (18% cal.); Cholesterol, 0 mg; Carbohydrates, 0.5 g; Fiber, 0 g; Sodium, 15 mg.

Note: If desired, use 1 lb (500 g) tomato purée or canned tomatoes in place of the tomato paste. Add it to the browned mirepoix and continue to brown, or add it directly to the stockpot without browning.

VARIATIONS

Brown Lamb Stock, Game Stock

Prepare according to basic procedure, substituting appropriate bones.

PREPARING FISH STOCKS

A standard fish stock is made the same way as a white stock, using the proportions given in the table on page 163. This type of stock is useful for soups and similar seafood preparations. For sauces, chefs usually prefer a more flavorful fish stock called a **fumet**. A fish fumet is made by first sweating the bones and mirepoix in fat. White wine is then added to deglaze, and finally water is added and the fumet finished in the normal manner.

Recipes for a standard fish stock and a fish fumet made with wine are given below.

Fish Stock ♥

YIELD: 1 GAL (4 L)

U.S.	METRIC	INGREDIENTS
10–12 lb	5–6 kg	Bones from lean fish
1 lb	500 g	Mirepoix, white, sliced thin or chopped fine (p. 161)
		Sachet:
1	1	Bay leaf
½ tsp	2 mL	Peppercorns
3–4	3–4	Parsley stems
½ tsp	2 mL	Dried thyme
1 gal	4 L	Water, cold
24 fl oz	750 mL	White wine (optional; see *Note*)

PROCEDURE

1. Review instructions for stock preparation (pp. 164–165).
2. Place all ingredients in a stockpot. Bring to a simmer.
3. Simmer 45 minutes, skimming as necessary to remove scum.
4. Strain through a china cap lined with several layers of cheesecloth.
5. Cool stock, vented, in a cold-water bath, and refrigerate.

Per 1 fl oz (29.57 mL): Calories, 4; Protein, 0.8 g; Fat, 0.3 g (40% cal.); Cholesterol, 0 mg; Carbohydrates, 0.2 g; Fiber, 0 g; Sodium, 2 mg.

Note: Wine is often omitted for ordinary fish stock (although it is always used in fish fumet). Alternatively, reduce the quantity of wine as desired.

Fish Fumet ♥

YIELD: 1 GAL (4 L)

U.S.	METRIC	INGREDIENTS
1 oz	30 g	Clarified butter
1 lb	500 g	Mirepoix, white, sliced thin or chopped fine (p. 161)
11 lb	5.5 kg	Bones from lean fish
24 fl oz	750 mL	White wine (dry)
		Sachet:
1	1	Bay leaf
½ tsp	2 mL	Peppercorns
3–4	3–4	Parsley stems
½ tsp	2 mL	Dried thyme
1 gal	4 L	Water, cold

PROCEDURE

1. Butter the bottom of a heavy stockpot or saucepot. Place the mirepoix in bottom of pot and the bones over top of it. Cover bones loosely with a round of brown paper or parchment.
2. Set pot over low heat and cook slowly about 5 minutes, or until bones are opaque and begin to exude juices.
3. Add the wine, bring to a simmer, and simmer 10 minutes. Then add the sachet and water to cover.
4. Bring to a simmer again, skim, and let simmer 30–45 minutes.
5. Strain through a china cap lined with several layers of cheesecloth.
6. Cool, vented, in a cold-water bath, and refrigerate.

Per 1 fl oz (29.75mL): Calories, 10; Protein, 0.8 g; Fat, 0.2 g (17% cal.); Cholesterol, 1 mg; Carbohydrates, 0.3 g; Fiber, 0 g; Sodium, 3 mg

FIGURE 8.6 Making fish fumet.



(a) Sweat the mirepoix and fish bones in butter.



(b) Add the white wine and bring to a simmer.

Vegetable Stock

YIELD: 1 GAL (4 L)

U.S.	METRIC	INGREDIENTS
1½ fl oz	45 mL	Oil
		Mirepoix:
1 lb	500 g	Onion, chopped
8 oz	250 g	Carrot, chopped
8 oz	250 g	Celery, chopped
8 oz	250 g	Leeks, chopped
4 oz	125 g	Mushrooms or mushroom trimmings, chopped
4 oz	125 g	Turnip, chopped
2 oz	60 g	Fennel, chopped
½ oz	15 g	Garlic, chopped
4 oz	125 g	Tomatoes, chopped
5 qt	5 L	Water
		Sachet:
1	1	Bay leaf
½ tsp	2 mL	Dried thyme
½ tsp	2 mL	Peppercorns
3–4	3–4	Parsley stems
2	2	Whole cloves

PROCEDURE

1. Heat oil in a stockpot over medium heat.
2. Add mirepoix, leeks, mushrooms, turnip, fennel, and garlic. Sweat for 10 minutes. Stir as necessary so vegetables do not brown.
3. Add tomatoes, water, and sachet.
4. Bring to a simmer, and simmer 45 minutes.
5. Strain and cool in a water bath.

Per 1 fl oz (29.57 mL): Calories, 2; Protein, 0.1 g; Fat, 0.1 g (27% cal.); Cholesterol, 0 mg; Carbohydrates, 0.5 g; Fiber, 0 g; Sodium, 3 mg.

VARIATIONS

Other vegetables may be used as desired.
See discussion on pages 162–163.

STANDARDS OF QUALITY FOR STOCKS

After you have finished a stock, evaluate its quality. Look for the following characteristics:

Clarity. When hot, a well-made beef, veal, or chicken stock is nearly clear, with only a slight amount of cloudiness. Fish and vegetable stocks may have slightly more cloudiness.

Color. When hot, white stocks made from beef, veal, and fish bones should be nearly colorless. Chicken stocks may have a slight golden color. Brown stocks should have a deep amber or rich golden brown color, although not as brown as canned beef broth. Vegetable stocks vary in color, depending on the vegetables used, although a neutral vegetable stock usually has a light golden color when carrots are used.

Body. When hot, well-made meat and poultry stocks have a rich mouth feel, due to their gelatin content. When chilled, they should be very thick or even gelled. Fish stocks should also have a rich mouth feel from gelatin, although the gelatin content may be somewhat less, depending on the fish used. Vegetable stocks have no gelatin content and therefore are much thinner.

Aroma and Flavor. All stocks should have a rich, full-bodied, and well-balanced flavor and aroma. Meat, poultry, and fish stocks should taste and smell mainly of their main ingredients, with no strong flavors from the mirepoix or the herbs and spices in the sachet. Brown stocks should have a richer, deeper flavor, but with no charred flavor from bones that were browned too heavily. Fish fumets should have a smooth, mellow flavor from the white wine

content, with no harsh alcohol flavors. Flavors and aromas of neutral vegetable stock should be rich and well-balanced, with no strong flavor from any single vegetable. Vegetable stocks made for specific purposes with a high proportion of a single vegetable should have the fresh flavor and aroma of that vegetable, not a strong or unpleasant flavor of overcooked vegetables.

REMOUILLAGE AND OTHER STOCK-RELATED PREPARATIONS

Remouillage (reh mwee yahzh) is a stock made from bones that were already used once to make stock. The literal meaning of the French term is "rewetting." Because not all possible flavor and gelatin is extracted from bones when making a stock, making a remouillage allows the chef to extract a little more value from the bones. The resulting liquid will not be as clear or flavorful as the original stock, but it does have some uses. A remouillage can be used for soups, for braised dishes, and in place of water for making stocks. It can also be reduced to a glaze and used for enriching sauces, soups, and braising liquids.

To make a remouillage, discard the mirepoix and herb sachet after draining a finished stock. Add fresh mirepoix and sachet to the bones, cover with fresh cold water, and simmer about 4 hours. Drain and cool as for regular stock.

Court bouillon is often discussed along with stocks. However, it is rarely used for making soups and sauces, as stocks are. Rather, it is used as a cooking medium for fish, and therefore is discussed in Chapter 21 (p. 648).

Basic Japanese stock, called ***dashi***, is quickly and easily made from only three ingredients: water; shaved, dried bonito, called ***katsuobushi*** (kaht soo oh boo shee); and a type of dried seaweed or kelp called ***kombu***. Dashi is used in soups and dipping sauces (p. 647) as well as other dishes.

Finally, broths and jus are discussed in Chapter 9 (p. 205).

Dashi ♥

YIELD: 2 QT (2 L)

U.S.	METRIC	INGREDIENTS
4½ pt	2.25 L	Water, cold
2 oz	60 g	Kombu (giant kelp for stock)
1½ oz	50 g	Katsuobushi (dried bonito flakes)

PROCEDURE

1. **Put the water in a pot and add kombu. Bring to a boil over moderately high heat.**
2. **Just as water comes to a boil, remove the kombu.**
3. **Remove from heat and immediately add bonito flakes. Let the flakes settle to bottom. This will take 1–2 minutes.**
4. **Strain through a china cap lined with cheesecloth. Use dashi within 1 day.**

Per 1 fl oz (29.57 mL): Calories, 2; Protein, 0 g; Fat, 0 g (0% cal.); Cholesterol, 0 mg; Carbohydrates, 0 g; Fiber, 0 g; Sodium, 3 mg.

Note: Instant dashi is also available. Its quality is good enough for simmered dishes and miso soup, but not for good clear soup. Follow label instructions.

VARIATIONS

Vegetarian Dashi

Omit bonito flakes and use only kombu.



FIGURE 8.7 Dashi ingredients: katsuobushi and kombu.

REDUCTIONS AND GLAZES

Stocks are concentrated by boiling or simmering them to evaporate part of the water. This is called making a **reduction**, or reducing.

Reduction is an important technique in sauce-making and in many other areas of cooking because it produces a more flavorful product by concentrating it. A reduced stock also has more body because the gelatin is concentrated.

WHAT ARE GLAZES?

A **glaze**—or, in French, ***glace*** (glahss)—is a stock reduced until it coats the back of a spoon. It is so concentrated—reduced by three-fourths or more—that it is solid and rubbery when refrigerated.

Glazes are used as flavorings in sauce-making and in some meat, poultry, fish, and vegetable preparations. Only small amounts are needed because they are so concentrated.

Glazes diluted to original strength do not taste like the stocks they were made from. The long cooking changes the flavors somewhat.

PROCEDURE for Preparing Glazes

1. Reduce the stock over moderate heat.
2. Skim the surface frequently.
3. When reduced by half to two-thirds, strain into a smaller, heavy saucepan, and continue to reduce over lower heat until the liquid is syrupy and coats a spoon.
4. Pour into containers, cool, cover, and refrigerate.
5. Glazes will keep for several weeks or longer if properly stored. They may also be frozen.



Glace de viande

KINDS OF GLAZES

1. Meat glaze, or **glace de viande** (glahss duh vee awnd)—made from brown stock.
2. Chicken glaze, or **glace de volaille** (voh lye)—made from chicken stock.
3. Fish glaze, or **glace de poisson** (pwah sohn)—made from fish stock.

CONVENIENCE BASES

The cost, both in time and materials, of making stocks in modern kitchens has led to the widespread use of concentrated convenience products known as ***bases***. These are diluted with water to make flavored liquids similar to stocks.

Glazes can be considered bases and, in fact, they are the original bases, used long before today's manufacturers started producing convenience products.

JUDGING QUALITY

Bases vary greatly in quality. The best ones are composed mainly of meat extracts. These are perishable products and must be refrigerated.

Many bases are made primarily from salt, however—an expensive way to buy salt, we might add. ***Read the list of ingredients***. Avoid products that list salt first. The best way to judge the quality of a base is to dilute it and compare its flavor to that of a well-made stock.

USING BASES

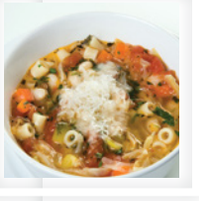
Bases can be improved with little labor by simmering the diluted or made-up product for a short time with some mirepoix, a sachet, and a few bones or meat trimmings, if possible. This helps give a fresher, more natural taste to a highly processed product.

Bases are also added to stocks to supplement them when only a small quantity of stock is on hand.

Bases are sometimes added to weak stocks to give them more flavor, but this is not as good a practice as making the stock properly in the first place.

Using bases requires taste and judgment, just as other areas of cookery do. If used without care and restraint, bases can detract from the quality of your cooking. But, used carefully, they can be a valuable tool. Always taste and evaluate as you cook.

There is no substitute for a well-made stock. But it is also true that a good base may be better than a poorly made stock. It all depends on the skills you are learning now.



KEY POINTS TO REVIEW

- What are the steps in the procedure for preparing white stock?
- How does making brown stock differ from making white stock?
- What is the best way to cool a stock?
- What is glace de viande? How is it prepared?
- How do you judge the quality of a base?

TERMS FOR REVIEW

stock
broth
mirepoix
sachet d'épices
bouquet garni
venting
fumet
remouillage
reduction
glaze
glace de viande
glace de volaille
glace de poisson

QUESTIONS FOR DISCUSSION

1. Which bones make a more gelatinous stock, beef or veal?
2. The stockpot is often considered a good way to use trimmings from meats and vegetables. Do you agree? Explain.
3. How should vegetables for mirepoix be cut?
4. Explain the importance of blanching bones before making stocks.
5. Why should stock not be boiled? Should a stockpot be covered? Why or why not?
6. Explain the procedure for cooling stock. Why is it important?
7. Why is an understanding of stocks important even if you work in an establishment that uses only bases?