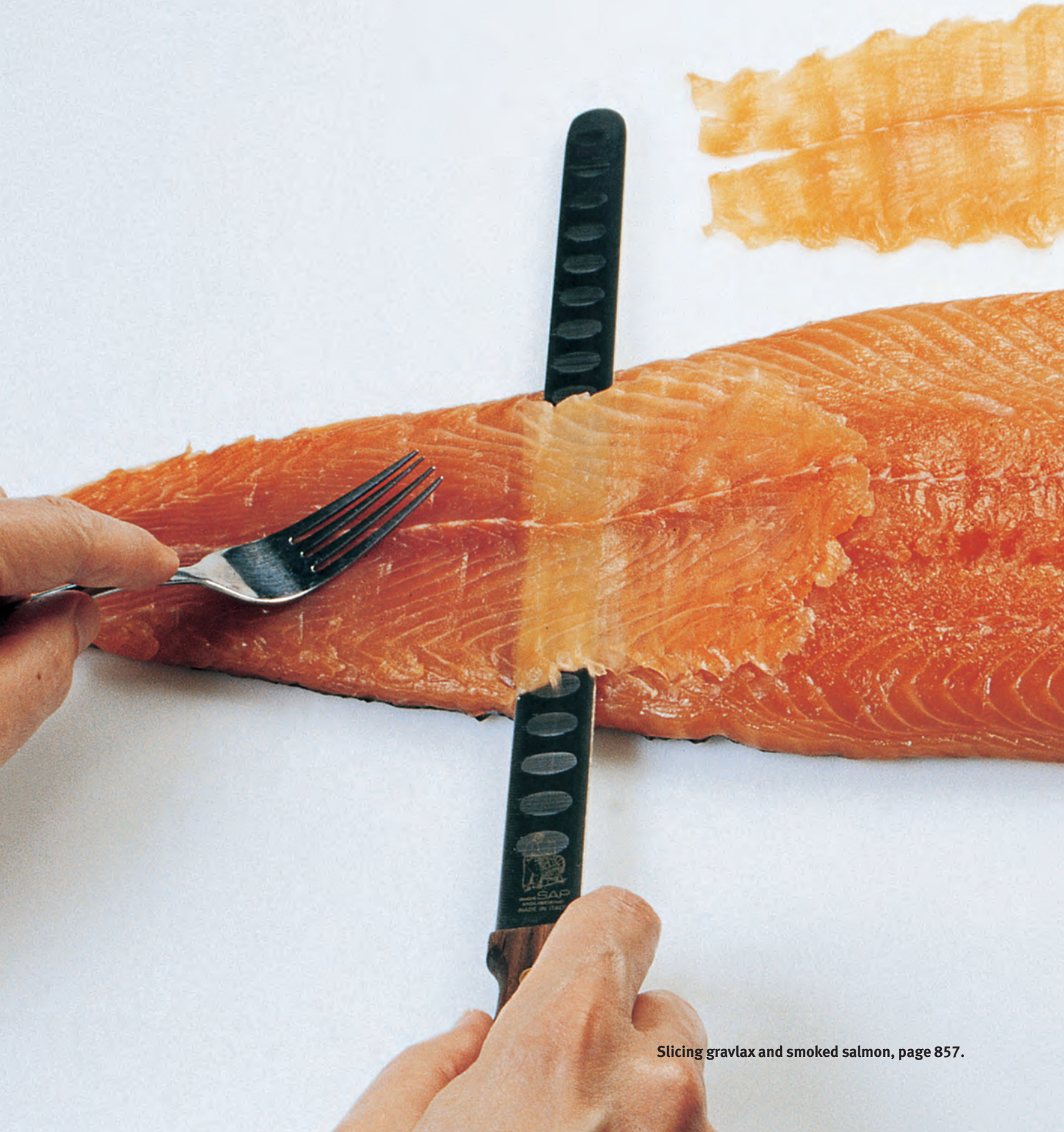


Chapter 26

FOOD SERVICE INDUSTRY SANITATION AND SAFETY TOOLS AND EQUIPMENT BASIC PRINCIPLES OF FOOD SCIENCE MANAGEMENT NUTRITION WINE EN PLATE STOCKS AND SAUCES SOUPS UNDERSTANDING PASTRY AND GAME UNDERSTANDING POULTRY AND GAME BIRDS COOKING POULTRY AND GAME BIRDS UNDERSTANDING FISH AND SHELLFISH COOKING FISH AND SHELLFISH UNDERSTANDING



Sausages and Cured Foods

Sausages have been popular since ancient times. They were first made to utilize and preserve trimmings and less desirable cuts from a meat carcass. Most people have heard the expression about using “every part of the hog except the squeal.” The preparation of sausages is an important part of this process.

The French term *charcutier* (shar koo tyay; the feminine form is *charcutière* [shar koo tyair]) means “one who prepares and sells pork products.” The art of the charcutier is called *charcuterie* (shar koo tree). We use this term more generally to refer to the production of sausages, pâtés, smoked ham, and other cured and smoked products.

The main part of this chapter is devoted to the production of fresh sausages, which are easily prepared in any kitchen with relatively simple equipment. We also introduce the subject of cured and smoked sausages with an overview of curing and smoking. Preparing smoked hams and cured, air-dried meat products is an advanced subject beyond the scope of this book. However, reading the first section of this chapter will enable you to understand how these items are produced. A small sampling of recipes gives you some experience with curing and smoking before you proceed to the main section on sausages.

After reading this chapter, you should be able to

1. Prepare simple dry-cured and brine-cured foods.
2. Prepare simple smoked foods.
3. Prepare fresh, cured, and smoked sausages.

Curing and Smoking

Curing and smoking have been important methods for preserving foods, especially protein foods, since prehistoric times. Before the days of modern preservation techniques such as canning, freezing, and refrigeration, curing and smoking, as well as drying, enabled people to store food in times of abundance for use in times of scarcity. Today we use these techniques for their contribution to flavor perhaps even more than for their preservative qualities. We smoke foods because we like the taste, not because we must in order to preserve them.

Nevertheless, it is important to understand how curing works to preserve foods so we can avoid spoilage and food-borne disease that can result from improper curing or improper handling of cured foods.

Ingredients for Curing Foods

Ingredients used in cures fill two main functions: preserving the food, and changing its flavor and texture. The following discussion of cure ingredients and processes is somewhat simplified, but it introduces the most important principles.



Clockwise from top: table salt, curing salt, kosher salt

SALT

Salt has been one of the most important food preservatives throughout most of human history. When a food comes in direct contact with salt, a two-way process takes place in an effort to make the salt concentrations inside and outside the food more nearly equal. Moisture from inside the cell walls of the food is drawn out and dilutes the salt used for the cure. At the same time, dissolved salt is absorbed into the cells to increase the salt concentration there. The result is foods that have less moisture and are saltier. Both the moisture reduction and the increased salt content make the food less hospitable to bacteria that cause spoilage and disease.

Of course, the reduced moisture and the increased salt content also change the flavor and texture of the food.

NITRITES AND NITRATES

Some foods, especially meats, are susceptible to contamination by the bacteria that cause botulism (see p. 20). Nitrites and nitrates are added to the cures for these foods to make them safe from botulism infection. *Sodium nitrite* (NaNO_2) is the most important of these chemicals. Even in the very small quantities in which it is used, sodium nitrite has strong preservative powers. In addition, it keeps meats red or pink, which is why products like cured ham, corned beef, and certain sausages have their characteristic color.

Nitrites gradually break down inside the cured foods, but by the time they lose their effectiveness, the curing and, in some cases, smoking procedures are finished, the food is cooked or refrigerated, and the food remains safe. On the other hand, when the food is raw and air-dried, as in the case of prosciutto and various salamis, a stronger chemical, *sodium nitrate* (NaNO_3) is used. Nitrates break down more slowly than nitrites and therefore are effective for a longer time. (Potassium nitrate, or saltpeter, is sometimes used in cures, but it is not as safe and is strongly regulated. It should be avoided.)

Nitrates and nitrites are the subject of controversy regarding their safety. Substances called *nitrosamines* form when foods containing nitrates or nitrites are subjected to very high heat, such as when bacon is fried. Nitrosamines are known to cause cancer. Using only nitrites to cure foods usually avoids this problem because the nitrites break down quickly and are not usually a factor when the food is cooked. Nitrates, on the other hand, because they remain in meats longer, should not be used for curing bacon for this reason.

Some people feel that all use of nitrites and nitrates should be avoided because of the nitrosamine factor. However, if only nitrites and not nitrates are used in foods that will be exposed to extreme heat, the risk is low—much lower than the risk of botulism. So far, we know of no adequate substitute for these chemicals in curing pork and other meats.

Two special mixtures are employed that make it easy to add nitrites and nitrates in very low but sufficient concentration:

1. **Prague Powder #1**, or curing salt, is a blend of 6 percent sodium nitrite and 94 percent sodium chloride, or regular table salt. It is colored pink so it will not be confused with regular salt, and thus it is often called *tinted curing mix (TCM)*. It is also sold under various trade names, such as InstaCure I.
2. **Prague Powder #2** is similar to Prague Powder #1 except that it contains nitrates in addition to nitrites. It is used in curing products that have a long curing and drying period, as explained above. Prague Powder #2 is not used in any of the recipes in this chapter.

Fish and seafood are usually cured without the use of nitrites. Fish is almost always cured under refrigeration, and the salt cure is sufficient to protect it, even when it is cold smoked (p. 856).

The quantity of nitrite to be added to meats depends on several factors, including the type of meat, the type of cure, and the length of curing time. For cooked sausage, the USDA recommends 156 parts nitrite per million parts meat. This is equivalent to 1 ounce (30 g) nitrite per 400 pounds (192 kg) meat. To translate this to quantities similar to those used in this chapter, 10 pounds (4.5 kg) cooked sausage requires about 0.025 ounces (0.7 g) nitrite. This is the amount of nitrite contained in 0.4 ounces or 2 teaspoons (11 g or 10 mL) Prague Powder #1.

Keep in mind, however, that not all the nitrite specified in a recipe may be absorbed into the meat. In the case of the basic dry cures and brine cures (described below), part of the curing medium is discarded after the cure is complete. Therefore, enough nitrite must be used so the portion that is absorbed is adequate for the cure. The only exception is the case of sausages, in which all of the curing medium is mixed directly with the meat. The recipes in this book contain appropriate quantities of nitrite to cure the product.

SUGARS

Ordinary white sugar (sucrose) and other forms of sugar, including corn syrup, honey, and maple syrup, are used in some cures. Sugars modify the flavor of the food and counteract some of the harsh flavor of the highly concentrated salt in the cure. Also, because salt extracts so much moisture, sugar adds to the perception of moistness in the cured product. Using less sweet forms of sugar, such as corn syrup and dextrose, provides the advantages of sugar without adding too much sweetness.

HERBS, SPICES, AND OTHER FLAVORINGS

Nearly any spice or flavoring that can be used in cooking can be used in curing. Traditional recipes, of course, use traditional seasonings. Most of our most familiar cured sausages, for example, are of European origin and use such seasonings as garlic, pepper, coriander, caraway, nutmeg, and dry mustard. Many chefs today are experimenting with unusual ingredients to give a modern accent to cured meats, poultry, fish, and sausages.

Curing Methods

The two basic types of cure are *dry cures* and *brine cures*. With both of these methods, the food item remains in contact with the curing mixture, which contains salt plus any of the other ingredients discussed above, until the curing medium has penetrated the food uniformly. The difference between the methods is that in brines, the salt is dissolved in water, whereas in dry cures, it is not.

DRY CURES

In a dry cure, the cure ingredients (salt, plus seasonings and, in many cases, sugar and Prague Powder) are mixed together and packed or rubbed over the food product to coat it completely. The length of time required to dry-cure meats depends on their thickness. Lean meat 1 inch (2.5 cm) thick requires 3 to 8 hours, while a whole ham needs about 45 days. During a long cure, the food is repeatedly turned and rubbed with the cure mixture in order to maintain uniform contact. It is important that the entire surface area be coated.

The curing procedure for sausages could be considered a dry cure. However, in this case, the cure is mixed directly with the meat. Because no time is required for the cure to penetrate to the center of the meat, the curing process takes place quickly, although the products may be air-dried or smoked for a longer period before being consumed.

BRINE CURES

A brine is a solution of salt and other curing ingredients in water. The simplest way to use a brine is to immerse the meat in the brine and let it soak until the cure is complete. Compared with dry cures, brines are especially useful for poultry items, which are difficult to coat evenly with a dry cure because of their shape. Items that float, such as poultry, must be held down with a weight so they are completely submerged in the brine.

Simple brine soaking is used for small meat items, but because the brine takes time to penetrate to the center of large items such as hams, another method is used to speed the process. Brine is pumped or injected into the meat to make sure it penetrates evenly. After injection, the meat may be soaked in brine as well. Commercial operations use a variety of high-speed equipment for injecting brine. In addition, small pumps are available for brining by hand.

The length of time required for brining depends on the size and thickness of the item. Of course, meats injected with brine need less time in the brine soak.

Fresh brine should be made for each batch of cured meats. Do not reuse brines because they are diluted and contaminated with juices from the first batch of meats.

Smoking

Smoking has been used as a way of drying and preserving foods since prehistoric times. Smoking does have some preservative effects but, for modern cooking, it is more important for the flavors it gives to meats, poultry, and seafood. Even smoked cheeses and vegetables are enjoyed for their special flavors.

The first rule of smoking foods is *do not smoke meats, poultry, and fish that have not been cured*. The reason is a matter of food safety. During smoking, foods spend time in the Food Danger Zone (p. 18)—that is, at a temperature favorable for the growth of bacteria. Without the preservative effects of curing, smoking could be unsafe. (This rule does not apply to *smoke roasting* and *barbecuing* [p. 73], which are more properly considered cooking methods rather than smoking methods because they take place at higher temperatures.)

After meats, poultry, and fish are cured, they should be allowed to dry slightly before being smoked. So air can circulate all around the foods, place them on racks or hang them from hooks under refrigeration until the surface is dry to the touch. This preliminary drying allows the smoke to penetrate the foods more effectively.

The two basic types of smoking are *cold smoking* and *hot smoking*. In cold smoking, the temperature inside the smokehouse is kept at or below 85°F (30°C). At these temperatures, the foods take on the flavor of the smoke but are not cooked.

In hot smoking, the temperature inside the smokehouse may be as high as 165°F (74°C) for sausage and meats, and as high as 200°F (93°F) for fish and poultry. These temperatures are high enough to cook the foods being smoked. Higher temperatures are usually avoided because they result in excessive shrinkage. Foods may be hot smoked until they reach an internal temperature of 150° to 165°F (65° to 74°C) to ensure they are fully cooked. Alternatively, they may be hot smoked for a shorter period and then poached until they reach this internal temperature. This second method is used when a less intense smoke flavor is desired. No matter which method is used, hot-smoked foods are always sold fully cooked.

A typical smoker consists of the following elements:

- An enclosed chamber for holding the foods to be smoked
- A source of smoke
- A means to circulate the smoke around the food and then to exhaust it
- A way of controlling the temperature inside the chamber

The smoke source consists of a receptacle for wood chips or sawdust plus a heating element, usually electric. If the smoker is to be used for cold smoking, the smoke generator

should be outside the main chamber that holds the food. If the smoke generator is inside the food chamber, as in some less expensive smokers, the temperature will rise too high for cold smoking. This type of smoker is used only for hot smoking. Foods to be smoked are arranged on racks or hung from hangers with enough space between them so the smoke circulates freely around all surfaces. Commercially made smokers are safest to use, as improperly built smokers may present a fire hazard. If a smoker is used indoors, it is essential to provide for ventilation of the exhausted smoke to the outdoors.

Hickory is perhaps the most popular wood for smoking, but other hardwoods that may be used include oak, mesquite, and fruitwoods such as apple and cherry. Soft woods, like pine, are not used because they release bitter, tarry components when burned. It is important to use woods from a reliable source. Pressure-treated woods should never be used, as they contain toxic chemicals such as arsenic.

To summarize, the smoking process consists of the following steps:

1. Curing (dry cure or brine cure)
2. Air-drying
3. Smoking (hot smoking or cold smoking)

KEY POINTS TO REVIEW

- What are the main ingredients used in curing? What is the purpose of each of them?
- What are the two main types of cures?
- Should foods be cured before being smoked? Why or why not?
- What are the two basic kinds of smoking processes? Describe them.

Gravlax

YIELD: 1 LB 14 OZ (850 G) WITHOUT SKIN

U. S.	METRIC	INGREDIENTS
2½ lb	1.2 kg	Salmon fillet, skin on
4 oz	125 g	Coarse salt
4 oz	125 g	Sugar
¼ tsp	1 mL	White pepper
2 oz	60 g	Fresh dill sprigs

Per 1 ounce (28.35 g): Calories, 70; Protein, 8 g; Fat, 4 g (50% cal.); Cholesterol, 20 mg; Carbohydrates, 1 g; Fiber, 0 g; Sodium, 240 mg.

PROCEDURE

1. Pass your fingertips over the surface of the salmon fillet to locate any bones. Pull them out with needlenose pliers.
2. Mix the salt, sugar, and pepper.
3. Select a stainless-steel, glass, ceramic, or other nonreactive pan to hold the salmon for curing. Sprinkle a little of the salt mixture on the bottom of the pan and lay the salmon on it skin side down. Cover the flesh side of the fillet completely with a layer of the salt mixture. Then top with the dill, again covering the fillet completely.
4. If you are doubling this recipe and curing 2 fillets, salt the second fillet in the same manner and invert it on top of the first so the dill is sandwiched between the fillets and the skin side of each fillet is toward the outside.
5. Cover the pan well and refrigerate 1 day. Turn the fillet or fillets over and refrigerate another day (for a total of 2 days). *Note:* Some instructions say to place a weight on the fish during the cure. This is optional. Weighting the fish produces a slightly drier, firmer finished product.
6. After 2 days, drain off any liquid that accumulated in the pan. Carefully scrape all the dill and curing mixture from the fish.
7. To serve, cut on a sharp diagonal—that is, with the knife almost parallel to the table—into broad, paper-thin slices (Figure 26.1).



Figure 26.1 Slice gravlax and smoked salmon on the diagonal into paper-thin slices. Cut toward the tail end.

Smoked Salmon

YIELD: 1 LB 14 OZ (850 G) WITHOUT SKIN

U.S.	METRIC	INGREDIENTS
2½ lb	1.2 kg	Salmon fillet, skin on
6 oz	180 g	Coarse salt
3 oz	90 g	Sugar
2 tsp	10 mL	Coarse black pepper
1 tsp	5 mL	Dry mustard
½ tsp	2 mL	Ground allspice
¼ tsp	1 mL	Cayenne
2 oz	60 g	Onion, chopped fine

Per 1 ounce (28.35 g): Calories, 70; Protein, 8 g; Fat, 4 g (53% cal.); Cholesterol, 25 mg; Carbohydrates, 0 g; Fiber, 0 g; Sodium, 240 mg.

PROCEDURE

1. Pass your fingertips over the surface of the salmon fillet to locate any bones. Pull them out with needlenose pliers.
2. Mix the salt, sugar, pepper, dry mustard, allspice, and cayenne.
3. Select a stainless-steel, glass, ceramic, or other nonreactive pan to hold the salmon for curing. Sprinkle a little of the salt mixture on the bottom of the pan and lay the salmon on it skin side down. Cover the flesh side of the fillet completely with a layer of the salt mixture. Then top with the chopped onion, distributing it evenly over the fillet.
4. If you are doubling this recipe and curing 2 fillets, salt the second fillet in the same manner and invert it on top of the first so the onion is sandwiched between the fillets and the skin side of each fillet is toward the outside.
5. Cover the pan well and refrigerate 12–24 hours.
6. Remove the fillet from the pan and rinse off all the salt mixture and onion. Place on a rack set on a sheet pan, skin side down, and allow to dry, uncovered, in the refrigerator until a thin, dry skin (called a *pellicle*) has formed on the surface of the flesh.
7. Cold smoke at 86°F (30°C).
8. To serve, cut on a sharp diagonal—that is, with the knife almost parallel to the table—into broad, paper-thin slices.

Smoked Trout

YIELD: 10 FILLETS, 6–7 OZ (180–200 G) EACH

U.S.	METRIC	INGREDIENTS
2 qt	2 L	Water
8 oz	250 g	Salt
2 oz	60 g	Light brown sugar
4	4	Bay leaves
2 tsp	10 mL	Black peppercorns
1 tsp	5 mL	Coriander seed
½ tsp	2 mL	Whole allspice
½ tsp	2 mL	Dry mustard
10	10	Trout fillets, about 8 oz (250 g) each

Per fillet: Calories, 320; Protein, 47 g; Fat, 12 g (36% cal.); Cholesterol, 135 mg; Carbohydrates, 2 g; Fiber, 0 g; Sodium, 3420 mg.

PROCEDURE

1. Prepare the brine: Combine the water, salt, sugar, bay leaves, peppercorns, coriander, allspice, and mustard in a pot. Bring to a simmer, stirring until the salt and sugar are dissolved.
2. Cool, then chill the brine.
3. Place the trout fillets in a stainless-steel, plastic, or other nonreactive pan in a single layer. Add enough cold brine to completely cover the fillets. Place a light weight on top of the fish to keep them submerged.
4. Refrigerate 6–8 hours.
5. Remove from the brine and rinse in cold water. Blot dry.
6. Arrange on racks and allow to dry several hours in the refrigerator.
7. Hot smoke at 185°F (85°C) until the internal temperature of the fish reaches 145°F (63°C), about 1–1½ hours. Cool, then refrigerate.

Smoked Duck

YIELD: 2 SMOKED DUCKS

U. S.	METRIC	INGREDIENTS	PROCEDURE
1½ gal	6 L	Water	<ol style="list-style-type: none"> 1. Prepare the brine: Heat the water in a pot until it is warm. Add the salt, sugar, and Prague Powder and stir until they are dissolved. Add the bay leaves and onion powder. 2. Cool, then chill the brine. 3. Place the ducks in a stainless-steel, plastic, or other nonreactive container. Pour enough brine over them to cover them completely. Weight them to keep them submerged. 4. Allow to cure in the refrigerator 2 days. (<i>Note:</i> Large ducks take 3–4 days to cure.) 5. Remove the ducks from the brine and rinse well. 6. Place on a rack and let dry in the refrigerator at least 8 hours. 7. Hot smoke at 185° (85°C) until the internal temperature of the duck reaches 165°F (74°F).
12 oz	360 g	Salt	
6 oz	180 g	Sugar	
3 oz	90 g	Prague Powder #1	
3	3	Bay leaves	
2 tsp	10 mL	Onion powder	
2	2	Small ducks, about 4 lb (1.8 kg) each	

Per 1 duck, without skin: Calories, 510; Protein, 79 g; Fat, 17 g (32% cal.); Cholesterol, 305 mg; Carbohydrates, 4 g; Fiber, 0 g; Sodium, 4330 mg.

VARIATIONS

Smoked Turkey or Chicken

Brine turkey or chicken as in the basic recipe. Turkey requires 4–6 days to cure in the brine, depending on the size. Chickens require 2–4 days, depending on their size.

Sausages

A **sausage** is a mixture of ground meat, usually pork, and seasonings stuffed into a casing. The term *sausage* may also be used for the meat mixture itself, without the casing. Reduced to its simplest form, sausage meat may be nothing more than ground pork seasoned with salt.

Although there are hundreds or even thousands of kinds of sausages, the majority are based on the same few basic principles. These principles are simple enough that we can make a wide variety of sausages in the kitchen and not have to rely entirely on commercial products. Furthermore, it is not necessary to restrict ourselves to traditional sausage recipes. Many chefs are experimenting with ingredients and seasonings to add variety to the menu.

Categories of Sausages

Sausages can be classified into three basic groups:

Fresh sausages

Cured sausages

Smoked sausages

A **fresh sausage**, by USDA definition, is one that contains no nitrates or nitrites. It is basically a mixture of ground meat, seasonings, and flavorings. Although they are often raw, fresh sausages may contain cooked ingredients, or they may even be fully cooked before being sold. Any fresh raw sausage containing pork, of course, must be fully cooked before being served and eaten.

A **cured sausage** is one that contains nitrites or nitrates of sodium. These chemicals help prevent spoilage and food-borne disease, as explained in the first part of this chapter. Incidentally, they also keep the meat red or pink, even when cooked. Cured sausages may be sold raw or cooked, soft and moist like fresh sausages, semidried and firm, or dried and hard like salami. Pork salamis, which are Italian in origin, and similar cured, dried sausages are

raw, but the curing, aging, and drying process renders them safe to eat. As explained on page 854, air-dried sausages meant to be eaten raw are made with nitrates in addition to nitrites for a longer lasting cure.

Smoked sausages may be hot smoked and, therefore, cooked, or cold smoked. Smoking may be light or heavy, depending on the sausage. Sausages, like other smoked meats, are cured before being smoked. The cure mixture is mixed directly with the sausage meat.

Basic Sausage Ingredients

The basic ingredients of sausage meat are the following:

- Lean pork
- Pork fat, preferably hard fatback, ground with the meat
- Salt
- Spices, herbs, and other seasonings and flavorings

In the case of cured sausage, curing mixes containing nitrites or nitrates are added to the above list.

THE MEAT

Pork is the most commonly used meat in sausage making, but other meats or mixtures of meat may be used. Beef, veal, lamb, chicken, turkey, duck, liver, rabbit, and venison all find their way into sausages. Mixtures of pork plus one or more of these meats are often used. More exotic sausages may include such ingredients as sweetbreads and brains.

Certified pork—that is, pork certified to be free of trichinosis—is used for sausages meant to be air-dried and eaten uncooked.

THE FAT

Pork fat or other fat, such as the beef fat used in all-beef sausages, is an important ingredient. Because our impression of juiciness in any cooked meat is largely due to the meat's fat content, some fat is included in sausage mixtures. Without it, the texture of the cooked sausage would be very dry.

In most traditional sausages, fat makes up 25 to 50 percent of the total weight, with 33 percent fat being the norm. In other words, proportions of fat to lean range from 3 parts lean plus 1 part fat (the leanest sausages) to 1 part lean plus 1 part fat (rich, fatty sausages). Varying the proportions changes the character of the sausage.

Hard fatback is preferred over other fats for pork sausage. Softer fats are more likely to melt out of the sausage during cooking. A quick and easy way to make pork sausages without worrying about the ratio of fat to lean is to use whole pork butt. The ratio of fat to lean in this cut is very good for sausages.

In today's diet-conscious atmosphere, it may make sense to try to create low-fat sausages. But be advised that extra care is required when making sausages with less than 25 percent fat. Lean sausages should never be overcooked, as overcooking makes them dry. Keep the meat mixture cold to avoid damage to the texture of the meat and fat. With care, it is possible to make tasty sausages with a fat content as low as 10 or 15 percent. One should not expect, however, that the eating qualities of lean sausages will be the same as those of fattier sausages.

Cereal ingredients and fillers (rice, barley, bread crumbs, and so on) can be used to help reduce fat content. Because these starches absorb and retain moisture, they enhance the total moisture content of low-fat sausages.

SEASONINGS

Herbs, spices, and other flavorings account for the primary differences among sausages. Many, if not most, of the world's fresh sausages are made of nothing more than ground pork and seasonings. It is the seasonings that give them their characteristic flavor. A glance at the recipes in this section will confirm this.

Some of the major spices and herbs used in sausage making are:

Allspice	Cumin	Paprika
Caraway seeds	Fennel seed	Parsley
Cayenne or hot red pepper	Ginger	Pepper, black and white
Cinnamon	Mace	Sage
Cloves	Marjoram	Tarragon
Coriander	Mustard	Thyme
	Nutmeg	

Other important ingredients include:

Garlic	Chives	Vinegar
Onion	Wine, white and red	Eggs
Shallots		

Standardized spice mixtures are often used to season sausages, pâtés, and similar items. One of the most common is *quatre épices* (French for “four spices”), a mixture that exists in many versions. It can usually be obtained commercially, or it can be homemade, using recipes such as those on page 867.

CURE MIXES

Sausages to be air-dried are cured with both nitrate and nitrite, as explained on page 854. For other cured sausages, only nitrite, usually in the form of Prague Powder #1, is used. Other ingredients, such as dextrose and additional salt, may be combined with the Prague Powder to make the cure mix. The cure mix may be incorporated into the sausage in one of two ways:

1. It may be mixed with the meat after it is diced. The diced meat is then chilled thoroughly before being ground.
2. It may be combined with the remaining spices and seasonings and mixed into the ground meat.

Refer to individual recipes for more detailed instructions on making and incorporating cure mixes.

OTHER INGREDIENTS

A number of sausages are characterized by unusual or exotic ingredients. Some of these are traditional and time-honored, such as the black truffles included in some regional French sausages and the chestnuts or raisins in other specialty sausages.

Other unusual sausages are modern innovations by creative chefs. It is no longer uncommon, when reading today’s restaurant menus, to come across sausages with such ingredients as sun-dried tomatoes or fresh vegetables like sweet bell peppers and spinach. In theory, there is no limit to what can be stuffed into sausage casings. The main requirement is that the ingredients complement or enhance one another, just as the meat, seasonings, and vegetable garnish on a dinner plate should complement one another.

Casings

Natural casings are made from the intestines of meat animals. *Sheep casings* are the smallest, ranging from $\frac{3}{4}$ inch (18 mm) to more than 1 inch (25 mm) in diameter. They are used for breakfast links, frankfurters, and similar sausages. *Hog casings* are medium-sized, about 1 to $1\frac{1}{2}$ inches (3 to 4 cm) in diameter, depending on what part of the intestines they are taken from. They are used for many popular fresh sausages, such as Italian sausages and fresh bratwurst. *Beef casings* range in size from the so-called *beef round*, about $1\frac{1}{4}$ inches (45 mm) in diameter, through *beef middles*, $2\frac{1}{2}$ inches (63 mm), to the large *beef bung*, more than 4 inches (100 mm) in diameter.

Natural casings are often sold packed in salt. Because of the preservative effect of the salt, the casings keep indefinitely as long as they are refrigerated. Natural casings are easy to use if they are handled correctly. Before being stuffed, they must be untangled, rinsed, and flushed, and examined for holes according to the following procedure.

Procedure for Preparing Natural Casings

1. Carefully remove the casings, one at a time, from the salt pack, and unravel them. Because a single casing may be 12 feet (4 m) long, it is easiest to do this on a large workbench. Separate the individual lengths and keep them separate in their own little stacks on the bench. When unraveling them, do not pull hard, because this may cause knotting.

Unravel slightly more casing than you think you will need. It is easier to return unused casings to the salt pack than it is to separate and flush additional casings when you run out before you have stuffed your whole batch of meat.

2. Partially fill a large bowl with clean water and set it in a sink under the faucet. Take hold of the end of one casing and drop the rest of it into the bowl of water. Open the end of the casing and run cold water into it, enough to fill about 12 inches (30 cm) of it. Holding the casing at both ends of this “water sausage,” allow the water to flush through the casing from one end to the other.

This accomplishes two purposes. It rinses out the inside of the casing, and it identifies any holes that might be present. Pinpoint-size holes are no problem, but if a large hole is found, simply cut the casing in two at that point. Short pieces may be discarded for the sake of efficiency.

3. If you are making a small quantity of sausages and stuffing them immediately, each casing can be put on the stuffing horn as it is rinsed. If this is not the case, the casing must be stored for later use. Select a container with a cover and fill it about three-fourths full of cold water. Drop in the casing and let one end hang over the edge.

Repeat with remaining casings. Fill the container to the top with cold water, cover, and refrigerate until needed. By letting the ends of the casings hang over the edge, you can remove one at a time from the container without tangling them. If the end of the casing dries out, simply cut it off.

Because the supply of natural casings is not nearly large enough to accommodate all the sausages produced, other types of casings have come into wide use. *Collagen casings* are molded from animal materials and are completely edible, like natural casings. Unlike natural casings, they are uniform in size, making portion control easier. Various types are manufactured for different uses. Some are used only for fresh sausages, as they are not strong enough to hold the weight of the sausages if they are hung for smoking. Other types are stronger and intended to be used for smoked sausages. Most collagen casings must be refrigerated to keep them from becoming dry and brittle. To use, dip them in water for a few seconds to soften them if they are dry, then put them on the sausage stuffing nozzle.

Synthetic fibrous casings are made from a plastic material and are not edible. They are widely used for salamis and luncheon meats, and the casing is peeled off before or after slicing. These casings are nonperishable and need no refrigeration. They must be soaked in water before using to make them flexible. Soaking time varies, and the manufacturer should specify the recommended time.

Equipment

Most fresh sausages can be made with no special equipment other than a meat grinder and a device for getting the meat into the casings.

The working parts of a meat grinder are a rotating blade and a selection of dies in various sizes. The size of the die determines the fineness of the grind. A screw forces the meat from

the feed tube to the blade, and the blade chops the meat as it is forced through the holes of the die.

Before grinding meat, it is important to be sure of the following two points:

1. The equipment must be clean and sanitary. Make sure there is no trace of food from previous jobs hiding in the many nooks and crannies of the grinder, blades, and dies.
2. The equipment must be cold in order to avoid warming the meat. Refrigerate the grinder parts or set them in ice water before use.

The sausage stuffer is the second piece of equipment necessary for making sausages. The simplest stuffer resembles a funnel. The casings are pushed over the narrow end and the meat is pushed through the wide end by hand or with a wooden plunger. These are adequate for making a few pounds of sausage but are not suitable for larger batches.

Larger stuffers have detachable nozzles or horns for different casing sizes. The nozzle is attached to a cylindrical reservoir that holds the meat, which is pushed through by a piston. On smaller machines, the piston is simply pushed through by hand. These machines are suitable for small-scale production such as might be done in a small to medium-size restaurant. For large-scale commercial production, larger machines are used. The piston in a large machine is operated by means of a crank and a sequence of gears.

The Grind

The grind of the meat determines the texture of the sausage. We can divide sausage meat into two categories based on grind. Most common sausages are made simply of meat and fat ground to varying degrees of fineness or coarseness, mixed with seasonings, and stuffed into casings. We refer to these as *basic grind* sausages. Some sausages, on the other hand, including familiar ones like frankfurters, mortadella, and bologna, are made with meat and fat ground to a smooth purée and blended with a little liquid, such as water or milk. We refer to these as *emulsified* or *emulsion grind* sausages because of the added liquid content and the emulsion of the fat with the meat and liquid.

BASIC GRIND

The fineness or coarseness of the grind is an important characteristic of any sausage. For example, one identifying feature of Toulouse Sausages (p. 867) is their coarse texture. The meat is chopped by hand rather than ground. On the other hand, typical breakfast sausages have a fairly fine grind.

To grind meat, cut it into pieces small enough to fit easily into the feed tube of the grinder, then chill it well. For the best texture, start with the largest die, no matter what final grind is needed. Then grind with the next smaller die, until the desired texture is achieved. This process is called *progressive grinding*. Control the coarseness of the grind by selecting the proper die for the final grind, as indicated in the recipe. As indicated in the procedure below, the meat, fat, and seasonings are mixed until uniformly blended after the meat is ground.

The meat mixture must be kept cold during grinding. When the mixture gets too warm, the fat becomes soft and begins to lose its structure. As a result, it may melt out too readily when the sausage is cooked, resulting in excessive shrinkage, poor texture, and dryness. If the kitchen is warm, return the meat to the refrigerator to chill it thoroughly after cutting it up and before grinding it. If it must be ground more than once, return it to the refrigerator between grindings.

Additional textural variation in basic grind sausages can be created by mixing chunks or dice of meat or other ingredients into a more finely ground forcemeat, as is often done in pâtés.

When following any sausage recipe, adhere closely to the grinding and processing directions in order to achieve the proper texture and character.

Procedure for Making Fresh and Cured Basic Grind Sausages

1. Weigh the meats and fat. Cut them into chunks small enough to fit into the grinder.
2. If the sausages are to be cured, toss the cure mix with the diced meat at this point. Alternatively, combine the cure mix with the salt and spices in step 4.
3. Chill the meat well before proceeding.
4. Measure the salt and spices.
5. Grind the meat and fat, following the directions in the recipe to achieve the proper fineness or coarseness of grind.
6. Chill the meat well. Ideally, the meat should be chilled to 32° to 35°F (0° to 2°C) before mixing and stuffing. Best practice is to grind the meat directly into a bowl set in an ice bath.
7. Combine the meat, salt, and spices and mix thoroughly. This is best done by hand in a large tub or other container. It can also be done with a mixing machine using the paddle attachment.

If the recipe calls for cold water or other liquid, mix the salt and spices with the water first, then mix this combination with the meat. This facilitates a better distribution of the spices than mixing them dry with the meat.

Many recipes say to refrigerate the meat overnight after it is mixed to allow it to absorb the seasonings and the flavors to blend. However, it is easier to stuff the sausages immediately after mixing. If the salted meat mixture is allowed to stand, it becomes firmer and thus harder to force through the stuffer. Stuffing immediately allows the casings to be filled more uniformly and with fewer air bubbles. Besides, the meat can absorb the seasonings just as well in the casings as in the meat tub.
8. Test for seasonings. Do not taste the raw meat. Rather, make a small ball or patty and cook it in a small sauté pan or poach it in water. Then cool the meat slightly and taste. If more salt or other seasoning is needed, add it to the sausage mixture.
9. Place the meat in the stuffer, one handful at a time. Pack each handful firmly into the stuffer to eliminate air bubbles.
10. Slide the casings onto the nozzle. To help the casings slide on easily, moisten both them and the stuffer nozzle with water.
11. Stuff the sausages, following the directions for your equipment (see Figure 26.2). The sausages will pull the casings off the nozzle as the meat flows through it, but it is best to hold your hand at the end of the nozzle to help control the rate at which the casing is pulled from the nozzle. From time to time, as the casing is filled, it is necessary to push the bunched-up, unfilled casing toward the end of the nozzle so it will slide off more easily. Do not stuff the casings too tightly. If the meat is packed too tightly, it will be difficult to twist the sausage into links.
12. After all the meat is stuffed into casings, remove any air bubbles by pricking the casing and pressing the surface to expel the air.
13. Twist the sausage into links of uniform size.

Figure 26.2 Stuffing sausages.



(a) A small sausage stuffer fitted with a medium nozzle. This stuffer holds 5 lb (2.3 kg) of meat at a time.



(b) Flush out the casings with fresh, cold water, while looking for holes.



(c) Slide the casings onto the proper size nozzle.



(d) When stuffing the casings, use one hand to guide the casing as it slides off the nozzle.



(e) Pinch and twist the sausage into links of the desired size.

EMULSIFIED GRIND

In the finest-textured sausages, the meat is actually puréed to a smooth paste. Puréed raw meat is capable of absorbing a good deal of moisture, and water or milk is usually added to improve the texture. Because of the addition of liquid to the meat purée, the resulting grind is called an *emulsified grind*. For sausages that include milk, a recipe may indicate either liquid milk or water plus dried milk solids. The dried milk is added at the same time as the spice mixture.

Because grinding meat to a smooth paste generates heat, water is added in the form of ice to keep the temperature low. If liquid milk is called for, freeze it into chunks.

Because a meat grinder is not capable of grinding sausage to this texture, the grinding procedure is done in two stages. First, grind the meat and fat separately using the fine die on the meat grinder. Keep the two separate and chill them after this grinding. Second, grind the meat to a smooth paste with a food chopper (buffalo chopper) or food processor. Place the lean meat in the bowl of the chopper and run it a few seconds. Then add the ice and continue to grind until smooth. Monitor the temperature carefully. Do not allow it to rise above 50°F (10°C). Add the fat and continue to grind to blend it in. Continue to monitor the temperature. Do not allow it to rise above 58°F (14°C).

Emulsified sausages are usually cooked in water after stuffing, then chilled in cold water. If they are to be smoked, they are smoked first and then cooked.

Procedure for Making Fresh and Cured Emulsified Sausages

1. Keeping the meat and fat separate, grind them with the fine die of a meat grinder, following steps 1 through 6 of the basic sausage-making procedure above. Chill well.
2. If indicated in the recipe, mix the seasonings with the lean meat. (Alternatively, add the seasonings at the same time as the ice in step 3.)
3. Place the lean meat in the bowl of a food chopper or food processor. Run the chopper a few turns, then add the ice. Continue to chop to a fine paste. Do not allow the temperature to rise above 50°F (10°C).
4. Add the fat and continue to grind to blend it in. Continue to monitor the temperature. Do not allow it to rise above 58°F (14°C).
5. Follow steps 8 through 12 in the procedure on page 864 to test the seasonings and stuff the casings.

Smoking Sausages

The procedure for smoking sausages is the same as for smoking other meats (see Figure 26.3). Refer to page 856 for basic information on smoking and follow the instructions in individual recipes. Note in particular the following points:

1. Only cured sausages should be smoked.
2. The sausages should be dried briefly before being smoked, like other smoked foods (see p. 856). Hang them so that air can circulate around them and allow to dry about 1½ hours or as indicated in the recipe.
3. Hot smoke or cold smoke as indicated in the recipe. Air-dried sausages to be eaten raw are cold smoked. Sausages that are sold cooked are generally hot smoked. After smoking, they are usually poached to an internal temperature of 160° to 165°F (71° to 74°C), then cooled quickly in ice water and blotted dry.

Cooking Sausages

Although sausages are sometimes ingredients or components of more elaborate dishes, they are also popular as standalone menu items like other meats. Preparation of sausages before cooking is minimal. In most cases, sausages may be considered ready to cook—or, in the case of fully cooked sausages, ready to heat. Fresh raw sausages containing pork must be fully cooked before serving, like other fresh pork products. If a fresh sausage contains no pork, such as the lamb sausage on page 869, it may be served somewhat less done. Removing it from the heat when still pink inside helps retain juices.

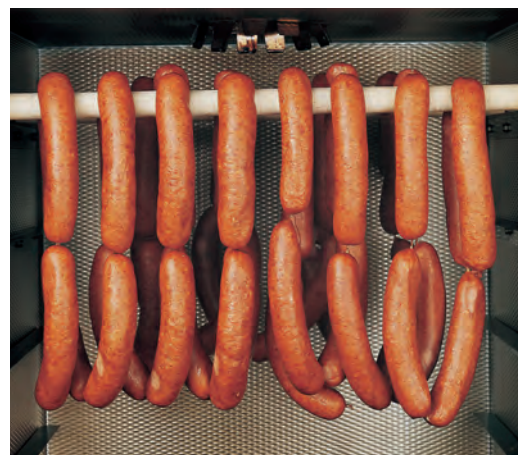


Figure 26.3 Finished sausages before removing from the smoker

Fully cooked sausages need only be heated through before serving. Cooking times, however, are nearly the same as for raw sausages. In other words, the time it takes for the heat to penetrate to the center is about the same.

The following cooking methods are most often used for sausages.

SIMMERING

Place sausages in a pan with enough salted water to cover. Bring to a simmer and simmer until completely cooked. Do not let the water boil. This is likely to make the sausages burst or shrink excessively.

Time depends on the thickness of the sausage. Sausages in hog casings take about 20 minutes to cook; smaller ones may take as little as 10 minutes, larger ones 30 minutes or more.

Raw sausages may be simmered until cooked through, then finished by one of the following methods.

SAUTÉING AND PAN-FRYING

Sausages are sautéed or pan-fried using the same techniques as for other meats. For many kinds of sausage, the browning that results makes them more appetizing than simmered ones.

If the sausages are not raw, it is necessary only to cook them until they are lightly browned and heated through. If they are raw, lower heat is necessary so they have time to become completely cooked by the time they are browned.

Sautéing and pan-frying are used not only for sausages in casings but also for patties and *crêpinettes*, which are sausage patties wrapped in caul fat (see p. 867). Do not press on the patties with the spatula while cooking. This forces out juices and makes them dry.

BRAISING

Because fresh raw sausages may require long cooking times, braising is often the preferred cooking method. The sausages are browned by sautéing them over moderate heat for up to 5 minutes, then finished using a moist-heat cooking method. Cooking with moisture may take any of several forms, including the four methods listed below. These methods are suitable not only for fresh sausages but also for fully cooked and smoked sausages that are served hot.

- Covering the pan to hold in steam.
- Adding a small amount of liquid (water, stock, wine, and so on), covering the pan, and cooking until done.
- Glazing—that is, adding a small amount of stock and continuing to cook. The pan may be covered or left uncovered at the beginning, but the last part of cooking takes place with the cover off. The sausages are basted with the stock as it reduces, giving them a glaze. Any stock remaining in the pan after the sausages are cooked will be reduced and thickened, and it may be served with the sausages as a sauce. This cooking method is especially suitable for patties and *crêpinettes*.
- Cooking the sausages in a casserole or stew after they are browned. Sauerkraut, bean dishes, and gumbos are examples.

BROILING AND GRILLING

Brush the sausages with oil to prevent sticking, and broil or grill as for other meats. Moderate heat is usually best. High heat may brown the sausages too much before they are fully cooked, and it is more likely to cause splitting.

About the Sausage Recipes

Before proceeding to the sausage recipes that follow, please take note of the following points.

1. Refer to the general procedures for making sausages on pages 864–865. Some of these points are not repeated in each recipe.
2. Ratios of fat to lean are not specified in most of the recipes. Refer to the explanation of fat-lean ratios on page 860 and adjust the amount of fat in the recipes as desired.

KEY POINTS TO REVIEW

- What are the three basic categories of sausages?
- What are the main ingredients of sausages?
- What are the steps in the procedure for preparing natural sausage casings?
- What are the steps in the procedure for making basic grind sausages?
- What are the steps in the procedure for making emulsified sausages?

Quatre Épices I

YIELD: 1¼ OZ (37 G)

U.S.	METRIC	INGREDIENTS
4 tbs	25 g	Ground white or black pepper
2 tsp	4 g (10 mL)	Nutmeg
2 tsp	4 g (10 mL)	Ground cloves
2 tsp	4 g (10 mL)	Cinnamon

PROCEDURE

1. Combine the ingredients and mix well.
2. Store in a tightly sealed container.

Per 1 ounce (28.35 g): Calories, 90; Protein, 3 g; Fat, 2 g (13% cal.); Cholesterol, 0 mg; Carbohydrates, 19 g; Fiber, 8 g; Sodium, 10 mg.

Quatre Épices II

YIELD: 1¼ OZ (34 G)

U.S.	METRIC	INGREDIENTS
10 tsp	20 g	Ground white pepper
3 tsp	6 g (15 mL)	Nutmeg
3 tsp	6 g (15 mL)	Ground ginger
1 tsp	2 g (5 mL)	Ground cloves

PROCEDURE

1. Combine the ingredients and mix well.
2. Store in a tightly sealed container.

Per 1 ounce (28.35 g): Calories, 100; Protein, 3 g; Fat, 3 g (21% cal.); Cholesterol, 0 mg; Carbohydrates, 18 g; Fiber, 7 g; Sodium, 5 mg.



Pork Sausage

YIELD: 6 LB (3 KG)

U.S.	METRIC	INGREDIENTS
6 lb	3 kg	Pork and pork fat
2 tbs	30 g	Salt
2 tsp	4 g (10 mL)	Quatre épices
6 fl oz	200 mL	Water, cold

PROCEDURE

1. Cut the meat and fat into cubes small enough to fit into the grinder. Chill thoroughly.
2. Grind the meat once with the large die and again with the small die. If necessary, chill the meat between grindings.
3. Mix the salt and spices with the water. Add to the ground meat and mix thoroughly by hand.
4. Stuff into hog casings or sheep casings.

Per 1 ounce (28.35 g): Calories, 70; Protein, 5 g; Fat, 5 g (69% cal.); Cholesterol, 20 mg; Carbohydrates, 0 g; Fiber, 0 g; Sodium, 160 mg.

VARIATIONS

Toulouse Sausage

Use the ingredients specified in the recipe, but grind the meat coarsely. This can be done in three ways, with slightly different results for each method:

1. Chop the meat coarsely with a knife.
2. Grind only once, using the large die of the grinder.
3. Grind briefly in a food processor, just until achieving a coarse texture.

Stuff into hog casings.

Toulouse sausages should have a fat content of at least 33 percent—that is, 1 part fat to 2 parts lean.

Crêpinettes

Weigh out 3½-oz (100-g) portions of sausage meat. Shape them into oval patties. Cut squares of caul fat (p. 303) and wrap the sausage portions in the squares. Cook by pan-frying, glazing (see p. 866), or grilling.

Other ingredients are often mixed with the sausage meat. Classic additions include blanched, peeled pistachios (2–3 oz per lb sausage meat/125–175 g per kg); chopped, cooked chestnuts (4 oz per lb/250 g per kg); or fresh, diced truffle (whatever quantity the budget allows).

Other sausage mixtures, such as those in the other recipes in this section, may be used to make crêpinettes.

French Garlic Sausage

YIELD: 7 LB (3.5 KG)

U.S.	METRIC	INGREDIENTS
6 lb	3 kg	Pork and pork fat
1 lb	500 g	Pork rind (skin)
2 tbsps	30 g	Salt
1½ tsp	3 g (7 mL)	Black pepper
2 tsp	8 g	Crushed garlic
½ tsp	2 mL	Ground sage
½ tsp	2 mL	Dried marjoram
½ tsp	2 mL	Dried thyme
4 fl oz	125 mL	Dry white wine

Per 1 ounce (28.35 g): Calories, 70; Protein, 5 g; Fat, 5 g (69% cal.); Cholesterol, 20 mg; Carbohydrates, 0 g; Fiber, 0 g; Sodium, 150 mg.

PROCEDURE

1. Cut the meat and fat into cubes small enough to fit into the grinder. Chill thoroughly.
2. Simmer the pork rind in salted water at least 2 hours, or until very tender. Chill thoroughly.
3. Grind the meat once with the large die and again with the medium die. If necessary, chill the meat between grindings.
4. Repeat this grinding procedure with the pork rind. Mix the ground pork rind with the ground meat.
5. Mix the salt and spices with the wine. Add to the ground meat and mix thoroughly by hand.
6. Stuff into hog casings.

Hot Italian Sausage

YIELD: 6 LB (3 KG)

U.S.	METRIC	INGREDIENTS
6 lb	3 kg	Pork and pork fat
2 tbsps	30 g	Salt
2 tsp	10 mL	Black pepper
2 tsp	10 mL	Fennel seeds
4 tsp	20 mL	Paprika
2 tsp	10 mL	Crushed red pepper
1 tsp	5 mL	Ground coriander
2 tsp	10 mL	Sugar
6 fl oz	200 mL	Water, cold

Per 1 ounce (28.35 g): Calories, 70; Protein, 5 g; Fat, 5 g (69% cal.); Cholesterol, 20 mg; Carbohydrates, 0 g; Fiber, 0 g; Sodium, 160 mg.

PROCEDURE

1. Cut the meat into cubes small enough to fit into the grinder. Chill the meat thoroughly.
2. Grind once with the medium die.
3. Mix the salt and spices with the cold water. Add to the ground meat and mix thoroughly by hand.
4. Stuff into hog casings.

VARIATIONS

Mild Italian Sausage

Omit the paprika, crushed red pepper, and coriander.

Spicy Garlic Sausage

Omit the fennel and coriander. Add 2 tsp (10 mL) dried oregano and 1–2 tsp (5–10 mL) chopped garlic.

Veal or Beef Sausage

YIELD: 6 LB (3 KG)

U.S.	METRIC	INGREDIENTS
4 lb	2 kg	Pork and pork fat
2 lb	1 kg	Veal or beef, lean
2 tbsps	30 g	Salt
2 tsp	4 g (10 mL)	Quatre épices
6 fl oz	200 mL	Water, cold

Per 1 ounce (28.35 g): Calories, 60; Protein, 5 g; Fat, 4 g (64% cal.); Cholesterol, 20 mg; Carbohydrates, 0 g; Fiber, 0 g; Sodium, 170 mg.

PROCEDURE

1. Cut the meat into cubes small enough to fit into the grinder. Chill the meat thoroughly.
2. Grind the meat once with the large or medium die for coarse sausage. For a finer texture, grind once more with the small die. If necessary, chill the meat between grindings.
3. Mix the salt and spices with the water. Add to the ground meat and mix thoroughly by hand.
4. Stuff into hog casings.

VARIATIONS

Instead of the meat ratios given in the main recipe, use 3 lb (1.5 kg) pork and pork fat and 3 lb (1.5 kg) veal or beef. These proportions make a somewhat leaner sausage with more of the flavor of the veal or beef.

Venison Sausage

Prepare as in the basic recipe or the first variation, substituting venison for the veal or beef. Add 4 juniper berries, crushed to a powder, to the spice mixture. Substitute chilled red wine for the cold water.

Fresh Bratwurst

YIELD: 6 LB (3 KG)

U. S.	METRIC	INGREDIENTS
6 lb	3 kg	Pork and pork fat
2 tbsp	30 g	Salt
3 tsp	15 mL	White pepper
¼ tsp	1 mL	Mace
1 tsp	5 mL	Ground coriander
½ tsp	2 mL	Ground ginger
6 fl oz	200 mL	Water, cold

Per 1 ounce (28.35 g): Calories, 70; Protein, 5 g; Fat, 5 g (69% cal.); Cholesterol, 20 mg; Carbohydrates, 0 g; Fiber, 0 g; Sodium, 160 mg.

PROCEDURE

1. Cut the meat and fat into cubes small enough to fit into the grinder. Chill thoroughly.
2. Grind the meat once with the large die and again with the small die. If necessary, chill the meat between grindings.
3. Mix the salt and spices with the water. Add to the ground meat and mix thoroughly by hand.
4. Stuff into hog casings.

VARIATION

Following the procedure on page 865, make an emulsified grind instead of a basic grind. Omit the water indicated in the recipe and add 12 oz (400 g) ice as indicated in the procedure.

Lamb Sausage

YIELD: 6 LB (3 KG)

U. S.	METRIC	INGREDIENTS
6 lb	3 kg	Lamb shoulder (see Note)
2 tbsp	30 g	Salt
4 tsp	20 mL	Chopped garlic
2 tbsp	30 mL	Paprika
1 tsp	5 mL	Cayenne
1 tsp	5 mL	Black pepper
2 tbsp	30 mL	Ground cumin
2 tsp	10 mL	Dried oregano
1 tsp	5 mL	Cinnamon
4 tbsp	60 mL	Chopped cilantro
6 fl oz	200 mL	Water, cold

Per 1 ounce (28.35 g): Calories, 80; Protein, 5 g; Fat, 6 g (73% cal.); Cholesterol, 20 mg; Carbohydrates, 0 g; Fiber, 0 g; Sodium, 160 mg.

Note: Include some fat with the lean or, if desired, include some pork fat. If pork fat is used, the finished sausage must be cooked to the well-done stage. If all lamb is used, the sausage may be served slightly rare.

PROCEDURE

1. Cut the meat and fat into cubes small enough to fit into the grinder. Chill thoroughly.
2. Grind the meat once with the medium die.
3. Mix the salt and spices with the water. Add to the ground meat and mix thoroughly by hand.
4. Stuff into hog casings.

VARIATIONS

For a simpler, more straightforward flavor, omit the oregano, cinnamon, and cilantro.

Herbed Lamb Sausage

The flavor of the sausages made by the main recipe is characteristic of the Middle East and parts of North Africa. For a lamb sausage of a more European or North American character, omit the paprika, cumin, oregano, cinnamon, and cilantro. Add 2 tsp (10 mL) dried thyme, 2 tsp (10 mL) dried rosemary, and 1 oz (30 g) chopped shallot.

Duck Sausage

YIELD: 6 LB (3 KG)

U. S.	METRIC	INGREDIENTS
6 lb	3 kg	Boneless duck meat and fat
2 tbsp	30 g	Salt
2 tsp	10 mL	Quatre épices
6 oz	185 g	Pine nuts, toasted, or pistachios, blanched and peeled
6 oz	185 g	Marinated sun-dried tomatoes, drained and chopped
½ tsp	2 mL	Dried thyme

Per 1 ounce (28.35 g): Calories, 160; Protein, 3 g; Fat, 17 g (91% cal.); Cholesterol, 25 mg; Carbohydrates, 1 g; Fiber, 0 g; Sodium, 160 mg.

PROCEDURE

1. Cut the meat and fat into cubes small enough to fit into the grinder. Chill thoroughly.
2. Grind the meat once with the medium die.
3. Mix the salt, spices, nuts, and sun-dried tomatoes. Add to the ground meat and mix thoroughly by hand.
4. Stuff into small hog casings.

Boudin Blanc (White Sausage)



YIELD: 7 LB (3.6 KG)

U.S.	METRIC	INGREDIENTS	PROCEDURE
1 lb 8 oz	750 g	Chicken breast, boneless and skinless	<ol style="list-style-type: none"> 1. Cut the chicken, pork, and fat into cubes small enough to fit into the grinder. Combine the chicken with the lean pork, but keep the pork fat separate. 2. Grind the meat once with the large die, then once with the small die. Chill. 3. Grind the fat once with the large die, then once with the small die. Chill.
2 lb	1 kg	Lean white pork	
1 lb 8 oz	750 g	Pork fat	
12 oz	375 g	Onion, chopped	<ol style="list-style-type: none"> 4. Simmer the onions in the milk until they are tender. Pour this mixture over the bread crumbs in a bowl. Cool, then set in the freezer until partly frozen. 5. Place the ground meat in the bowl of a food chopper or food processor. Chop a few seconds, then add the partially frozen milk mixture. Grind until the mixture is uniformly blended.
1 pt	500 mL	Milk	
8 oz	250 g	Fresh bread crumbs	
4	4	Eggs	<ol style="list-style-type: none"> 6. Beat together the eggs, salt, pepper, mace, and parsley (if used). Add to the meat in the grinder and continue to grind to a smooth paste. Check the temperature to make sure it does not rise above 50°F (10°C). If necessary, chill before continuing. 7. Add the fat to the grinder and continue to grind until the mixture is smooth and uniform. Do not let the temperature rise above 58°F (14°C). 8. Stuff into hog casings. 9. Poach the sausages by simmering them slowly in water until cooked through, about 20 minutes. Drain and plunge into ice water to cool. Drain again and refrigerate.
3 tbsp	45 mL	Salt	
2 tsp	10 mL	White pepper	
½ tsp	2 mL	Mace	
1 oz	30 g	Parsley, chopped (optional)	
<p>Per 1 ounce (28.35 g): Calories, 90; Protein, 4 g; Fat, 7 g (72% cal.); Cholesterol, 25 mg; Carbohydrates, 2 g; Fiber, 0 g; Sodium, 210 mg.</p>			

VARIATIONS

Other white meats, such as veal or rabbit, can be used instead of chicken.

Mortadella

YIELD: 5 LB (2.4 KG)

U. S.	METRIC	INGREDIENTS	PROCEDURE
2 lb 8 oz	1.2 kg	Pork, lean	1. Cut the pork into cubes small enough to fit into the grinder.
1 tsp	5 mL	Prague Powder #1	2. Toss the meat with the Prague Powder, salt, and wine, and refrigerate several hours or overnight.
5 tsp	25 mL	Salt	3. Cut the pork fat into cubes. Refrigerate several hours or overnight.
1½ fl oz	45 mL	Dry white wine	
1 lb 6 oz	660 g	Firm pork fat, such as fatback	
		Garnish:	4. Prepare the garnish. Cut the fatback into small dice. Blanch in boiling water 2 minutes. Drain. Refrigerate.
6 oz	180 g	Pork fatback	5. Pick over the pistachios to be sure they are all peeled and in good condition.
2 oz	60 g	Pistachios, peeled	
14 oz	400 g	Ice	6. Grind the lean pork using the small die of the grinder. Place it in a food chopper.
1½ tsp	7 mL	White pepper	7. Grind the fat from step 3 (not the fat for the garnish) through the small die and set it aside. Refrigerate it if the kitchen is warm, even though you will be using it in a few minutes.
1½ tsp	7 mL	Paprika	8. Start the food chopper and run a few seconds. Add the ice, the spices, and the milk powder and continue to chop the meat to a fine paste. Check the temperature of the meat. Do not let it rise above 50°F (10°C).
1 tsp	5 mL	Mace	9. Add the ground fat and continue to run the chopper. Stop the machine from time to time and stir briefly by hand if necessary for even mixing. Process to a fine, uniform paste. Do not let the temperature rise above 58°F (14°C).
1 tsp	5 mL	Quatre épices	10. Remove the meat mixture from the chopper and place in a stainless-steel bowl set over ice. Add the garnish (diced pork and pistachios) and mix into the meat purée.
1 tsp	5 mL	Ground coriander	11. Stuff into large beef casings or artificial casings.
¼ tsp	1 mL	Ground cloves	12. Allow to dry several hours in the refrigerator. This step is not essential, but it gives the sausage time to take on the desired pink color.
2 oz	60 g	Nonfat dry milk powder	13. Poach the sausage in water over very low heat, using a thermometer to ensure the temperature of the water stays at 165°F (74°C). Cook until the internal temperature of the sausage reaches 152°F (67°C).
			14. Remove the sausage from the cooking water and cool it in 2 steps. First, place it in room-temperature water 5–10 minutes. Next, place it a tub of cold running water until completely cooled.
			15. Refrigerate.

Per 1 ounce (28.35 g): Calories, 110; Protein, 4 g; Fat, 10 g (82% cal.); Cholesterol, 15 mg; Carbohydrates, 1 g; Fiber, 0 g; Sodium, 190 mg.

VARIATION

Bologna

Omit the garnish of diced fat and pistachios. Omit the wine. After stuffing the casings and drying the sausage, hot smoke at 165°F (74°C) for 1 hour. Remove from the smoker and immediately poach as in the basic recipe.

Cajun-Style Sausage

YIELD: 6 LB (3 KG)

U.S.	METRIC	INGREDIENTS
6 lb	3 kg	Pork and pork fat
1¼ tsp	6 mL	Prague Powder #1
2 tsp	10 mL	Salt
1 tsp	5 mL	Sugar
4 fl oz	125 mL	Water, cold

4 tsp	20 mL	Salt
4 tsp	20 mL	Crushed garlic
1 tbsp	15 mL	Black pepper
1 tsp	5 mL	Cayenne
1 tsp	5 mL	Ground bay leaf
½ tsp	2 mL	Ground cumin
1 tsp	5 mL	Chili powder
1 tbsp	15 mL	Paprika

Per 1 ounce (28.35 g): Calories, 70; Protein, 5 g; Fat, 5 g (69% cal.); Cholesterol, 20 mg; Carbohydrates, 0 g; Fiber, 0 g; Sodium, 190 mg.

VARIATION

Andouille

Prepare the sausage meat as in the basic recipe, but omit the seasonings added in step 5, substituting the seasonings and quantities listed below. Cold smoke 12 hours. After smoking, again hang the sausages in the refrigerator, if possible, or arrange on towel-covered sheet pans so they are not touching each other. Allow to cure another 24 hours in the refrigerator.

4 tsp	20 mL	Salt
3 tbsp	50 mL	Crushed garlic
1 tsp	5 mL	Black pepper
1 tbsp	15 mL	Cayenne
¼ tsp	1 mL	Ground bay leaf
1 tsp	5 mL	Paprika
½ tsp	2 mL	Dried thyme
½ tsp	2 mL	Dried ground sage
½ tsp	2 mL	Mace
½ tsp	2 mL	Ground allspice

PROCEDURE

1. Cut the pork and fat into cubes.
2. Mix together the Prague Powder, salt, and sugar.
3. Add this mixture and the water to the diced meat and fat and mix well. Refrigerate several hours.
4. Grind the meat mixture using the large die.
5. Add the remaining ingredients to the meat and mix thoroughly.
6. Stuff into large hog casings
7. Hang the sausages in the refrigerator, if possible, or arrange on towel-covered sheet pans so they are not touching each other. Refrigerate 24 hours to dry the sausages before smoking.
8. Cold smoke at 80°F (27°C) for 4 hours.
9. At this point, the sausages are still raw and should be treated the same way as fresh sausages. They may be sold this way but must be cooked (by poaching, sautéing, grilling, etc.) before being eaten. Alternatively, they may be poached to an internal temperature of 152°F (67°C) immediately after smoking.

Smoked Garlic Sausage

YIELD: 5 LB 12 OZ (2750 G)

U. S.	METRIC	INGREDIENTS	PROCEDURE
6 lb	3 kg	Pork and pork fat	1. Cut the pork and fat into cubes.
1¼ tsp	6 mL	Prague Powder #1	2. Mix together the Prague Powder, salt, and sugar.
5 tsp	25 mL	Salt	3. Add this mixture to the diced meat and fat and mix well. Refrigerate several hours.
1 tsp	5 mL	Sugar	
1 tsp	5 mL	White pepper	4. Grind the meat mixture using the medium die.
1 tsp	5 mL	Quatre épices	5. Add the remaining ingredients to the meat and mix thoroughly.
2 tsp	10 mL	Crushed garlic	6. Stuff into large hog casings.
6 fl oz	180 mL	Dry white wine or water	7. Hang the sausages in the refrigerator, if possible, or arrange on towel-covered sheet pans so they are not touching each other. Refrigerate 24 hours to dry the sausages before smoking.
<p>Per 1 ounce (28.35 g): Calories, 70; Protein, 5 g; Fat, 5 g (68% cal.); Cholesterol, 20 mg; Carbohydrates, 0 g; Fiber, 0 g; Sodium, 170 mg.</p>			8. Hot smoke at 160°F (71°C) for 1½ hours, then poach in water at 165°F (74°C) until the internal temperature is 152°F (67°C).
<p>VARIATIONS</p> <p>For a darker color and heavier smoke flavor, leave the sausages in the hot smoke until their internal temperature is 152°F (67°C), and do not poach them. Spray them with cold water after removing them from the smoker to keep them from shriveling.</p> <p>Cured Garlic Sausage Dry the sausages 24–48 hours (step 7). Omit the hot smoking and simply poach, cool, and refrigerate them as described in steps 8 and 9.</p>			9. Cool the sausages in cold water, then drain, dry, and refrigerate.

TERMS FOR REVIEW

charcutier	tinted curing mix (TCM)	sausage	natural casing
charcuterie	Prague Powder #2	fresh sausage	collagen casing
sodium nitrite	dry cure	cured sausage	basic grind
sodium nitrate	brine cure	smoked sausage	emulsified grind
nitrosamine	cold smoking	certified pork	emulsion grind
Prague Powder #1	hot smoking	quatre épices	progressive grinding

QUESTIONS FOR DISCUSSION

1. Explain how salt helps preserve meats.
2. Nitrites and nitrites are both used to cure meats. Explain how their use differs. Against which food-borne disease are they important in protecting cured foods?
3. Explain why smoked meats are cured before smoking.
4. Describe the basic differences between fresh, cured, and smoked sausages.
5. What are the four basic kinds of ingredients in sausage meat? List ways this basic formula can be changed to create different types of sausages.
6. Why should sausage meat be kept cold when it is being ground and processed?
7. Describe the procedure for preparing natural sausage casings for stuffing.