

SECTION 5.3 COOKING METHODS

Cooking is—simply put—the process of preparing food for eating. What is your favorite way to prepare potatoes, fish, or beef? There are a variety of cooking methods, each producing different results. To be a good chef, you must master the skill of choosing an appropriate method for each specific food.

The three general types of cooking methods are dry-heat cooking, moist-heat cooking, and combination cooking. Each method can be used to bring out the flavor and tenderness of specific dishes. In addition, these methods can reflect cultural and regional preferences.

Study Questions

After studying Section 5.3, you should be able to answer the following questions:

- How is heat transferred to food through conduction, convection, and radiation?
 - What are the types of cooking methods?
 - What is dry-heat cooking, and which foods are best suited for it?
 - What is moist-heat cooking, and which foods are best suited for it?
 - What is combination-heat cooking, and which foods are best suited for it?
 - How do you determine when food is done cooking?
 - What are the guidelines for plating and storing food that has finished cooking?
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Heat Transfer

Heat is a type of energy. When two items of different temperatures have contact, energy, in the form of heat, transfers from the warmer item to the cooler until they both reach the same temperature. Heat travels in items in three ways, as shown in Figure 5.27.

Conduction is the transfer of heat from one item to another when the items come into direct contact with each other. Sometimes the heat is transferred to the air or from surface to surface. An example is when a cold plate begins to warm when covered with hot food. The heat of the food is conducted into the surface of the plate.

Convection is the transfer of heat caused by the movement of molecules (in the air, water, or fat) from a warmer area to a cooler one. When heating water, natural convection occurs. As water heats at the bottom of the pan, it travels upward. In the process, it transfers energy to the cooler water higher in the pot. This is a continuous process, with the hot water constantly rising and replacing the cooling water. It also occurs as mechanical convection in a convection oven when hot air is forced into the chamber.

Radiation does not require physical contact between the heat source and the food being cooked. Instead, heat moves by way of microwave and infrared waves. **Infrared heat** is created when the heat from a source is absorbed by one material and then radiated out to the food. The flame in a broiler heats the tiles in the broiler, which radiate the heat to the food. Microwaves agitate the water molecules in the food, creating a form of friction that heats the water and thereby the food.

It is important to remember that infrared waves affect the exterior of the food. Heat on the outside of the food then spreads inward through conduction. The result is that the outside of the food browns. Microwaves penetrate the item and cook it from the inside out, so browning does not take place. Microwaving is good for some recipes, but many foods can quickly become tough and rubbery or dried out if microwaved too long.

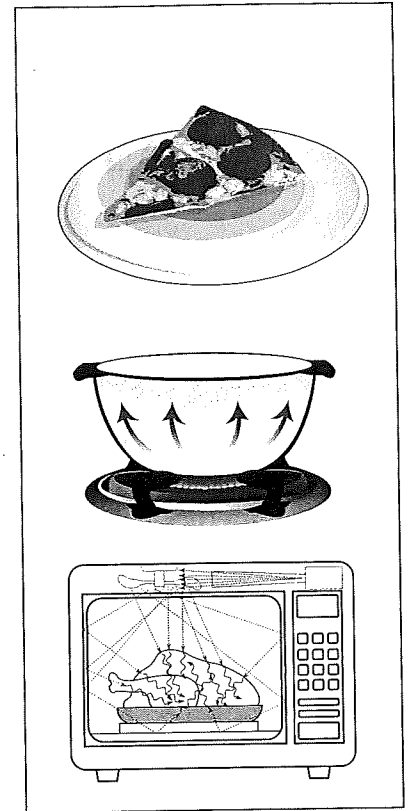


Figure 5.27: Heat patterns during conduction, convection, and radiation.

Dry-Heat Cooking Methods

In dry-heat cooking, food is cooked either by direct heat, like on a grill, or by indirect heat in a closed environment, like in an oven. Some food may lose moisture and become dry when cooked using dry heat. Any food prepared using dry heat must be naturally tender or prepared by adding moisture. There are several ways to add moisture:

- **Barding:** Wrapping an item (usually a naturally lean piece of meat, such as a pork tenderloin) with strips of fat before cooking to baste the meat, making it more moist
- **Larding:** Inserting long, thin strips of fat into a large, naturally lean piece of meat with a special needle before cooking to baste the meat from the inside
- **Marinating:** Soaking an item in a combination of wet and dry ingredients to provide flavor and moisture

Dry-heat cooking methods without fat include the following:

- Broiling
- Grilling
- Roasting
- Baking

Another way to prepare food is to use dry-heat cooking methods with fat and oil. These methods include the following:

- Sautéing
- Pan-frying
- Stir-frying
- Deep-frying

Broiling

Broiling is a rapid cooking method that uses high heat from a source located above the food. Broiled food becomes browned on the top. Foods that can be broiled include tender cuts of meat, young poultry, fish, and some fruits and vegetables.

Essential Skills

Broiling Food

- ① Preheat the broiler.
- ② Oil the broiler grill lightly or oil item lightly, if necessary.
- ③ Place the item on the broiler grid and move it into broiler cavity. See Figure 5.28a.
- ④ Adjust the distance between the item and the heat as needed to control the rate of cooking. Place the food farther away and cook it a little longer to reach a higher internal temperature in the finished product, and move it closer for less time for a lower internal temperature in the finished product. To cook red meat to a rare level, use shorter cooking times with more heat; for well-done use longer cooking times with less heat. Both should have a well-browned, flavorful crust on the outside and a juicy interior when finished. See Figure 5.28b.
- ⑤ Turn the item over halfway through the cooking process to achieve even cooking on both sides of the product. See Figure 5.28c.

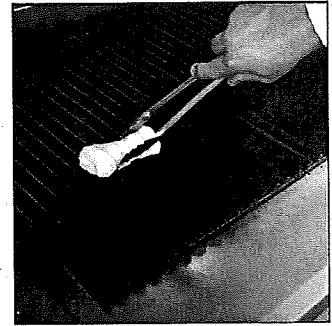


Figure 5.28a: Step 3— Move the item into the broiler cavity.

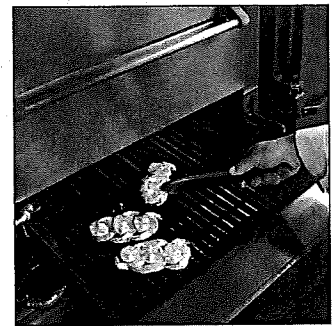


Figure 5.28b: Step 4— Place the food farther away.

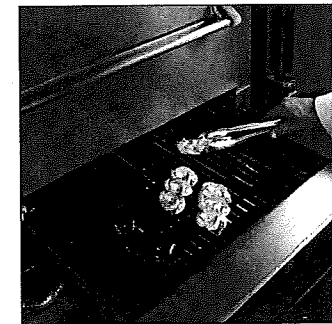


Figure 5.28c: Step 5—Turn the item halfway through the cooking process.

Grilling

Grilling is a very simple dry-heat method that is excellent for cooking smaller pieces of food. The food is cooked on a grill rack above the heat source. No liquid is added to the food during cooking. A cook might add small amounts of fat or oil during the cooking process simply to add flavor to the finished dish.

The result of grilling is food with a highly flavored outside and a moist inside. Grilled food has a smoky, slightly charred flavor because the fat melts and drips down into the heat source, along with some of the meat's juices. As the fat and

juices burn, the smoke helps provide the charred flavor. The crosshatching “look” common to grilled food comes from the hot metal grill rack that the food sits on. Special woods, such as mesquite, hickory, or apple, can be used in the heat source to flavor the grilled food. Using a marinade can give the food a unique flavor as well as make it more moist.

Essential Skills

Grilling Food

- ❶ Thoroughly clean and preheat the grill.
- ❷ Season the main item. Marinate or brush it with oil, if necessary, to prevent it from sticking to the grill. See Figure 5.29a.
- ❸ Place the item on the grill.
- ❹ Turn the item about 60 degrees to produce crosshatch marks. See Figure 5.29b.
- ❺ Flip the item over to complete cooking to the desired doneness.
- ❻ The finished product should be cooked to the desired doneness, golden brown with no burning or charring. Achieving this requires control of the heat source.

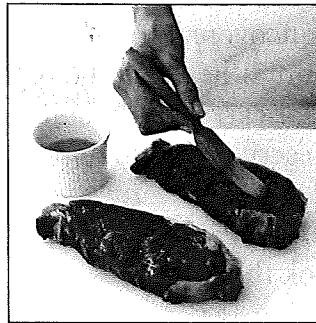


Figure 5.29a: Step 2—Season the item.

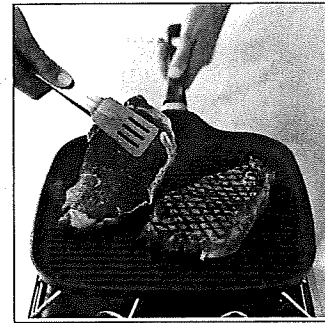


Figure 5.29b: Step 4—Turn the item 60 degrees to produce crosshatch marks.

Roasting

Roasting and **baking** are techniques that cook food by surrounding the items with hot, dry air in the oven. As the outer layers of the food become heated, the food’s natural juices turn to steam and are absorbed into the food. These juices create a natural sauce.

Bake food covered or uncovered, depending on the recipe. Food that is baked uncovered, such as cookies and casseroles, develop a golden brown color on top.

Roasting generally requires longer cooking times and is most often used with large cuts of meat, whole birds (poultry), or fish. Roasted food should have a golden brown exterior and moist, tender interior. Foods that can be baked or roasted include fish, tender meats and poultry, and some fruits and vegetables.

Essential Skills

Roasting Meat

- ① Season, stuff, or marinate the main item, and sear, or quickly brown, its surface over direct heat.
- ② Place the food on a rack in a roasting pan so that hot air can touch it on all sides. See Figure 5.30a.
- ③ Roast the item uncovered or covered, as the recipe calls for, until the desired temperature is reached. Allow for carryover cooking. **Carry-over cooking** describes what happens to food after it has been removed from the oven. The roasted item holds a certain amount of heat that continues to cook the food.
- ④ Allow the roasted item to sit or **rest** before carving. Doing this allows the juices, which are being drawn out to the edges of the meat during roasting, to return to the center of the item and make it juicier.
- ⑤ Prepare pan gravy in the roasting pan.
- ⑥ Carve the roasted item, and serve it with the appropriate gravy or sauce. See Figure 5.30b.

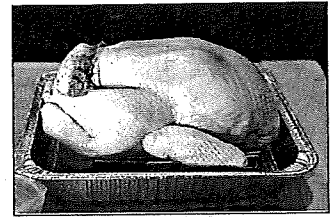


Figure 5.30a: Step 2— Place food on a rack in a roasting pan.

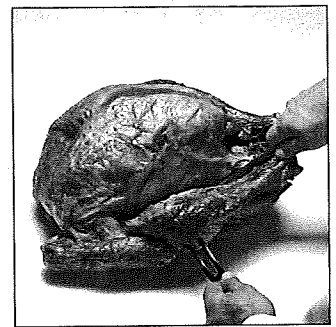


Figure 5.30b: Step 6— Carve the roasted item.

Griddling

Griddling is cooking a food item on a hot, flat surface (known as a griddle) or in a relatively dry, heavy-bottomed fry pan or cast-iron skillet. The goal is to give the product an even, golden brown finish and a slightly crisp exterior texture. When cooking meats on a high-heat griddle or in a cast-iron pan, the result is a high level of browning that gives the finished product a unique taste and texture not achieved with other cooking methods. In particular, steaks, chops, and chicken breasts are often cooked on a griddle or in a hot cast-iron skillet.

The griddle is also used to prepare one of the most popular breakfast menu items: griddle cakes (pancakes). To produce a quality product, clean the griddle well and make sure the temperature of the griddle surface is appropriate to the item being cooked.

Sautéing

The **sautéing** (saw-TAY-ing) method cooks food rapidly in a small amount of fat over relatively high heat. The fat adds to the flavor. Meat strips, chicken, and fish are often prepared this way. The thinner and more delicate the piece of meat, the faster it will cook.

The literal translation of the French term sauté is “jump.” To sauté is to cook the food quickly to keep water and vitamin loss at a low, while gaining a high degree of color and flavor. When sautéing, the pan is heated first, and just enough fat is added to coat the bottom of the pan.

Essential Skill

Sautéing

- ① Perform thorough *mise en place*.
- ② Cut food into appropriately sized pieces to allow maximum surface contact with the pan.
- ③ Select the correct pan:
 - a. Large enough to allow food to spread well in pan (overloading the pan does not allow rapid cooking)
 - b. Sides that slant outward to allow moisture vapors to easily escape
 - c. Made of a metal that provides good heat conductivity
- ④ Use high to medium heat that can be easily controlled.
- ⑤ Use minimal fat or clarified butter, just enough to prevent sticking and help conduct heat and flavor. See Figure 5.31a.
- ⑥ Preheat the pan and fat to a high temperature (but not burning).
- ⑦ Place a thin layer of food in the hot pan (overloading the pan drops the temperature of the pan too rapidly and items will not brown).
- ⑧ Allow food to remain in contact with the surface long enough to brown, but move it often enough to prevent burning. See Figure 5.31b.

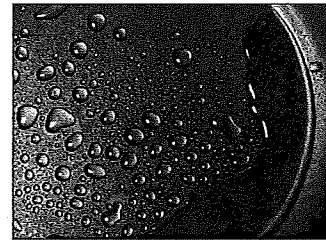


Figure 5.31a: Step 5—Use minimal fat to prevent sticking.

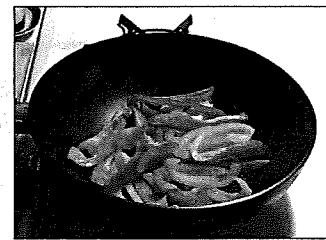


Figure 5.31b: Step 8—Keep food in contact with the surface of the pan to brown.

Stir-Fry

Stir-fry is a cooking method closely related to sauté. Like sauté, it is a quick-cooking, dry-heat method. Food is cooked over a very high heat, generally in a wok with little fat, and stirred quickly. In this Asian style of cooking, sauce is usually created in the same pan after the product has been “sautéed.”

In this method, a very small amount of oil is used in a pan over high heat. The items to be stir-fried, usually meats and fresh vegetables, are cut into bite-sized pieces. Figure 5.32 is an example of stir-fry cooking.

The wok, a bowl-shaped pan, makes stir-frying easy. A wok is usually made of rolled steel and is used for nearly all Chinese cooking methods.

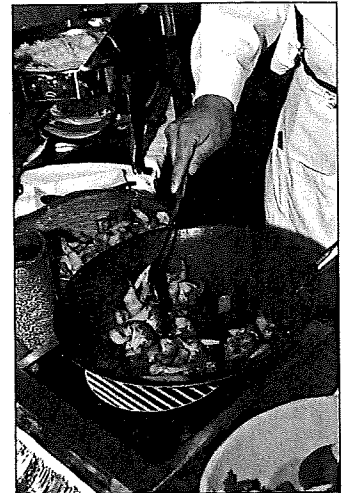


Figure 5.32: Stir-frying vegetables.

[fast fact]

Did You Know...?

Chopsticks are the second-most-popular eating tool in the world, after fingers. They originated in China sometime during the Shang Dynasty (1766–1122 BC). According to Confucius, knives represented aggression and therefore were not appropriate to use when dining. So, chopsticks became the utensil of choice.

Essential Skills

Steps for Stir-Frying

- 1 Perform thorough *mise en place*.
- 2 Heat a small amount of oil in a wok or large sauté pan. See Figure 5.33a.
- 3 Add the main item.
- 4 Stir-fry, keeping the food in constant motion with a wooden paddle or spoon. See Figure 5.33b.
- 5 Add additional ingredients, including seasonings, in the proper sequence (longest-cooking ingredient in first, shortest-cooking ingredient in last).
- 6 Add the liquid ingredients to the pan to create the sauce. Then add the thickener, as necessary.
- 7 Serve the food immediately.



Figure 5.33a: Step 2—Heat oil in a wok.

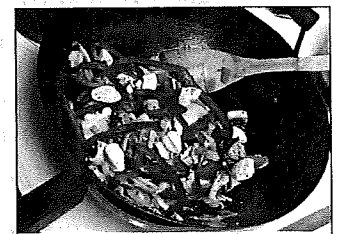


Figure 5.33b: Step 4—Stir-fry food.

Pan-Frying

Cooking techniques that use more fat than those discussed so far include pan-frying and deep-frying. To **pan-fry** food, cook it in an oil over less intense heat than that used for sautéing or stir-frying. Many recipes call for coating the food with batter, seasoned flour, or breading first. The hot oil seals the food's coated surface and locks the natural juices inside, instead of releasing them. The oil should be deep enough to come halfway up the side of the food being cooked. The object of pan-frying is to produce a flavorful exterior with a crisp, brown crust that helps retain the food's juices and flavor.

Only naturally tender food should be pan fried because this method of cooking brings out the food's distinct flavor and moistness. Even after cooking, the food should be tender and moist. Pan-fried food may be held for only a short time before being served. The outside of the food should be evenly golden brown, with a firm crust.

[ServSafe™ Connection]

Watch the Batter

Batters prepared with eggs or milk should be handled with care. There is a risk of time-temperature abuse and cross-contamination when batters are made with these products. Breading must also be handled with care because cross-contamination is a risk. If you make breaded or battered food from scratch, follow these guidelines:

- Prepare batters in small batches. Store what you do not need at 41°F or lower in a covered container.
- When breading food that will be cooked at a later time, store it in the refrigerator as soon as possible.
- Create a plan to throw out unused batter or breading after a set amount of time.
- Cook battered and breaded food thoroughly.

Essential Skills

Pan-Frying

- 1 Perform thorough *mise en place*.
- 2 Fill a fry pan half to two-thirds full with appropriate oil or fat.
- 3 Heat the cooking oil to about 350°F. (Oil that is too cool will result in excess oil absorption by the item, and oil that is too hot will burn the outside coating before the item is cooked.)
- 4 Add the food item (usually breaded, coated with seasoned flour, or batter-coated) to the pan in a single layer.
- 5 Pan-fry the food on the first side until it is well browned.
- 6 Turn the item and cook it to the desired doneness. (If the item is extremely thick it can be finished in the oven to prevent burning the crust.) See Figure 5.34.
- 7 Drain the item on absorbent paper.
- 8 Season and serve it with the appropriate sauce and garnish.

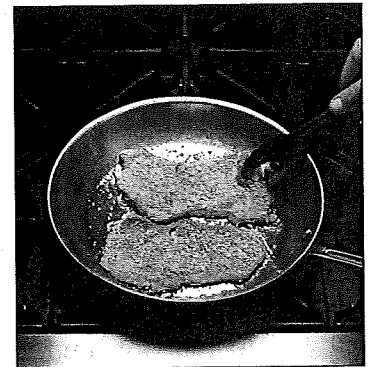


Figure 5.34: Step 6—Turn the item and cook to desired doneness.

To **deep-fry** food, bread or batter coat it, immerse (completely cover) it in hot fat, and fry it until it is done. The outside of the food item develops a crispy coating while the inside stays moist and tender. The coating on the food item can be a standard breading or a batter. A **batter** combines dry and wet ingredients. It is a mixture of the primary dry ingredient (wheat flour, all-purpose flour, corn meal, rice flour), the liquid (beer, milk, wine, water), and a binder (generally egg), which helps the mixture adhere to the product. Examples include the beer batter often used on fish, corn meal batter used on corn dogs, and tempura batter used on tempura vegetables and fish.

A **breading** has the same components as batter, but they are not blended together. A standard breading would be seasoned all-purpose flour and an egg and buttermilk dip. Place the product in the dip, remove, shake to remove excess dip, and then coat with the seasoned flour. For double-breading, repeat the process. If bread crumbs are an additional ingredient, submerge each item first in flour, then in egg and buttermilk, and then in crumbs.